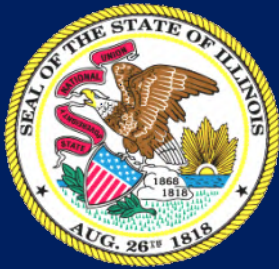

State of Illinois
Office of the Auditor General



State Actuary's Report of the

**Actuarial Assumptions and
Valuations of the State-
Funded Retirement Systems**

December 19, 2024

Frank J. Mautino
Auditor General

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OFFICE OF THE AUDITOR GENERAL
FRANK J. MAUTINO

To the Speaker and Minority Leader of the House of Representatives, the President and Minority Leader of the Senate, the members of the General Assembly, and the Governor:

This is our 2024 report on the actuarial assumptions and valuations of the State-funded retirement systems.

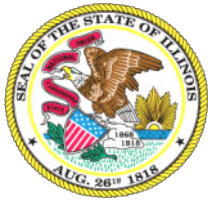
This report was conducted pursuant to Public Act 097-0694 which amended the Illinois State Auditing Act by adding a requirement for the Auditor General to annually review assumptions and valuations prepared by the actuaries of the five State-funded retirement systems. In addition, Public Act 100-0465 added a similar requirement to review the Public School Teachers' Pension and Retirement Fund of Chicago. The report is based on reports prepared by Cheiron, the State Actuary, on each of the State-funded retirement systems.

The report is transmitted in conformance with Section 5/2-8.1(c) of the Illinois State Auditing Act.

SIGNED ORIGINAL ON FILE

FRANK J. MAUTINO
Auditor General

Springfield, Illinois
December 2024



State Actuary's Report of the Actuarial Assumptions and Valuations of the State-Funded Retirement Systems

Background:

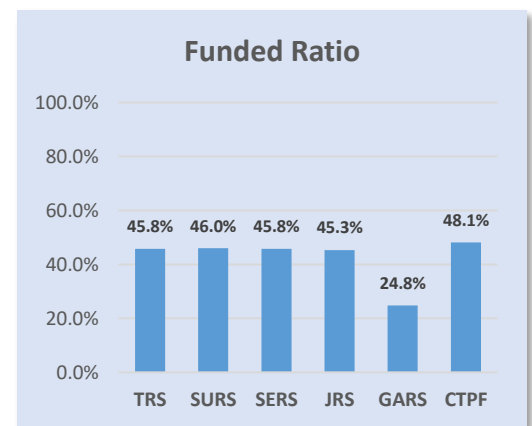
On June 18, 2012, Public Act 097-0694 was signed into law, which directed the Auditor General to contract with or hire an actuary to serve as the State Actuary. Cheiron was selected as the State Actuary. The Public Act directed the State Actuary to:

- Review assumptions and valuations prepared by actuaries of the State-funded retirement systems;
- Issue preliminary reports to the boards of trustees of the State-funded retirement systems concerning proposed certifications of required State contributions; and
- Identify recommended changes to actuarial assumptions that the boards must consider before finalizing their certifications of the required State contributions.

On August 31, 2017, Public Act 100-0465 was signed into law, which added a sixth retirement system to be reviewed by the State Actuary. The Illinois Pension Code was revised to require the Chicago Teachers' Pension Fund (CTPF) to submit information to the State Actuary similar to the requirement for the other State-funded retirement systems.

Key Findings:

- The State Actuary, Cheiron, reviewed the actuarial assumptions used in each of the six systems' actuarial valuations for the year ended June 30, 2024, and **concluded that they generally were reasonable**. Cheiron **did not recommend any changes** to the assumptions used in the June 30, 2024 actuarial valuations.
- The combined total of the required Fiscal Year 2025 State contribution for the six retirement systems was **\$11.94 billion, an increase of \$0.19 billion over the previous year**. Cheiron verified the arithmetic calculations made by the systems' actuaries to develop the required State contribution and reviewed the assumptions on which it was based.
- The Illinois Pension Code (for TRS, SURS, SERS, JRS, and GARS) establishes **a method that does not adequately fund the systems**. It requires the actuary to calculate the employer contribution as the level percentage of projected payroll that would accumulate assets equal to 90% of the actuarial accrued liability in the year 2045 if all assumptions are met. This methodology does not conform to generally accepted actuarial principles and practices. Generally accepted actuarial funding methods target the accumulation of assets equal to 100% of the actuarial liability, not 90%.
- According to the systems' 2024 actuarial valuation reports, the funded ratio of the retirement systems ranged from 48.1% (CTPF) to 24.8% (GARS), based on the actuarial value of assets as a ratio to the actuarial liability. If there is a significant market downturn, the unfunded actuarial liability and the required State contribution rate could both increase significantly, putting the sustainability of the systems further into question.



- The interest rate assumption (also called the investment return or discount rate) is the most impactful assumption affecting the required State contribution amount. The retirement systems use varying interest rate assumptions ranging from 6.50 percent to 7.00 percent. The interest rate assumption remained unchanged for each of the systems for the 2024 actuarial valuations.

- One of the historical sources of the increase in unfunded actuarial liability is due to actual contributions to the System being less than the tread water contribution (the amount needed to prevent the unfunded actuarial liability from increasing if all assumptions are met). Actual contributions have been significantly less than the tread water cost. Each year that total contributions remain below the tread water cost, the unfunded actuarial liability is expected to grow.

Key Recommendations:

Cheiron recommended changes for both the 2024 valuations and also changes for future valuations. This year's report contains 26 recommendations compared to 33 in last year's report. Recommendations included the following:

- Cheiron recommends that the funding method be changed to employ a methodology that produces a reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.
- Cheiron recommends the Boards continue to annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work and adjust assumptions accordingly. All of the systems complied with this recommendation prior to conducting the 2024 actuarial valuations.
- Because experience studies are performed every three years, Cheiron recommended that the phase-in period for the impact of assumption changes be reduced to no longer than three years.
- Cheiron assessed compliance with Actuarial Standard of Practice 51 (assessment and disclosure of risk). Several recommendations in this area were implemented by the systems and not repeated in this year's report. However, there was one recommendation directed to TRS. Cheiron recommended the actuary provide an assessment for each of the key risks identified.
- Cheiron also assessed compliance with Actuarial Standard of Practice 4 (measuring pension obligations and determining costs) and recommended the TRS actuary disclose how long before the State Mandated Contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability.
- In future economic assumption studies, Cheiron recommends that the plan's actuary disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received. This recommendation was directed to four of the systems (SERS, JRS, GARS, and CTPF).

This annual review was conducted by Cheiron, the State Actuary, with the assistance of the staff of the Office of the Auditor General.

Background

On June 18, 2012, Public Act 097-0694 was signed into law, which directed the Auditor General to contract with or hire an actuary to serve as the State Actuary. The Public Act amended the Illinois State Auditing Act as well as sections of the Illinois Pension Code for each of the following State-funded retirement systems:

- The Teachers’ Retirement System (TRS);
- The State Universities Retirement System (SURS);
- The State Employees’ Retirement System (SERS);
- The Judges’ Retirement System (JRS); and
- The General Assembly Retirement System (GARS).

Requirements of Public Act 097-0694

Public Act 097-0694 requires the State Actuary to conduct an annual review of the valuations prepared by the actuaries of the State-funded retirement systems. Specifically the Act requires the State Actuary to:

- Review assumptions and valuations prepared by actuaries retained by the boards of trustees of the State-funded retirement systems;
- Issue preliminary reports to the boards of trustees of the State-funded retirement systems concerning proposed certifications of required State contributions submitted to the State Actuary by those boards; and
- Identify recommended changes to actuarial assumptions that the boards must consider before finalizing their certifications of the required State contributions.

On or before November 1 of each year, beginning November 1, 2012, the boards of each of the systems must submit to the State Actuary a proposed certification of the amount of the required State contribution to the system for the next fiscal year, along with all of the actuarial assumptions, calculations, and data upon which that proposed certification is based.

On or before January 1, 2013, and each January 1 thereafter, the Auditor General shall submit a written report to the General Assembly and Governor documenting the initial assumptions and valuations prepared by actuaries retained by the boards of trustees of the State-funded retirement systems, any changes recommended by the State Actuary in the actuarial assumptions, and the responses of each Board to the State Actuary's recommendations.

On or before January 15, 2013, and every January 15 thereafter, each Board shall certify to the Governor and the General Assembly the amount of the required State contribution for the next fiscal year. The Boards’ certification must note any deviations from the State Actuary's recommended changes, the reason or reasons for not following the State Actuary's recommended changes, and the

fiscal impact of not following the State Actuary's recommended changes on the required State contribution.

Requirements of Public Act 100-0465

On August 31, 2017, Public Act 100-0465 was signed into law, which added a sixth retirement system to be reviewed by the State Actuary. The Illinois Pension Code was revised to require the Chicago Teachers’ Pension Fund (CTPF) to submit information to the State Actuary similar to the requirement for the other State-funded retirement systems. Public Act 100-0465 specified the following regarding the Chicago Teachers’ Pension Fund:

- For State fiscal year 2018, the State shall contribute \$221,300,000 for the employer normal cost.
- Beginning in State fiscal year 2019, the State shall contribute an amount equal to the employer normal cost for that fiscal year.
- On or before November 1 of each year, beginning November 1, 2017, the Board shall submit to the State Actuary, the Governor, and the General Assembly a proposed certification of the amount of the required State contribution to the Fund for the next fiscal year, along with all of the actuarial assumptions, calculations, and data upon which that proposed certification is based.
- On or before January 1 of each year, beginning January 1, 2018, the State Actuary shall issue a preliminary report concerning the proposed certification and identifying, if necessary, recommended changes in actuarial assumptions that the Board must consider before finalizing its certification of the required State contributions.
- On or before January 15, 2018, and each January 15 thereafter, the Board shall certify to the Governor and the General Assembly the amount of the required State contribution for the next fiscal year. The Board's certification must note any deviations from the State Actuary's recommended changes, the reason or reasons for not following the State Actuary's recommended changes, and the fiscal impact of not following the State Actuary's recommended changes on the required State contribution.

Contracting with the State Actuary

On July 12, 2012, the Office of the Auditor General issued a Request for Proposals for the services of a State Actuary. On August 24, 2012, the contract was awarded to Cheiron. Cheiron is a full-service actuarial and consulting firm with offices in eight locations throughout the United States. Cheiron has experience working with multiple public pension plans around the country.

Review of the Actuarial Assumptions

Cheiron reviewed the actuarial assumptions used in each of the six systems’ actuarial valuations for the year ended June 30, 2024, and **concluded that they were reasonable. Cheiron did not recommend any changes to the assumptions used in the June 30, 2024 actuarial valuations.**

Cheiron did recommend changes for both the 2024 valuations and also changes for future valuations. The systems’ responses to Cheiron’s preliminary reports can be found in Appendix D of this report.

Digest Exhibit 1 summarizes the recommendations made to the retirement systems. At the end of each of the reports located in chapters one through six is a chart summarizing the status of recommendations made by the State Actuary in last year’s 2023 report. This year’s report contains 26 recommendations compared to 33 recommendations made in last year’s report.

In a new recommendation, Cheiron recommended, in future economic assumption studies, the plan’s actuary disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received. Disclosing the names of the investment consulting firms that participated in the survey will provide added transparency and the ability to review how each firm’s expectations have changed year to year. This recommendation was directed to four of the systems (SERS, JRS, GARS, and CTPF).

The following sections discuss some of the key assumptions and recommendations. Further details on the assumptions and recommendations are contained in the chapters for each of the retirement systems.

Digest Exhibit 1
RECOMMENDATIONS TO THE RETIREMENT SYSTEMS

Recommendations	TRS	SURS	SERS	JRS	GARS	CTPF
Recommended Changes to Actuarial Assumptions used in the 2024 Actuarial Valuations:						
Cheiron reviewed the actuarial assumptions and concluded that they were reasonable. Consequently, Cheiron did not have any recommended changes to assumptions this year.						
Recommended Changes for the 2024 Actuarial Valuations:						
• Related to ASOP 51, provide an assessment for each of the key risks identified	✓					
• Disclose how long before the State Mandated Contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability	✓					
Recommended Changes for Future Actuarial Valuations:						
• Annually review the economic assumptions (interest rate and inflation rate) and adjust assumptions accordingly	✓	✓	✓	✓	✓	✓
• Provide additional information about the projected demographics of the active population used in its projections such as the average age and service of the population each year	✓					
• Include additional detail by the relevant age and/or service buckets throughout the experience study	✓					
• Provide a rationale for the significant expected increase in administrative expenses compared to the most recent actual administrative expenses	✓					
• In future economic assumption studies, disclose more information about the survey data used in the analysis			✓	✓	✓	✓
• Include annual opt-out data in the Active Membership table					✓	
Other Recommendations:						
• Change the funding method to employ a methodology that produces a reasonable Actuarially Determined Contribution and fully fund plan benefits within a reasonable period	✓	✓	✓	✓	✓	
• Reduce the phase-in period for the impact of assumption changes to no longer than three years	✓	✓	✓	✓	✓	

Source: OAG summary of Cheiron’s preliminary reports to the six retirement systems.

Economic Assumptions

Cheiron reviewed the economic assumptions utilized in the actuarial valuations for each of the six retirement systems. The following sections discuss two of those assumptions – the interest rate assumption and the inflation assumption.

Interest Rate Assumption

The interest rate assumption (also called the investment return or discount rate) is **the most impactful assumption affecting the required State contribution amount**. This assumption is used to value liabilities for funding purposes. The

retirement systems use varying interest rate assumptions. Digest Exhibit 2 shows the interest rate assumptions for each of the six retirement systems for every year since 2014. As can be seen in the exhibit, the interest rate assumption remained unchanged for each of the systems for the 2024 actuarial valuations.

Digest Exhibit 2
INTEREST RATE ASSUMPTIONS

System	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TRS	7.50%	7.00%									
SURS	7.25%			6.75%			6.50%				
SERS	7.25	7.00%			6.75%						
JRS	7.00%	6.75%			6.50%						
GARS	7.00%	6.75%			6.50%						
CTPF	7.75%		7.25%	7.00%	6.75%	6.50%					

Source: Retirement system actuarial reports.

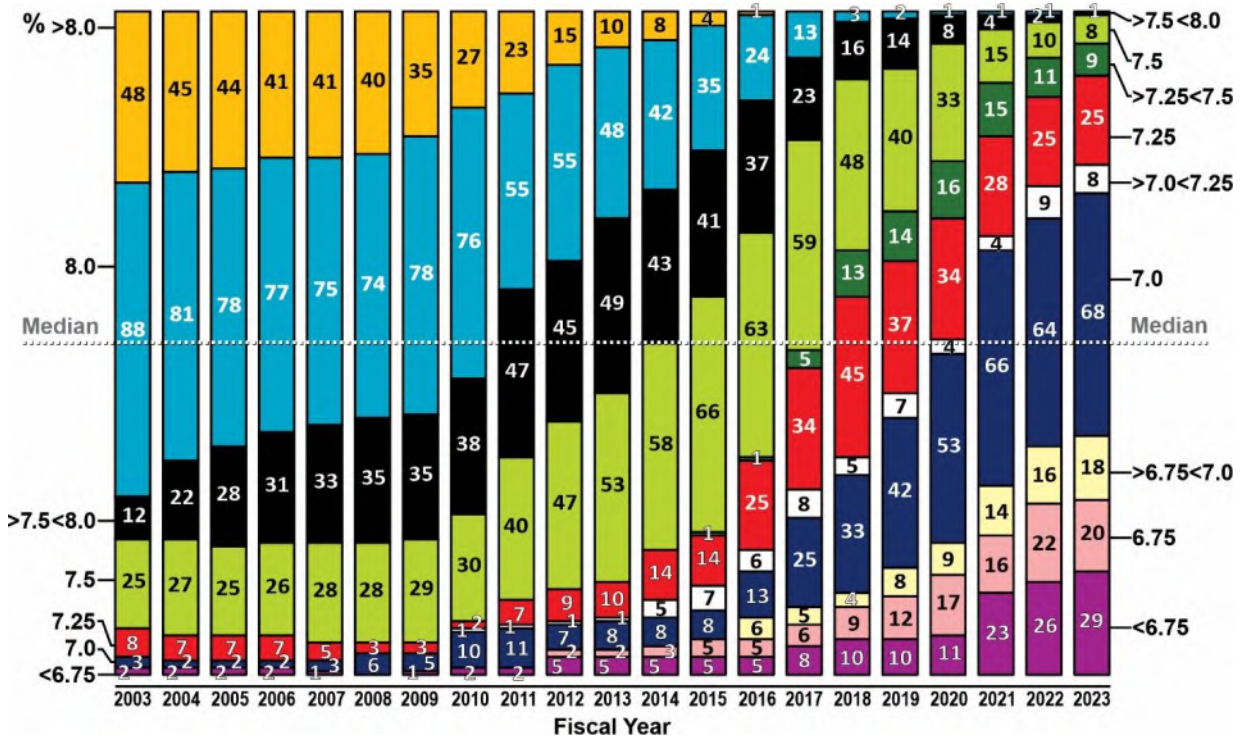
Cheiron concluded that the interest rate assumptions for all of the systems were reasonable. As it did in last year’s report, Cheiron again recommended that the Boards annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work and adjust assumptions accordingly. All of the systems complied with this recommendation prior to conducting the 2024 actuarial valuations.

Cheiron noted that, over the last two decades, declining interest rates have forced pension plans to either reduce their discount rates, increase their exposure to investment risk, or some combination of the two. For example, in June 2006, the yield on 10-year Treasury bonds (a proxy for a risk free investment) reached a high of 5.1%. To achieve an assumed return of 8.0%, a system’s investments had to outperform the yield on the 10-year Treasury by 2.9%. In June 2020, the yield on the 10-year Treasury had dropped to 0.7%, and to achieve an assumed return of 6.50%, a system’s investments need to exceed the 10-year Treasury yield by 5.8%. Even though, in this example, a system reduced its assumption by 150 basis points, it still had to take more investment risk in 2020 to meet its assumption than it did in 2006. Since 2020, yields on 10-year Treasury bonds have increased, reducing the expected risk premium needed to achieve the System’s assumed return. Yields on 10-year Treasury bonds have been approximately 4% during 2024; therefore, the System’s investments currently only need to exceed the 10-year Treasury yield by about 2.5% to achieve the 6.50% assumed return, which is the lowest expected risk premium over the last 20 years. If these higher Treasury bond yields persist, plans may be able to achieve the expected return with less exposure to investment risk. However, if these

higher Treasury bond yields prove temporary, plans could quickly find the pressure returning to further reduce discount rates or increase their exposure to investment risk.

Cheiron discussed the nationwide movement among pension plans to lower the interest rate assumption. The Public Plans Database is maintained by a partnership between the Center for State and Local Government Excellence and the Center for Retirement Research at Boston College with support from the National Association of State Retirement Administrators. This database contains historical information on large public pension plans, including key assumptions used in their actuarial valuations. Digest Exhibit 3 shows the change in the interest rate assumptions for 186 public pension plans from 2003 through 2023 as of June 6, 2024.

Digest Exhibit 3
CHANGE IN INTEREST RATE ASSUMPTIONS SINCE 2003
 186 Pension Plans in the Nation’s Largest Public Retirement Systems



Source: Public Pension Database as of June 6, 2024.

The exhibit shows the shift to lower interest rate assumptions. In 2003, 136 of the 186 plans (73.1%) used an interest rate assumption of 8.0% or higher. The data as of June 6, 2024, shows that this number has dropped to zero. The median assumption has fallen to 7.00%. Since 2019, 128 of the 186 plans have reduced the interest rate assumption with an average reduction of 0.39%. In addition, as of 2023, 135 plans have adopted a rate of 7.0% or lower.

Inflation Assumption

Four of six retirement systems use an inflation assumption of 2.25% (see Digest Exhibit 4). SURS increased its inflation assumption from 2.25% to 2.40% for its 2024 valuation. TRS uses an inflation assumption of 2.50% which was increased for its 2022 valuation.

Digest Exhibit 4
INFLATION ASSUMPTIONS
 June 30, 2024 Valuation

System	Inflation Rate	Notes
Teachers’ Retirement System	2.50%	Increased from 2.25% for the June 30, 2022 actuarial valuation
State Universities Retirement System	2.40%	Increased from 2.25% for the June 30, 2024 actuarial valuation
State Employees’ Retirement System	2.25%	Lowered from 2.50% for the June 30, 2019 actuarial valuation
Judges’ Retirement System	2.25%	Lowered from 2.50% for the June 30, 2019 actuarial valuation
General Assembly Retirement System	2.25%	Lowered from 2.50% for the June 30, 2019 actuarial valuation
Chicago Teachers’ Pension Fund	2.25%	Lowered from 2.50% for the June 30, 2020 actuarial valuation

Source: Retirement system actuarial reports.

Cheiron concluded that the inflation assumptions used by the six retirement systems were reasonable. Cheiron’s rationale for concurring with the inflation assumptions includes the following:

- The May 2024 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years), inflation will average between 1.8% and 3.0%. Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.4%.
- Cheiron presented three inflation comparisons: 1) the distribution of inflation expectations for the Third Quarter 2024 survey of professional economic forecasters published by the Philadelphia Federal Reserve; 2) the 2024 Horizon survey of investment consultant capital market assumptions (20-year); and 3) the 2023 inflation assumptions used by plans in the Public Plans Database. The 2.50% rate used by TRS is near the middle of the range used by other public pension plans, and is at the 75th percentile of the ranges projected by investment consultants in the Horizon survey and by professional economic forecasters. The 2.25% rate used by four retirement systems is in the second quartile of the range projected by professional economic forecasters and the lower quartile for investment consultants and other public pension plans.

The inflation assumption primarily impacts the salary increase assumption. The salary increase assumption is generally comprised of the inflation assumption and

a productivity, or real wage growth assumption.

Demographic Assumptions

The retirement systems utilize a number of demographic assumptions such as mortality rates, disability rates, and termination rates. Cheiron reviewed the demographic assumptions and concluded that they were reasonable. Cheiron included additional analysis in its reports on each of the systems. Cheiron collected data from past valuation reports and presented a historical review of past demographic and salary increase experience gains and losses. Results were presented in a chart which showed the pattern of annual gains and losses attributable to different sources. These charts can be found in chapters one through six. Different measures were used for each system depending on the information available but sources used included:

- Active and retiree mortality;
- Disability;
- New entrants;
- Benefit recipients;
- Salary increases;
- Retirement; and
- Terminations.

An examination of these trends can be used to determine if adjustments need to be made to assumptions or if additional disclosures need to be made in the actuarial valuation reports. Additional details on the demographic assumptions examined can be found in the chapters for each of the six retirement systems.

Proposed Certification of Required State Contribution

Each of the six retirement systems submitted to the State Actuary a proposed certification of the amount of the required State contribution for that system. **Cheiron verified the arithmetic calculations made by the systems’ actuaries to develop the required State contribution and reviewed the assumptions on which it was based.** Digest Exhibit 5 shows the amounts of proposed State contributions submitted by the systems for Fiscal Year 2026 and compares it to the previous year’s contribution. Overall, the required State contribution increased from \$11.75 billion to \$11.94 billion, an increase of \$0.19 billion.

Digest Exhibit 5 AMOUNTS OF STATUTORILY REQUIRED STATE CONTRIBUTIONS		
System	State Contribution (for Fiscal Year 2025)	State Contribution (for Fiscal Year 2026)
Teachers’ Retirement System	\$6,203,922,413	\$6,495,717,664
State Universities Retirement System	\$2,216,284,000	\$2,322,832,000
State Employees’ Retirement System	\$2,813,519,000	\$2,597,558,000
Judges’ Retirement System	\$148,889,000	\$151,882,000
General Assembly Retirement System	\$26,210,000	\$26,501,000
Chicago Teachers’ Pension Fund ¹	\$338,683,000	\$346,838,000
Total	\$11,747,507,413	\$11,941,328,664

¹The State contribution for CTPF is limited to the employer normal cost for that fiscal year.
Source: 2024 Retirement system actuarial valuation reports.

Actuarial Funding Methods

Actuarial funding methods consist of three components: (1) the actuarial cost method, which is the attribution of total costs to past, current, and future years; (2) the asset valuation method (i.e., asset smoothing); and (3) the amortization method.

Actuarial Cost Method

All of the retirement systems use the Projected Unit Credit cost method to assign costs to years of service. This method is required under the Illinois Pension Code. Cheiron had no objection to using the Projected Unit Credit cost method as it is an acceptable method that is used by other public sector pension funds. However, Cheiron would prefer the Entry Age Normal funding method as it is more consistent with the Pension Code’s requirement for level percentage of pay funding.

Under the Projected Unit Credit method, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the

valuation date but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the actuarial liability for a given active participant. Under the Projected Unit Credit cost method, the value of an active participant’s benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. While the Projected Unit Credit method is not an unreasonable method, as a result of this pattern of benefit values increasing, more plans use the Entry Age Normal cost method to mitigate this effect. It should also be noted that the Entry Age Normal cost method is the required method to calculate liability for the Governmental Accounting Standards Board Statements 67 and 68.

Asset Valuation Method

The actuarial value of assets for the systems is a smoothed market value. Unanticipated changes in market value are recognized over five years for all of the systems except CTPF, which smooths over four years. The primary purpose for smoothing out gains and losses over multiple years is so fluctuations in the contributions will be less volatile over time than if based on the market value of assets. Cheiron concurred with the use of the asset smoothing method noting that smoothing the market gains and losses over a period of years to determine the actuarial value of assets is a generally accepted approach in determining actuarial cost.

Amortization Method

The mandated State contribution is based on a determination of the level percentage of payroll that is expected to achieve a 90% funded ratio in 2045 (2059 for CTPF). While not a traditional amortization method, this methodology effectively amortizes a portion of the unfunded actuarial liability over the remaining period until 2045, which is currently 21 years.

One of the principles of funding public plans identified by the American Academy of Actuaries is that there should be “a plan to make up for any variations in actual assets from the funding target within a defined and reasonable time period.” Because it only targets 90%, the State method does not include a plan to achieve the funding target over any period of time.

Typical public plan amortization methods are designed to increase each year by expected payroll growth. Under the State mandated method, however, the effective amortization payment increases each year by more than the expected growth in payroll. As a result, the State mandated method defers payments on the unfunded actuarial liability further into the future than under typical public plan amortization methods.

Finally, as the remaining period to achieve 90% funding shortens, the State mandated method will also produce more volatile contributions. Instead of a single fixed period, typical public plan amortization methods use layered amortization bases such that new assumption changes and experience gains and losses are amortized over a new period (e.g., 20 years) while the remaining period for the prior amortization layers becomes one year shorter.

State Mandated Funding Method

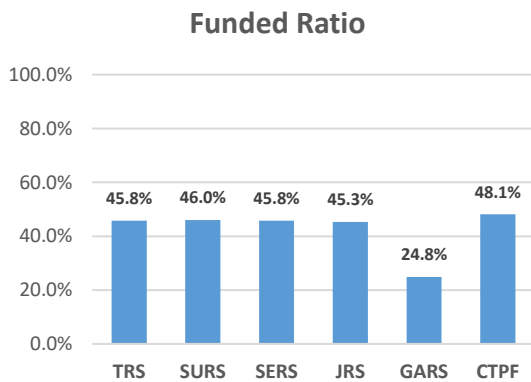
The Illinois Pension Code (for TRS, SURS, SERS, JRS, and GARS) establishes a method that does not adequately fund the systems. It requires the actuary to calculate the employer contribution as the level percentage of projected payroll that would accumulate assets equal to 90% of the actuarial accrued liability in the year 2045 if all assumptions are met. This contribution methodology does not conform to generally accepted actuarial principles and practices. Generally accepted actuarial funding methods target the accumulation of assets equal to 100% of the actuarial accrued liability, not 90%.

Cheiron recommended that the funding method be changed to employ a methodology that produces a reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period. The State Mandated Method will soon enter a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a reasonable Actuarially Determined Contribution without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the unfunded actuarial liability from growing and remain high enough to reduce the unfunded actuarial liability each year until the plan is ultimately 100% funded within a reasonable period. The State Mandated Method will produce increasingly volatile contribution levels as the remaining period to achieve 90% funding shortens. Consequently, when changing to a reasonable Actuarially Determined Contribution, consideration should be given to a method, such as layered amortization, that produces more stable contribution requirements.

In the actuarial valuation reports, the systems’ actuaries discuss their concerns with the State mandated funding method. The actuarial valuation reports include recommended funding policies that conform to a goal of full funding within a reasonable time period and conform with generally accepted actuarial principles and practices.

Based on the systems’ 2024 actuarial valuation reports, the funded ratio of the systems ranged from 48.1% (CTPF) to 24.8% (GARS) based on the actuarial value of assets as a ratio to the actuarial liability (see Digest Exhibit 6). If there is a significant market downturn, the unfunded actuarial liability and the required State contribution rate could both increase significantly, putting the sustainability of the systems further into question.

Digest Exhibit 6
**SYSTEM FUNDED RATIO
 (ACTUARIAL VALUE OF ASSETS)**



Source: 2024 actuarial valuation reports.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023, effective July 6, 2017, modified the State’s funding policy to require that the contribution impact of all assumption changes be phased-in over a five-year period. As such, the Act delays the recognition of the impact of assumption changes when calculating the contribution requirement of the System. Assumption changes are intended to more accurately anticipate the obligations for funding based on the most recent experience analysis and forward-looking changes to future investment returns. However, only one-fifth of the impact of these changes are now recognized from the date of adoption. The remainder of the impact is recognized over four additional years such that the full impact is only recognized at the end of a five-year period beginning at the date of adoption. This phase-in provides time to adjust to a higher level of contributions.

However, the Conference of Consulting Actuaries White Paper on Actuarial Funding Policies and Practices for Public Pension Plans recommends that the “phase-in period should be no longer than the time period until the next review of assumptions.” Because experience studies are performed every three years, Cheiron recommended that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, changing the phase-in period is under the jurisdiction of State law and not the Retirement Systems.

Assessment and Disclosure of Risk

Actuarial Standard of Practice (ASOP) 51 provides guidance to actuaries on the assessment and disclosure of risks to help readers of the actuarial valuation report “*understand the effects of future experience differing from the assumptions used*” and “*the potential volatility of future measurements resulting from such differences.*”

Cheiron assessed compliance with ASOP 51 for five of the systems (TRS, SURS, SERS, JRS, and GARS). Several recommendations in this area were implemented by the systems and not repeated in this year’s report. However, there was one recommendations directed to TRS. Cheiron recommended the actuary provide an assessment for each of the key risks identified.

Implications of the Funding Policy

Cheiron also assessed compliance with Actuarial Standard of Practice 4 (measuring pension obligations and determining costs). The actuarial valuation report for TRS includes disclosures of the implications of the State Mandated Funding Policy. However it should also include an estimate of how long until contributions under the funding policy will exceed normal cost plus interest on the unfunded actuarial liability. Therefore, Cheiron recommended the TRS actuary disclose how long before the State Mandated Contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability.

Analysis Of Funding Adequacy

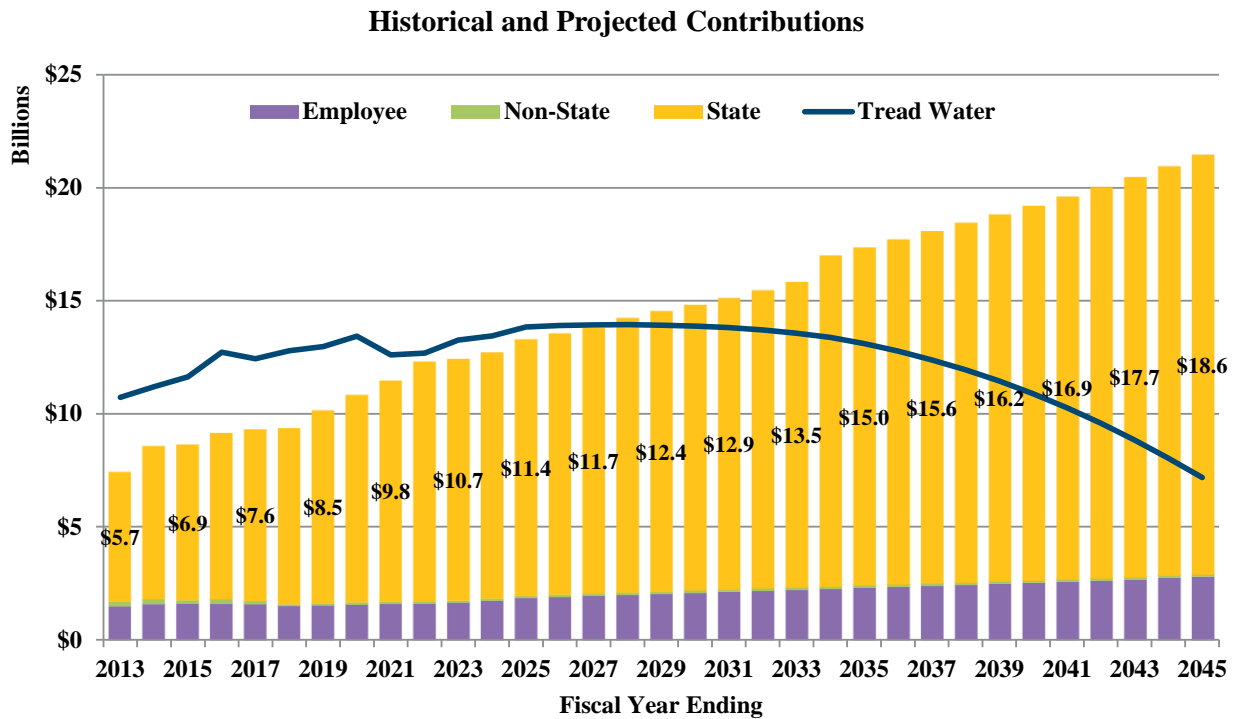
Cheiron examined the adequacy of the funding for the systems, including funded ratio, the sources of changes in the unfunded actuarial liability, and projections of the unfunded actuarial liability. This analysis is contained in the State Actuary’s preliminary reports for each of the retirement systems, found in chapters one through six of this report.

One of the historical sources of the increase in unfunded actuarial liability is due to actual contributions to the System being less than the tread water contribution (the amount needed to prevent the unfunded actuarial liability from increasing if all assumptions are met).

Digest Exhibit 7 shows the combined historical and projected contributions for five of the systems (TRS, SURS, SERS, JRS, and GARS). As the chart below shows, actual contributions have been significantly less than the tread water cost. Each year that total contributions remain below the tread water cost (blue line), the unfunded actuarial liability is expected to grow. As shown in the graph below, the contributions from the State will need to increase before the total contribution reaches the tread water contribution and begins to pay down the unfunded actuarial liability.

Digest Exhibit 7

HISTORICAL AND PROJECTED CONTRIBUTIONS COMPARED TO TREAD WATER COST



Source: Cheiron analysis of system funding adequacy.

Responses to the Recommendations

Each of the six retirement systems provided responses to Cheiron’s recommendations contained in the preliminary reports. The systems generally agreed with Cheiron’s recommendations. The complete responses are in Appendix D.

This annual review was conducted by Cheiron, the State Actuary, with the assistance of the staff of the Office of the Auditor General.

SIGNED ORIGINAL ON FILE _____

JOE BUTCHER
Division Director

This report is transmitted in accordance with Section 5/2-8.1(c) of the Illinois State Auditing Act.

SIGNED ORIGINAL ON FILE _____

FRANK J. MAUTINO
Auditor General

FJM:DJB

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Glossary

Actuarial Assumptions	Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, investment income, and salary increases. Demographic assumptions (rates of mortality, disability, turnover, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the Present Value of Future Benefits between the Present Value of Future Normal Cost and the Actuarial Liability. This is sometimes referred to as the “actuarial funding method.”
Actuarial Gain (Loss)	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two actuarial valuation dates, as determined in accordance with a particular Actuarial Cost Method.
Actuarial Liability	The Actuarial Liability is the Actuarial Present Value of all benefits accrued as of the valuation date using the methods and assumptions of the valuation. It is also referred to by some actuaries as the “accrued liability” or “actuarial accrued liability.”
Actuarial Present Value	The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment.
Actuarial Value of Assets (AVA)	The Actuarial Value of Assets equals the Market Value of Assets adjusted according to the smoothing method in accordance with Illinois Law. The smoothing method is intended to smooth out the short-term volatility of investment returns in order to stabilize contribution rates and the Funded Ratio.
Asset Smoothing Method	A method of asset valuation where the annual fluctuation in the Market Value of Assets is averaged over a period of years. See Actuarial Value of Assets above.
Entry Age Normal (EAN)	A method under which the Present Value of Future Benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this Present Value of Future Benefits

Glossary

allocated to a valuation year is called the Normal Cost. The portion of this Present Value of Future Benefits not provided for at a valuation date by the Present Value of Future Normal Costs is called the Actuarial Liability.

Funded Ratio	The Actuarial Value of Assets divided by the Actuarial Liability. The Funded Ratio represents the percentage of assets in the System compared to the budgeted amount under the Projected Unit Credit Actuarial Cost Method. The Funded Ratio can also be calculated using the Market Value of Assets.
Governmental Accounting Standards Board	The Governmental Accounting Standards Board (GASB) defines the accounting and financial reporting requirements for governmental entities. GASB Statement No. 67 defines the plan accounting and financial reporting for governmental pension plans, and GASB Statement No. 68 defines the employer accounting and financial reporting for participating in a governmental pension plan.
Market Value of Assets (MVA)	The fair value of the System's assets assuming that all holdings are liquidated on the measurement date.
Normal Cost	The annual cost assigned, under the Actuarial Cost Method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the Unfunded Actuarial Liability is not part of the Normal Cost.
Present Value of Future Benefits	The estimated amount of assets needed today to pay for all benefits promised in the future to current members of the System assuming all Actuarial Assumptions are met.
Present Value of Future Normal Costs	The Actuarial Present Value of retirement system benefits allocated to future years of service.
Projected Unit Credit (PUC)	A method under which the benefits of each individual included in an actuarial valuation are allocated by a consistent formula to the years in which they are earned. The Actuarial Present Value of benefits allocated to a valuation year is called the Normal Cost. The Actuarial Present Value of benefits allocated to all periods prior to a valuation year is called the Actuarial Liability.
Unfunded Actuarial Liability (UAL)	The Unfunded Actuarial Liability represents the difference between the Actuarial Liability and Actuarial Value of Assets. This is sometimes referred to as "unfunded accrued liability."

Chapter One

Preliminary Report on the Teachers' Retirement System

In accordance with 30 ILCS 5/2-8.1, Cheiron, the State Actuary, submitted a preliminary report to the Board of Trustees of the Teachers' Retirement System

(TRS) concerning proposed certifications of required State contributions submitted to Cheiron by the Board. The preliminary report was submitted to TRS on November 26, 2024. The preliminary report was based on Cheiron's review of actuarial assumptions included in TRS' 2024 Actuarial Valuation Report.

Following is Cheiron's final preliminary report on the Teachers' Retirement System. TRS' written response, provided on December 13, 2024, can be found in Appendix D.

OVERVIEW**TEACHERS' RETIREMENT SYSTEM**

as of June 30, 2024

Actuarial accrued liability	\$154,325,159,164
Actuarial value of assets	\$70,687,607,498
Unfunded liability	\$83,637,551,666
Funded ratio	45.8%

Employer normal cost	\$1,369,286,078
State contribution (FY26)	\$6,495,717,664

Active members	169,752
Inactive members	153,196
Current benefit recipients	<u>131,568</u>
Total membership	454,516

Interest rate assumption	7.00%
Inflation assumption	2.50%
Actuarial cost method	Projected Unit Credit
Asset valuation method	5-year Smoothing

Executive Director	Stan Rupnik
Actuarial Firm	Segal Consulting

Source: June 30, 2024 TRS actuarial valuation report.

December 13, 2024

Mr. Frank Mautino
Auditor General
400 W. Monroe Street
Springfield, Illinois 62704

Board of Trustees
Teachers' Retirement System of the State of Illinois
2815 West Washington Street
Springfield, Illinois 62702

Dear Trustees and Auditor General:

In accordance with the Illinois State Auditing Act (30 ILCS 5/2-8.1), Cheiron is submitting this preliminary report concerning the proposed certification prepared by Segal Consulting (Segal) of the required State contribution to the Teachers' Retirement System of the State of Illinois (TRS or System) for Fiscal Year 2026.

In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law. We agree with Segal's opinion that the statutory mandated minimum funding requirements have produced inadequate funding of the Plan resulting in TRS being among the worst funded retirement systems in the country. In addition, the history of inadequate funding has resulted in current and future contribution levels, measured as a percentage of payroll, to be amongst the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings and recommendations. Section III provides the supporting analysis for those findings and presents more details on our assessment of the actuarial assumptions and methods employed in Segal's Actuarial Certification, as well as our assessment of Segal's determination of the required State contribution for Fiscal Year 2026. Section III also includes comments on other issues impacting the funding of TRS, including the implications of Article 16 of the Illinois Pension Code, which establishes the statutory minimum funding requirements for the System. Section IV reviews the projections contained in the draft June 30, 2024 Actuarial Valuation. Finally, Section V provides an analysis of funding adequacy.

In preparing this report, we relied on information (some oral and some written) supplied by TRS and Segal. This information includes actuarial assumptions and methods adopted by the TRS Board, plan provisions, the draft June 30, 2024 Actuarial Valuation, minutes of the 2024 plan year

TRS Board of Trustee meetings, Segal’s investment assumption presentation from June 2024 and Segal’s experience study presentation from August 2024, and various studies and memos prepared by the System’s advisors, staff, and Executive Director. A detailed description of all information provided for this review is in Appendix B.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Office of the Auditor General and the Teachers’ Retirement System of the State of Illinois for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron

SIGNED ORIGINAL ON FILE

Jake Libauskas, FSA, EA, MAAA
Consulting Actuary

SIGNED ORIGINAL ON FILE

Christian Benjaminson, FSA, EA, MAAA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Matthew Wells, FSA, EA, MAAA
Associate Actuary

**THE STATE ACTUARY’S PRELIMINARY REPORT ON THE
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SECTION I – REPORT SCOPE

Illinois Public Act 097-0694 (the Act) amended the Illinois State Auditing Act (30 ILCS 5/2-8.1) and requires Cheiron, as the State Actuary, to review the actuarial assumptions and valuation of the Teachers’ Retirement System of the State of Illinois (TRS or System) and to issue to the TRS Board this preliminary report on the proposed certification prepared by Segal Consulting (Segal) of the required State contribution for Fiscal Year (FY) 2026. The purpose of this review is to identify any recommended changes to the actuarial assumptions and methods for the TRS Board to consider before finalizing its certification of the required State contribution for FY 2026.

While the Act states that just the actuarial assumptions and valuation are to be reviewed, we have also reviewed the actuarial methodologies (funding and asset smoothing methods) employed in preparing the Actuarial Certification, as these methods can have a material effect on the amount of the State contribution being certified. Finally, we have offered our opinion on the implications of Article 16-158 of the Illinois Pension Code, which impacts the contribution amount certified by Segal.

In conducting this review, Cheiron reviewed the draft June 30, 2024 Actuarial Valuation prepared by Segal, minutes of the 2024 Board of Trustees meetings, Segal’s investment assumption presentation from June 2024 and Segal’s experience study presentation from August 2024, and various studies and memos prepared by the System’s advisors, staff, and Executive Director. A detailed description of all information reviewed is contained in Appendix B.

In addition to reviewing the Actuarial Certification of the required State contribution to TRS, the Act requires the State Actuary to conduct a review of the “actuarial practices” of the Board. While the term “actuarial practices” was not defined in the Act, we continue to interpret this language to mean that we reviewed: (1) the use of a qualified actuary (as defined in the Qualification Standards of the American Academy of Actuaries) to prepare the annual actuarial valuation for determining the required State contribution; and (2) the conduct of periodic formal experience studies to justify the assumptions used in the actuarial valuation. In addition, we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2024 Actuarial Valuation.

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SECTION II – SUMMARY OF RECOMMENDATIONS

This section summarizes recommendations from our review of the actuarial assumptions and methods employed in the draft June 30, 2024 Actuarial Valuation of TRS as well as the “actuarial practices” of the TRS Board. Section III of this report provides detailed analysis and rationale for these recommendations.

Proposed Certification of the Required State Contribution

Segal has determined that the FY 2026 required State contribution calculated under the current statutory funding requirements is \$6,495,717,664. We have verified the arithmetic calculations made by Segal to develop this required State contribution and have reviewed the assumptions on which it was based. We have accepted Segal’s 2024 actuarial liability as well as the annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions.

State Mandated Funding Method

1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State’s funding policy to require that the contribution impact of all assumption changes be phased-in over a five-year period.

2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing this phase-in period is under the jurisdiction of State law and not the Retirement System.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

30 ILCS 5/2-8.1 requires the State actuary to identify recommended changes in actuarial assumptions that the TRS Board must consider before finalizing its certification of the required State contribution. We have reviewed all the actuarial assumptions used in the draft June 30, 2024 Actuarial Valuation and conclude that the assumptions are reasonable in general, based on the evidence provided to us.

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SECTION II – SUMMARY OF RECOMMENDATIONS

Recommended Changes for the 2024 Valuation

3. As required by section 3.3 of ASOP 51, we recommend that Segal provide an assessment for each of the key risks they have identified. In particular, Segal identified “Economic and Other Related Risks” as a key risk, but they did not provide an assessment of “Economic and Other Related Risks” except for pointing to their assessments of Investment Risk and Demographic Risk. Since Segal separately identified “Economic and Other Related Risks”, they should provide a separate assessment of this risk. In addition, Segal identified Longevity Risk as a key risk and should provide an assessment of this risk, as they had done in prior years.
4. As required by section 3.19 of ASOP 4, we recommend that Segal disclose how long before the State Mandated Contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability and disclose whether the funding policy is significantly inconsistent with accumulating assets adequate to make benefit payments.

Recommended Changes for Future Valuations

5. We continue to recommend that Segal provide additional information in the valuation report about the projected demographics of the active population used in its projection such as the average age and service of the active population in each year of the projection.
6. We recommend the TRS Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.
7. We recommend that Segal include additional detail (e.g., exposures, actual experience, and expected experience) by the relevant age and/or service buckets throughout their experience study, similar to what was shown in the 2021 experience study report.
8. While it is a small component of the overall cost, we recommend that Segal provide a rationale for the significant expected increase in administrative expenses compared to the most recent actual administrative expenses.

GASB 67 and 68

The 2024 TRS GASB Nos. 67 and 68 information was provided in the 2024 Valuation. We find that the assumptions and methods used to prepare the 2024 TRS GASB Nos. 67 and 68 schedules are reasonable based on the materials provided to us.

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SECTION III – SUPPORTING ANALYSIS

In this section, we provide detailed analysis and supporting rationale for the recommendations that were presented in Section II of this report.

Proposed Certification of the Required State Contribution

As stated in our summary of recommendations in Section II, we have verified the arithmetic calculations made by Segal to develop the required State contribution, reviewed the assumptions on which it is based, and accepted Segal's 2024 actuarial liability as well as annual projections of future payroll, total normal costs, benefits, expenses, and total contributions. However, in accordance with 30 ILCS 5/2-8.1, our review does not include a replication of the actuarial valuation results.

State Mandated Methods

The Illinois Pension Code (40 ILCS 5/14-131) establishes a method that does not adequately fund the System. This law requires the actuary to calculate the employer contribution as the level percentage of projected payroll that would accumulate assets equal to 90% of the Actuarial Accrued Liability in the year 2045 if all assumptions are met. This contribution methodology does not conform to generally accepted actuarial principles and practices. Generally accepted actuarial funding methods target the accumulation of assets equal to 100% of the Actuarial Accrued Liability, not 90%.

We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period (Recommendation #1).

The State Mandated Method will soon enter a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the plan is ultimately 100% funded within a reasonable period.

The State Mandated Contribution for FY 2026 is sufficient to pay the employer normal cost, administrative expenses, and an amortization payment on the UAL that, if continued at the same percentage of payroll, would be expected to pay off the UAL in 28.8 years. According to "Actuarial Funding Policies and Practices for Public Plans" published by the Conference of Consulting Actuaries an amortization period greater than 25 years but not greater than 30 years is considered a reasonable transition policy but is a "Non-Recommended Practice" on an ongoing basis. While the current contribution amount is not considered reasonable, the declining normal cost combined with the State Mandated Method will produce shorter amortization funding periods in the future.

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SECTION III – SUPPORTING ANALYSIS

The State Mandated Method will produce increasingly volatile contribution levels as the remaining period to achieve 90% funding shortens. Consequently, when changing to a reasonable ADC as described above, consideration should be given to a method, such as layered amortization, that produces more stable contribution requirements.

In its draft June 30, 2024 Actuarial Valuation on pages 16 through 18, Segal demonstrates the implications of the statutory funding amounts on the growth of the unfunded actuarial liability. With support of the TRS Board, Segal reports on an alternative funding policy that they consider adequate and refers to this method as the *Board-Adopted Actuarial Funding Policy*. We note that this policy meets the requirements of a Reasonable Actuarially Determined Contribution and satisfies the requirement first effective in 2023 to calculate and disclose a Reasonable Actuarially Determined Contribution (ADC). Using this methodology, the State's contribution amount would be \$10,734,362,004 for FY 2026. While we concur with Segal's recommendations and demonstration of a Reasonable ADC, we do not believe that requesting the over \$10 billion in State contributions for FY 2026 is plausible. There are other funding policies that would also meet the requirements of a Reasonable ADC, and we suggest modifying this methodology to one that starts with a contribution that is plausible and targets 100% funding within a reasonable period.

The method Segal calls the *Board-Adopted Actuarial Funding Policy* is described in Section 2 beginning on page 44 of their Actuarial Valuation Report with the cost developed on pages 45 and 70. The method includes the following provisions:

- The use of the Entry Age Normal Method (EAN) instead of the Projected Unit Credit (PUC) method. Actuarial methods differ in how they allocate the cost of benefits over a participant's lifetime. PUC, which is called for in the statutory contribution determination, determines the cost of benefits at the participant's attained age. Therefore, as a participant gets older and the anticipated benefits are discounted over a decreasing period from expected retirement to attained age, their cost—the normal cost—will increase. With a large group and stable population, the actual normal costs don't necessarily increase because the average age of the population remains constant. Under EAN, the normal cost is determined as a level percent of pay from age at entry into the system to normal retirement. This method typically provides a more stable cost as a percent of pay and is the same method required by GASB for Statement 67 and 68 disclosures.
- The unfunded liability under the *Board-Adopted Actuarial Funding Policy* is amortized over 20 years with the annual payments scheduled to increase by 2.0%. The rate of 2.0% is to reflect, according to Segal, the expected State revenue growth rate. This assumption should be documented, and a reference cited for the source in the valuation report, as well as an explanation of why revenue growth is expected to be lower than inflation. Amortizing the unfunded liability on an increasing basis can be an issue because it can result in the initial payments not being sufficient to cover the interest cost. However, selection of the 20 years and use of 2.0% for the annual increase rate results in the first and all future payments of each amortization base covering the interest cost on the unfunded liability as well as a portion of

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SECTION III – SUPPORTING ANALYSIS

the principal. We have confirmed TRS’ statement that, based on this method of amortization, the principal on the unfunded liability would begin to be paid down in the first year.

- All future changes to the unfunded liability not attributable to the current amortization amounts such as experience, benefit changes, and changes in assumptions are to be amortized using the same 20-year amortization methodology.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State’s funding policy to require that the contribution impact of all assumption changes, including changes prior to P.A. 100-0023, be phased-in over a five-year period. As such, the Act delays the recognition of the current cost of funding the System. Assumption changes are intended to more accurately anticipate the obligations for funding based on the most recent experience analysis and forward-looking changes to future investment returns. However, only one-fifth of the impact of these changes are now recognized from the date of adoption. The remainder of the impact is recognized over four additional years such that the full impact is only recognized at the end of a five-year period beginning at the date of adoption. This phase-in provides time to adjust to a higher level of contributions. However, the Conference of Consulting Actuaries White Paper on Actuarial Funding Policies and Practices for Public Pension Plans recommends that the “phase-in period should be no longer than the time period until the next review of assumptions.” **Because experience studies are performed every three years, we recommend the phase-in period for the impact of assumption changes be reduced to no longer than three years** (Recommendation #2).

Optional Hybrid Plan

P.A. 100-0023 created an Optional Hybrid Plan (Tier 3) for current Tier 2 members and future new hires. The Optional Hybrid Plan consists of a reduced defined benefit plan and a defined contribution plan. In general, the defined benefit component is based on a ten-year final average pay (compared to an eight-year final average pay for Tier 2), a 1.25% multiplier compared to 2.2% for Tier 2.

Segal has not reflected the Tier 3 Optional Hybrid Plan in the draft June 30, 2024 Actuarial Valuation. We understand that TRS will not implement the Optional Hybrid Plan until clarifying legislation is passed. Given the need for additional legislation, we believe it is reasonable not to reflect the Optional Hybrid Plan in the current valuation.

Stress Testing

Segal includes stress testing projections of the impact of varying investment return assumptions, varying actual investment return for the upcoming year, annual salary increases that are 100 basis points above and below the current assumption, and a 1% increase and decrease in the projected active population.

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SECTION III – SUPPORTING ANALYSIS

Based on the draft June 30, 2024 Actuarial Valuation, the funded ratio, measured as the ratio of the Actuarial Value of Assets to the actuarial liability, is currently at 45.8%. The unfunded actuarial liability is currently about \$83.6 billion and is not expected to be below that level until 2030. The required State contribution rate is projected to be about 49.0% of payroll for FY 2026 and is expected to increase to about 52.8% of payroll for FY 2034 when the pension obligation bonds have been paid off. If there is a significant market downturn, the unfunded actuarial liability and the required State contribution rate could both increase significantly, putting the sustainability of the system further into question. Therefore, stress testing should continue to be performed to better understand these risks and the potential advantages of additional contributions in the near term to maintain the sustainability of the system.

Actuarial Standard of Practice 51

Actuarial Standard of Practice (ASOP) 51 provides guidance to actuaries on the assessment and disclosure of risks to help readers of the actuarial valuation report “*understand the effects of future experience differing from the assumptions used*” and “*the potential volatility of future measurements resulting from such differences.*”

ASOP 51’s first requirement is to “*identify risks that, in the actuary’s professional judgment, may reasonably be anticipated to significantly affect the plan’s future financial condition.*” Segal identified five sources of risk to TRS: economic and other related risks, investment risk, longevity risk, contribution risk, and demographic risk. With the exception of the contribution risk due to the statutorily required amount of contributions, the risks Segal identified are relatively generic and would apply to most pension plans. There are other risks specific to TRS that we believe Segal should also address. For example, the current projected growth rate for contributions under the statutorily required method significantly exceeds the projected growth rate for State revenues under TRS’ assumptions, creating what appears to be a significant risk to future contributions.

ASOP 51 requires the actuary to assess each of the risks identified. While the assessment does not have to be quantitative, it does have to take into account the specifics of the individual plan. ASOP 51 also describes several quantitative methods that may be used to assess risk.

- Economic and Other Related Risks. Segal lists three potential implications for the Plan. That is, 1) volatile financial markets and investment returns lower than assumed, 2) high inflationary environment impacting salary increases and Tier 2 COLAs, and 3) lingering direct and indirect effects of the COVID-19 pandemic. However, Segal does not assess economic and other related risks beyond listing these potential implications and pointing to their assessments of Investment Risk (varying investment returns) and Demographic Risk (varying salary increases). Since Segal separately identified “Economic and Other Related Risks”, they should provide a separate assessment of this risk. **We recommend that Segal provide an assessment for each of the key risks they have identified** (Recommendation #3).
- Investment Risk. Segal describes the impact of a 1% variation in the investment return in the next year, quantifies the impact of a 10% investment gain or loss, and references the additional

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sensitivity projections in Section 1 of their report. These sensitivity projections provide an appropriate but limited assessment of investment risk.

- Longevity Risk. In prior years, Segal assessed this risk by applying a benchmark for a 10% reduction in mortality to TRS to provide an assessment of the impact on the unfunded actuarial liability. However, this assessment does not appear in the draft June 30, 2024 actuarial valuation. **We recommend that Segal provide an assessment for each of the key risks they have identified** (Recommendation #3).
- Contribution Risk. Segal discusses several issues with the statutorily required contribution amounts in the risk section as well as in other parts of the valuation report and quantifies the impact of the statutorily required contributions versus the board-adopted contribution policy.
- Demographic Risk. Segal provides an explanation of demographic risks, shows projections assuming higher and lower salary increases, shows projections if the projected active headcount differs by 1%, and uses the Plan's historical experience to provide an assessment of the risk.

ASOP 51 requires the actuary to recommend a more detailed assessment of risks if it “*would be significantly beneficial.*” While there is a fair amount of risk assessment included in the valuation report, Segal recommends an additional more detailed assessment.

ASOP 51 requires the actuary to “*calculate and disclose plan maturity measures that ... are significant to understanding the risks associated with the plan.*” Segal calculates the Full-Time actives to non-active ratio, the retired life liability as a percentage of total liability, and the current year's net cash flow. There is a brief explanation of how these measures indicate a greater reliance on investment returns and a higher volatility in contribution requirements. There are also other maturity measures, such as the assets to payroll ratio and the actuarial liability to payroll ratio that provide significant information about the potential effects of investment risk and demographic risk. Segal discusses the importance of monitoring the continued maturation of the plan but doesn't provide any projections of any of these maturity measures even though most are readily available given the projections required to determine the statutory contribution amounts.

ASOP 51 requires the actuary to “*identify and disclose relevant historical values of the plan's actuarial measurements that, in the actuary's professional judgment, are significant to understanding the risks identified....*” Segal uses some relevant historical information in the assessment of each risk except longevity. On page 27, Segal provides the active to non-active member ratio for the last 10 years, and on page 33, Segal provides a chart comparing contributions to benefit payments and expenses for the last 10 years. While it would also be useful to show the historical retired life liability as a percentage of total liability, we agree that these historical measures provide context to the current maturity measures.

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Actuarial Standard of Practice 4

Actuarial Standard of Practice No. 4 (ASOP 4) was amended and the changes are effective for TRS’ actuarial valuations starting June 30, 2023. The revised ASOP added three requirements for actuarial valuation reports.

Calculate and disclose a Reasonable Actuarially Determined Contribution

Segal calculates and discloses the funding policy contribution set forth by the Board, the *Board-Adopted Actuarial Funding Policy*, which meets the requirements of a Reasonable Actuarially Determined Contribution.

Implications of the Funding Policy

In the draft June 30, 2024 Actuarial Valuation Report, Segal includes disclosures of the implications of the State Mandated Funding Policy:

1. A qualitative assessment that future contributions are expected to be a level percentage of payroll and that the funded ratio will increase to 90 percent by 2045, and
2. A statement that the unfunded actuarial liability is never expected to be paid off

However, the draft June 30, 2024 Actuarial Valuation Report should also include:

3. An estimate of how long until contributions under the funding policy will exceed normal cost plus interest on the unfunded actuarial liability, and
4. An assessment of whether the funding policy is significantly inconsistent with accumulating assets adequate to make benefit payments, and, if applicable, an estimate of the approximate time until assets are depleted.

As required by section 3.19 of ASOP 4, we recommend that Segal disclose how long before the State Mandated Contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability and disclose whether the funding policy is significantly inconsistent with accumulating assets adequate to make benefit payments (Recommendation #4).

Calculation and Disclosure of Low Default Risk Obligation Measure (LDROM)

The draft June 30, 2024 Actuarial Valuation Report includes a description and calculation of LDROM. This includes an explanation of the discount rate, cost method, and assumptions used to calculate LDROM. Segal has also included a comparison of the LDROM to the Actuarial Accrued Liability and commentary explaining the significance of the LDROM as required by ASOP 4 “with respect to the funded status of the plan, plan contributions, and the security of participant benefits.”

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Assessment of Actuarial Assumptions Used in the 2024 Valuation

A. Economic Assumptions

The economic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Experience Review Report dated August 16, 2024, and the Investment Return Assumption Review dated June 18, 2024, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. Interest Rate

The interest rate assumption (also called the investment return or discount rate) is the most impactful assumption affecting the required State contribution amount. This assumption, which is used to value liabilities for funding purposes, was reduced to 7.00% for the June 30, 2016 Actuarial Valuation. This change was recommended by Segal and supported by their report and presentation to the Board in August of 2016.

This assumption has been reviewed annually, and most recently was reviewed in August 2024. Segal stated that the assumption can remain at 7.00% or be reduced for additional conservatism.

After reviewing all the materials (see Appendix B of the report) that were made available, Cheiron concludes that the interest rate of 7.00% for this valuation is reasonable.

We recommend the TRS Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly (Recommendation #6).

The items we considered and our rationale for this recommendation are as follows:

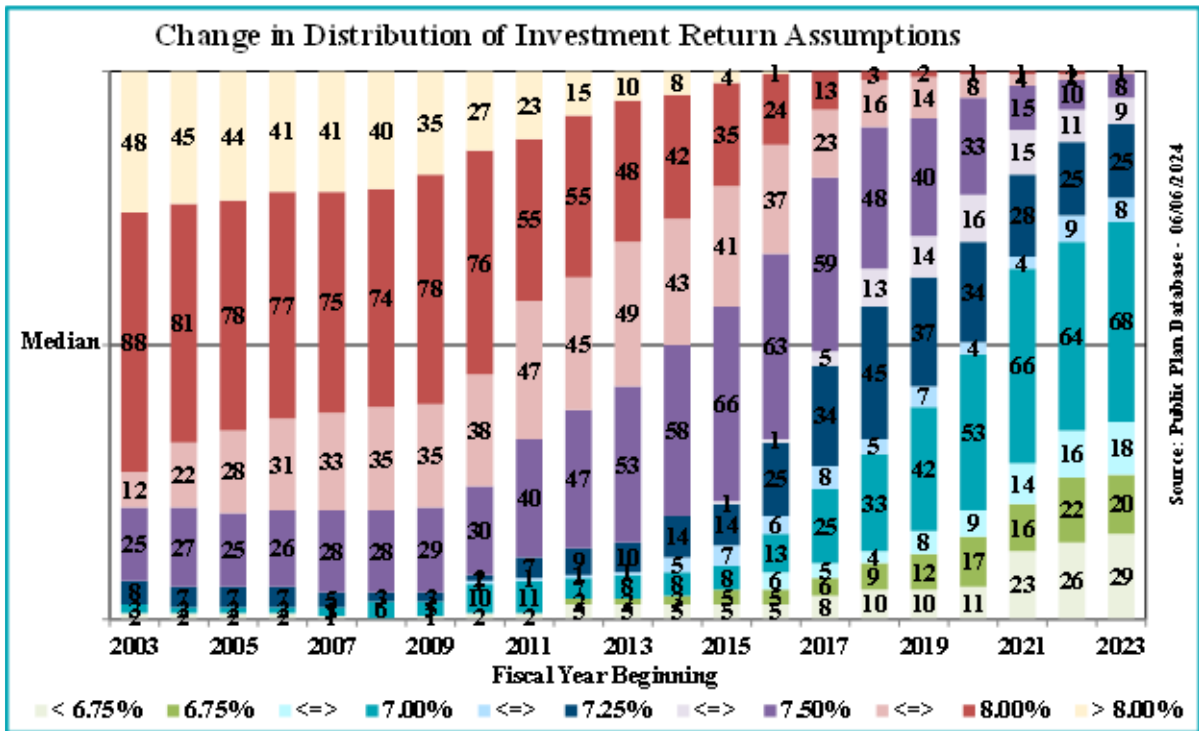
- A review of the interest and inflation rates does not involve the collection of significant data and can be updated annually. In addition, it keeps the Board focused more closely on these critical assumptions.
- In Segal's August 16, 2024 Experience Review of the investment return assumption, they presented the 10-year and 20-year expectations for the TRS portfolio based on the capital market assumptions from the 2023 Horizon Survey, adjusted for TRS' higher cost implementation style, and current target asset allocation provided by TRS staff. Segal calculated a weighted median real rate of return expectation of 4.96% by applying a 42% weight to the 10-year expectation and a 58% weight to the 20-year expectation and reducing the resulting expectation by 20 basis points to reflect changes in market outlook since early 2023 (i.e., the date of the 2023 Horizon Survey capital

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market assumptions.) Segal's total expected geometric return is 7.46% for the TRS portfolio.

- As is the case with most maturing pension plans, TRS is experiencing negative cash flows measured as contributions less benefits and expenses. TRS' negative cash flow is currently 1.2% and projected to average about 2.0% of assets. When short-term returns are expected to be lower than the long-term expectations, which is the case with TRS, a plan with negative cash flows will have actuarial returns (i.e., dollar weighted returns) that are less than their "time weighted" returns.
- While the discount rate assumption should be based on the future expected investment returns for the System's investment portfolio, survey information can provide an important context for evaluating the assumption. The Public Plans Database is maintained by a partnership between the Center for State and Local Government Excellence (SLGE) and the Center for Retirement Research at Boston College with support from the National Association of State Retirement Administrators (NASRA). This database contains historical information on large public pension plans, including key assumptions used in their actuarial valuations. The following chart shows the distribution of investment return assumptions for the 186 plans in the Public Plans Database with consistent information from 2003 through 2024 as of June 6, 2024.



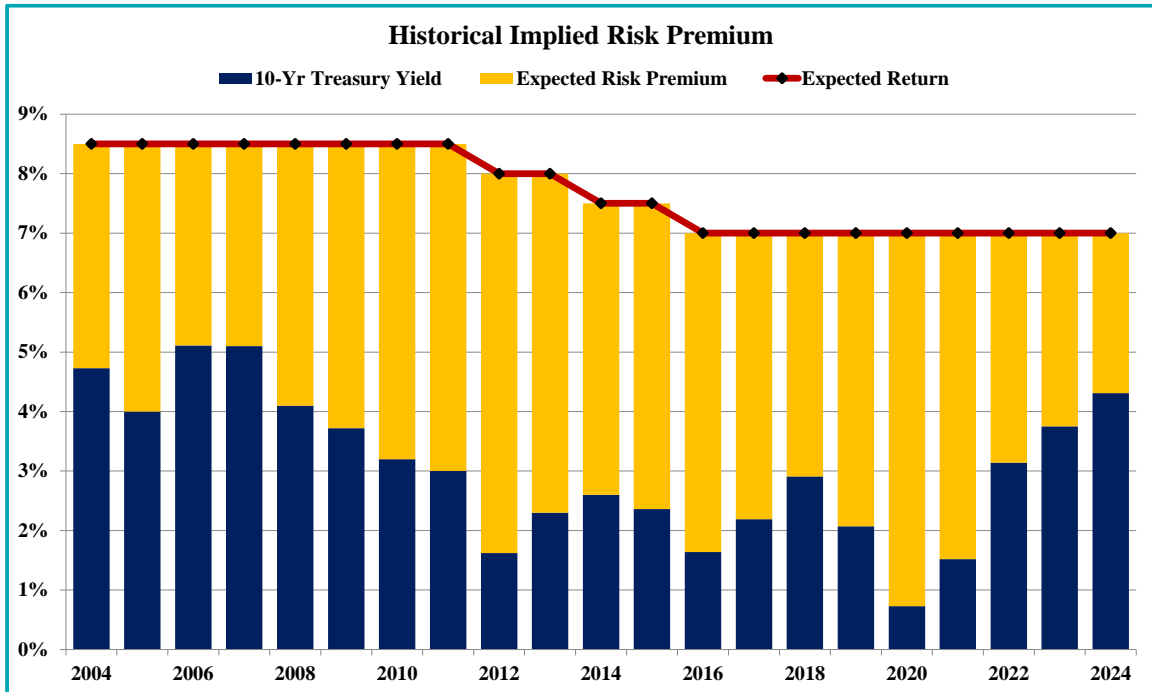
Over the period shown, there continues to be a pattern of reducing discount rates partially reflecting long-term changes in capital markets, interest rates and underlying

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inflation. Of the 186 plans shown, 128 have reduced their discount rate assumption since 2019. For these plans, the average reduction is 0.39%.

- Over the last two decades, declining interest rates forced pension plans to either reduce their discount rates, increase their exposure to investment risk, or some combination of the two. For example, as shown in the chart below, in June 2006, the yield on 10-year Treasury bonds (a proxy for a risk-free investments) reached a high in the 20-year period of 5.1%. To achieve TRS' then assumed return of 8.50%, the System's investments had to outperform the yield on the 10-year Treasury by 3.4%. In June 2020, the yield on the 10-year Treasury had dropped to 0.7%, and to achieve TRS' assumed return of 7.00%, the System's investments need to exceed the 10-year Treasury yield by 6.3%. Even though TRS had reduced its return assumption by 150 basis points over the period, it still had to take more investment risk in 2020 to meet its assumption than it did in 2006. Since 2020, yields on 10-year Treasury bonds have increased, reducing the expected risk premium needed to achieve the System's assumed return. Yields on 10-year Treasury bonds have been approximately 4% during 2024; therefore, the System's investments currently only need to exceed the 10-year Treasury yield by about 3% to achieve the 7.00% assumed return, which is the lowest expected risk premium over the last 20 years. If these higher Treasury bond yields persist, plans may be able to achieve the expected return with less exposure to investment risk. However, if these higher Treasury bond yields prove temporary, plans could quickly find the pressure returning to further reduce discount rates or increase their exposure to investment risk.



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2. *Inflation Assumption*

As recommended in Segal's June 18, 2024 Review, the inflation assumption was maintained at 2.50% for the draft June 30, 2024 Actuarial Valuation.

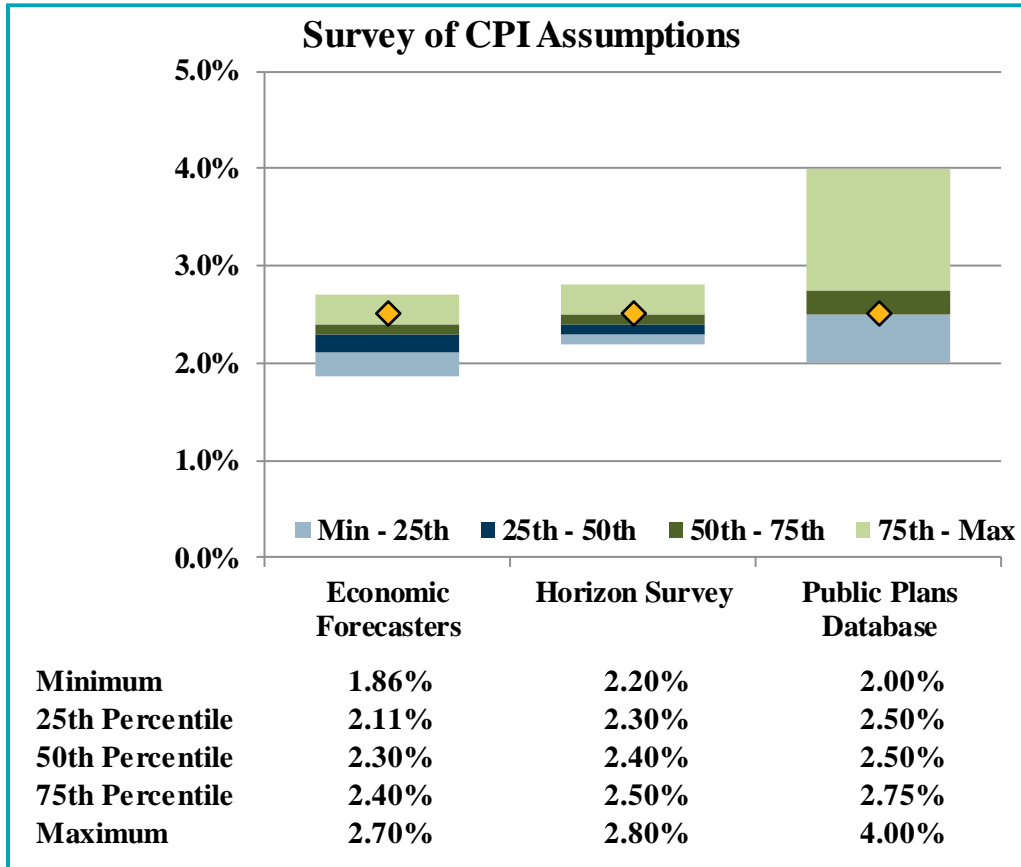
We find the 2.50% inflation assumption and the basis for setting it reasonable.

The items we considered and our rationale for concurring with the assumption are as follows:

- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), inflation will average between 1.8% and 3.0% (<http://www.ssa.gov/oact/tr/2024/tr2024.pdf>). Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.4%.
- The following chart shows the distribution of inflation expectations for the Third Quarter 2024 survey of professional economic forecasters published by the Philadelphia Federal Reserve, the 2024 Horizon survey of investment consultant capital market assumptions (20-year), and the 2023 inflation assumptions used by plans in the Public Plans Database compared to the TRS assumption (indicated by the gold diamonds). The assumption of 2.50% is near the middle of the range used by other public pension plans, and is at the 75th percentile of the ranges projected by investment consultants in the Horizon survey and by professional economic forecasters.

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3. *Salary (Annual Compensation) Increase Assumption*

As recommended in Segal's August 16, 2024 Experience Review, the salary increase assumption was modified for the draft June 30, 2024 actuarial valuation. The salary assumption, which is service based, ranges from 8.50% (at one-year of service) to 4.00% (at 20 or more years of service) and was lowered at one year of service and raised at higher service levels. The overall assumed rate of salary increase, including the inflation assumption of 2.50%, will average 5.00% per year, a net increase from the prior average expected rate of 4.87%.

We find the assumption to be reasonable.

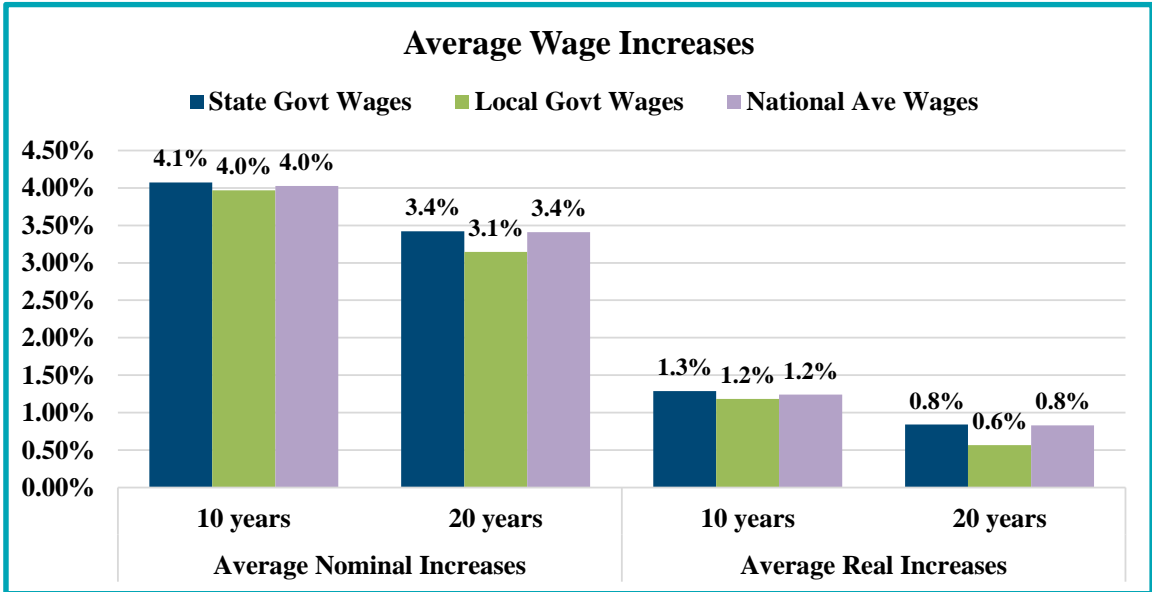
The items we considered and our rationale for finding the salary increase assumption to be reasonable are as follows:

- Based on the actuarial valuation reports, actual salaries have been higher than expected in each of the last three years. Based on the 3-year pattern of experience, the salary increase assumption was reduced in 2015, increased in 2018, reduced in 2021, and increased in 2024.
- To develop this assumption, Segal analyzed the real wage increase experience of the System over the prior three years (2021-2023), subtracting actual inflation of 2.56% for 2019-2021 from the actual salary increases, based on an assumed two-year lag between actual inflation and the corresponding salary increases. Segal developed an assumed real rate of increase for each service group that was generally between the prior assumption and the three-year experience. Then, Segal added its assumed inflation of 2.50% at the time to develop the nominal salary increase assumption.
- We expect the relationship between inflation and wage increases to be more stable over longer periods, but over short periods it can be volatile. For example, Segal's analysis assumed that the effect of the 9.06% inflation that occurred during 2022 was not yet reflected in the salary increases through June 30, 2023. Therefore, it is reasonable to assume that high inflation will emerge through higher salary increases over the next few years. However, Segal's recommended assumption does not anticipate higher salary increases over the next few years to reflect the 9% inflation that they assume has not yet impacted salary increases. Therefore, the System will experience liability losses over the next few years if the recent high inflation results in higher than expected salary increases. We note that there have been liability losses due to higher salaries than expected over the past two years, which could have been due to the high inflation from 2022.
- The following chart shows the average nominal and real increases in wages over the last 10 and 20 years for State governments, local governments, and National Average Wages. State and local government data is from the Quarterly Census of Employment

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and Wages as published by the Bureau of Labor Statistics. National Average Wages is published by the Social Security Administration.



- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), real wage differential will average somewhere between 0.53% and 1.74%. Under the intermediate cost projection, the Social Security Administration uses an assumption of 1.14%.

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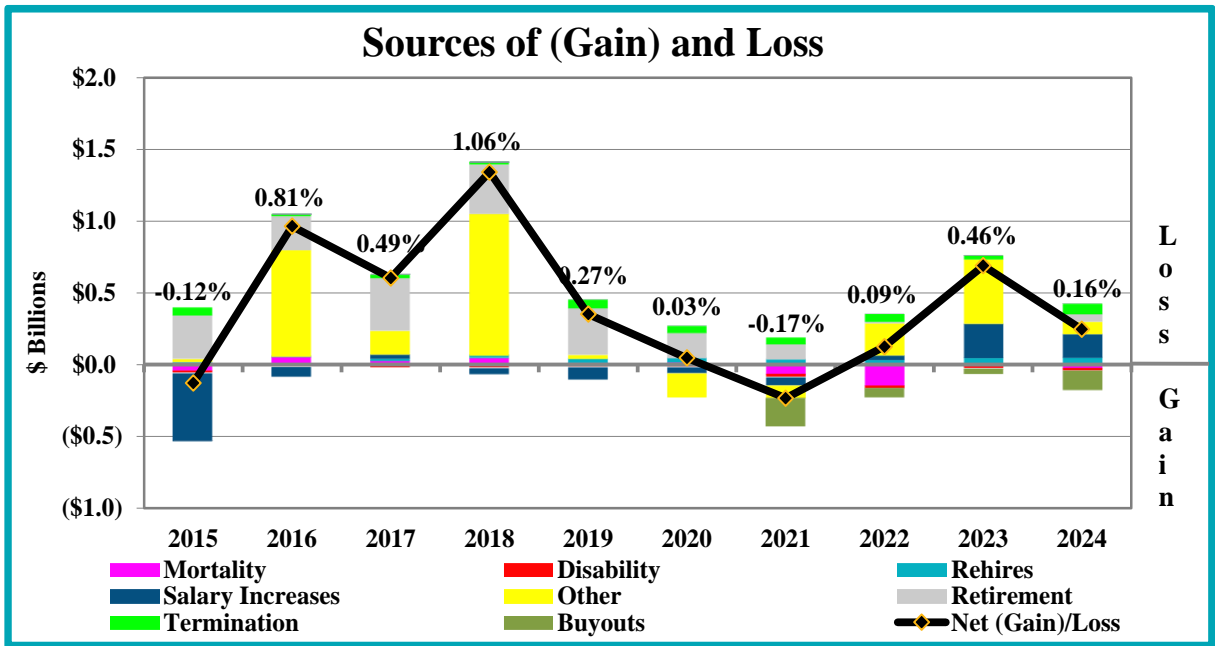
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B. Demographic Assumptions

All demographic assumptions were reviewed as part of an experience study with appropriate assumption changes adopted by the Board in August 2024.

In its annual actuarial valuation reports, TRS regularly reports sources of liability gains and losses. In the 2024 report, these are shown in Section 2 on page 41. In the chart below, we have collected similar data from TRS valuation reports dating back to 2015 and use these to present a historical review of past demographic and salary increase experience gains and losses.

The following chart shows the pattern of historical gains and losses attributable to eight different sources as shown in the legend. When the colored bar slices appear above zero on the Y-axis, they represent experience losses with the values representing the increases in liabilities over what was expected. When the bar slices are below zero, they represent experience gains with the values representing the reductions in the liabilities for that year versus what was expected. The net liability (gain)/loss is shown by the black line on the graph below. This net (gain)/loss as a percent of liability for each year is shown as the percentage above the bars.



The percentages shown above the bars refer to net (gain)/loss as a percentage of liability.

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Key observations from this chart are as follows:

1. Retirement experience generated consistent losses prior to the experience study performed in 2021. Since then, gains and losses due to retirement have been minor.
2. Termination and rehire experience have resulted in consistent losses over the past 10 years. Segal's analysis of termination experience is net of rehires, so those two buckets should be considered in aggregate.
3. The rehires category includes very small gains and losses due to new entrants.
4. In 2021, there was a noticeable gain due to the buyout program, but that gain was reduced by two thirds in 2022 and further reduced in 2023. However, the buyout program generated another noticeable gain in 2024.
5. Salary increases have generated significant liability losses over the past two years.
6. The “other” loss for 2016 is primarily due to the change in actuary, and the significant “other” losses for 2018 and 2023 is due to “programming enhancements” that affected a subgroup of members.

We reviewed the development of these assumptions based on the experience study dated August 16, 2024, and we have concluded all of the demographic assumptions are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4. We have comments on some specific assumptions below but do not believe they would have a material effect. A complete list of actuarial assumptions can be found in Appendix C.

During our review of the experience study dated August 16, 2024, we noted that Segal’s analysis of the demographic and salary scale assumptions only provided the experience detail in aggregate and not broken out by 5-year age or service bands. In order to properly review the recommended assumptions, specifically the materiality of the experience for each age/service band, **we recommend that Segal include additional detail (e.g., exposures, actual experience, and expected experience) by the relevant age and/or service buckets throughout their experience study, similar to what was shown in the 2021 experience study report.** (Recommendation #7)

1. Rates of Mortality

Segal applied adjustment factors to the actual mortality experience in 2020, 2021, and 2022 based on data from the CDC related to observed “excess mortality” to approximate the level of mortality that would have been experienced in the absence of the COVID-19 pandemic. While we have seen various approaches and considerations for handling mortality experience during the pandemic, we have not seen an adjustment using the CDC’s “excess mortality” data

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because the CDC's data is based on the total population and not a retiree population that has better access to healthcare. Therefore, we believe Segal's adjustments may be overstating the impact COVID had on TRS' mortality experience. However, if their approach overstated the impact of COVID, the resulting mortality assumptions are more conservative (i.e., they are expecting members to live longer.)

Normally, a published mortality table is adjusted for a system's individual experience by multiplying the mortality rate for each age by a constant factor such that the shape of the curve of mortality rates from the published table is maintained. Segal, however, applied different factors for different groups of ages. For example, the healthy female retiree mortality table uses a 91% adjustment factor for ages under 75 and a 103% adjustment factor for ages 75+. TRS has sufficient data, and Segal provides a breakdown of experience based on the two age groups they selected to justify the different factors. We suggest that in future studies, Segal provide the data on 5-year age groups so that the rationale for the particular age groups Segal selected is clearer. In addition, we suggest Segal consider a transition period between the factors so that mortality rates do not jump abruptly when switching from one factor to another.

2. Rates of Termination

We support Segal's recommendation of reducing termination rates indicated by the most recent experience. However, due to the consistent liability losses from termination and rehire experience, we expected a larger change to the termination rates to reduce future liability losses due to termination and rehire experience. Segal's recommendations are generally in between the current assumption and actual experience over the past three years. However, the recommended rates for males with less than 5 years of service at ages 55-59 was increased to closely match actual experience. We cannot determine whether this age band has a material impact on the System due to the limited details provided. Therefore, **we recommend that Segal include additional detail (e.g., exposures, actual experience, and expected experience) by the relevant age and/or service buckets throughout their experience study, similar to what was shown in the 2021 experience study report.** (Recommendation #7)

3. Rates of Retirement

The 100% retirement age for members hired before January 1, 2011 with 30+ years of service is past age 70 (age 72 for members with 30-33 years of service and age 75 for members with 34+ years of service) while it is age 70 for the same members hired on or after January 1, 2011. It has become increasingly more common to have 100% retirement ages that are beyond age 70 and we acknowledge that there is very little retirement experience available for members hired on or after January 1, 2011. However, we suggest that Segal consider using the same 100% retirement age regardless of when the member was hired.

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4. Percent Married

The lack of spouse information is a concern because this assumption is being applied not only to non-retired members but also to retired members with missing spouse information. Therefore, this assumption has a larger impact on the valuation results than most Systems that have spouse information for current retirees.

5. Elected Form of Payment

This assumption was not reviewed in the 2024 experience study. However, there is probably limited data available given the lack of spouse information available.

6. Optional Service Purchases

We did not see the basis for applying the 25% factor to Substitute, Part-time, and Hourly-paid members. However, they make up a relatively small portion of the System's liability.

7. Sick Leave Service Credit

We did not see the basis for applying the 25% factor to Substitute, Part-time, and Hourly-paid members. However, they make up a relatively small portion of the System's liability.

8. Administrative Expenses

This assumption was not reviewed in the 2024 experience study. The actual administrative expenses during the year ended June 30, 2024 were \$36,932,370 and the assumption is that the expenses will increase to \$49,915,900 for the year ending June 30, 2025, \$59,339,056 for the year ending June 30, 2026, and increase with payroll increases thereafter. Therefore, the administrative expense is expected to increase over 35% from FY 2024 to FY 2025 and over 18% from FY 2025 to FY 2026. **While it is a small component of the overall cost, we recommend that Segal provide a rationale for the significant expected increase in administrative expenses compared to the most recent actual administrative expenses.** (Recommendation #8).

9. 2.2 Upgrade Assumption

This assumption was not reviewed in the 2024 experience study, so we cannot determine whether it is reasonable.

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10. New Entrant Assumption for Projections

The State contribution is based on the projected actuarial liability as of June 30, 2045. A critical set of assumptions used in projecting the actuarial liability are the demographic characteristics of projected new entrants. Segal assumes that the active population will remain constant and describes the demographic characteristics of projected new hires on page 111 of the report, which are based on new entrants over the most recent five-year period.

New entrant salaries are assumed to increase at 2.50% each year in step with the inflation assumption.

The demographic detail provided on new entrants is helpful but doesn't provide much information about how the active population's demographic characteristics are assumed to change over time. It would be helpful, for example, to provide the average age and service for the active population as an extension of Table 10. This information is a standard output of most actuarial projection software. Historically, both the average age and service of the active population have been steadily increasing. It isn't clear whether the new entrant assumptions will continue this trend, stabilize it, or reverse the trend. These demographic changes can have a material impact on the projections, and as a result, on the State's contribution. **We continue to recommend that Segal provide additional information in the valuation report about the projected demographics of the active population used in its projection such as the average age and service of the active population in each year of the projection (Recommendation #5).**

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C. Funding Method

Actuarial funding methods consist of three components: (1) the actuarial cost method, which is the attribution of total costs to past, current, and future years; (2) the asset valuation method (i.e., asset smoothing); and (3) the amortization method.

1. Actuarial Cost Method

The System uses the Projected Unit Credit (PUC) cost method to assign costs to years of service, as required under the Pension Code (40 ILCS 5/16). **We have no objections with respect to using the PUC method, although we, as Segal does, would prefer the Entry Age Normal (EAN) cost method as it is more consistent with the requirement in 40 ILCS 5/16 -158 for level percentage of pay funding.**

Under the PUC method, which is used by some public sector pension funds, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the valuation date but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the actuarial liability for a given active participant. Under the PUC cost method, the value of an active participant's benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. While the PUC method is not an unreasonable method, as a result of this pattern of benefit value increasing, more plans use the EAN cost method to mitigate this effect. It should also be noted that the EAN cost method is the required method to calculate liability for GASB Nos. 67 and 68.

2. Asset Valuation Method

The Actuarial Value of Assets for the System is a smoothed market value. Unanticipated changes in market value are recognized over five years in the Actuarial Value of Assets. The primary purpose for smoothing out gains and losses over multiple years is so fluctuations in the contributions will be less volatile over time than if based on the Market Value of Assets.

The 2024 Public Retirement Systems Study by the National Conference on Public Employee Retirement Systems (NCPERS) survey of 157 public retirement funds found that the majority of plans responding to the survey have a five-year smoothing period.

Smoothing the market gains and losses over a period of five years to determine the Actuarial Value of Assets is a generally accepted approach in determining actuarial cost, and we concur with its use.

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3. *Amortization Method*

The mandated State contribution is based on a determination of the level percentage of payroll that is expected to achieve a 90% funded ratio in 2045. While not a traditional amortization method, this methodology effectively amortizes a portion of the Unfunded Actuarial Liability over the remaining period until 2045, which is currently 21 years.

One of the principles of funding public plans identified by the American Academy of Actuaries is that there should be “a plan to make up for any variations in actual assets from the funding target within a defined and reasonable time period.” Because it only targets 90%, the State method does not include a plan to achieve the funding target over any period of time.

Typical public plan amortization methods are designed to increase each year by expected payroll growth. Under the State mandated method, however, the effective amortization payment increases each year by more than the expected growth in payroll. As a result, the State mandated method defers payments on the Unfunded Actuarial Liability further into the future than under typical public plan amortization methods.

Finally, as the remaining period to achieve 90% funding shortens, the State mandated method will also produce more volatile contributions. Instead of a single fixed period, typical public plan amortization methods use layered amortization bases such that new assumption changes and experience gains and losses are amortized over a new period (e.g., 20 years) while the remaining period for the prior amortization layers becomes one year shorter.

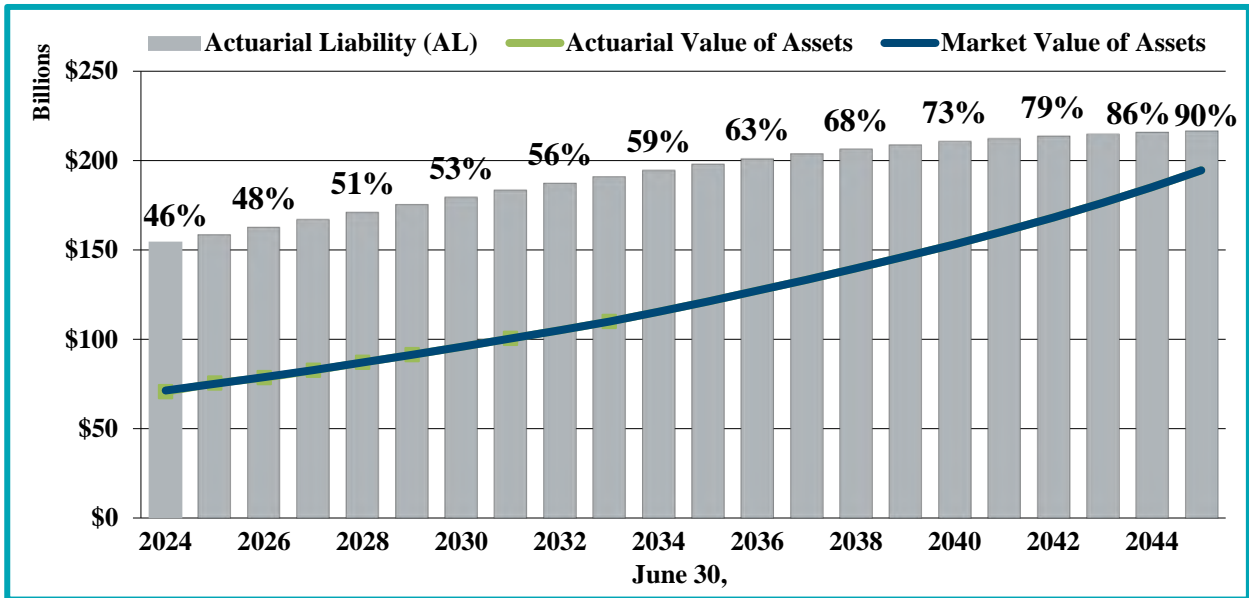
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This section reviews the projections contained in the draft June 30, 2024 Actuarial Valuation of TRS. These projections are fundamental to the development of the required State contribution calculated under the current statutory funding requirement.

The following graphs are independent approximations of the projections performed by the State actuary to verify that the System's funding projections are reasonable. They do not reflect all the precision of the projections applied by the System's actuary, but instead they are intended to verify the reasonableness of the Modeling done by the System's actuary.

The graph below shows our projection of the expected future liabilities and assets in the System through 2045. As seen in the graph on page 17 and the detailed figures in Section 5 of the draft June 30, 2024 Actuarial Valuation, the majority of the funding of the System occurs in the later years of the projection. The **lines show the projected assets** (market value and actuarial value), and the **bars show the projected liabilities** of the System. The funded ratio is shown at the top of the bars. For example, in 2034, the funded ratio is projected to be approximately 59% with assets being approximately \$115 billion and liabilities being approximately \$194 billion.

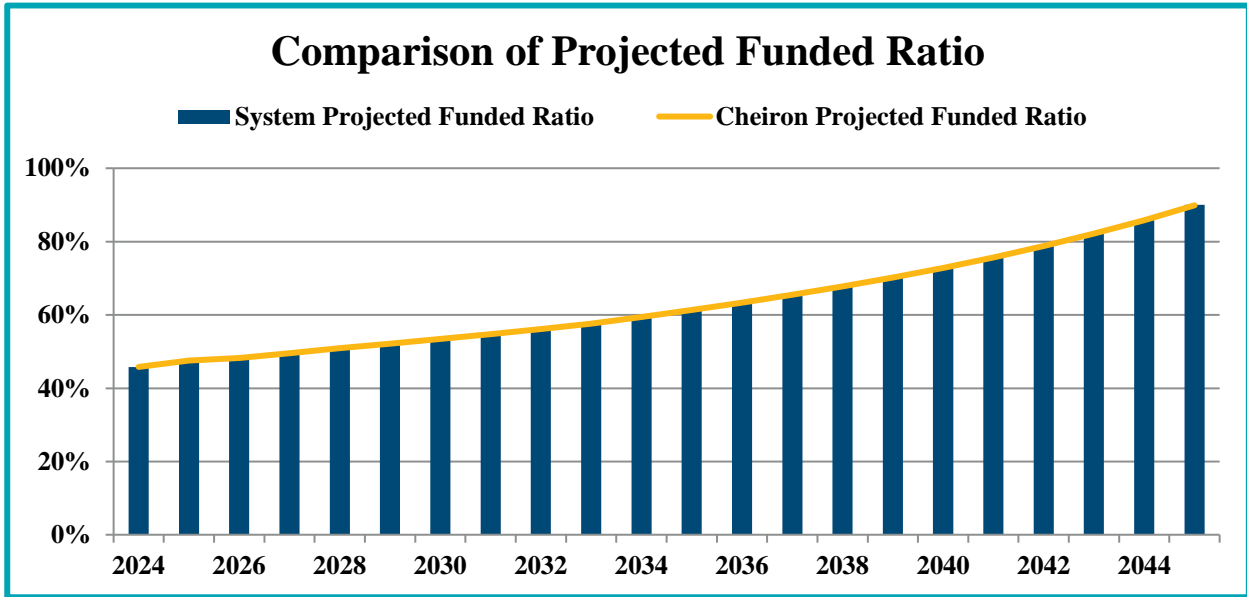


Source: Cheiron projection analysis.

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When we compare, in the chart below, our projected funded ratio (yellow line) against the results shown in the draft June 30, 2024 Actuarial Valuation (blue bars), **we find a close match in expected funded ratio**. This close match of the funded ratio indicates that the projections done by the System's actuary are reasonable.

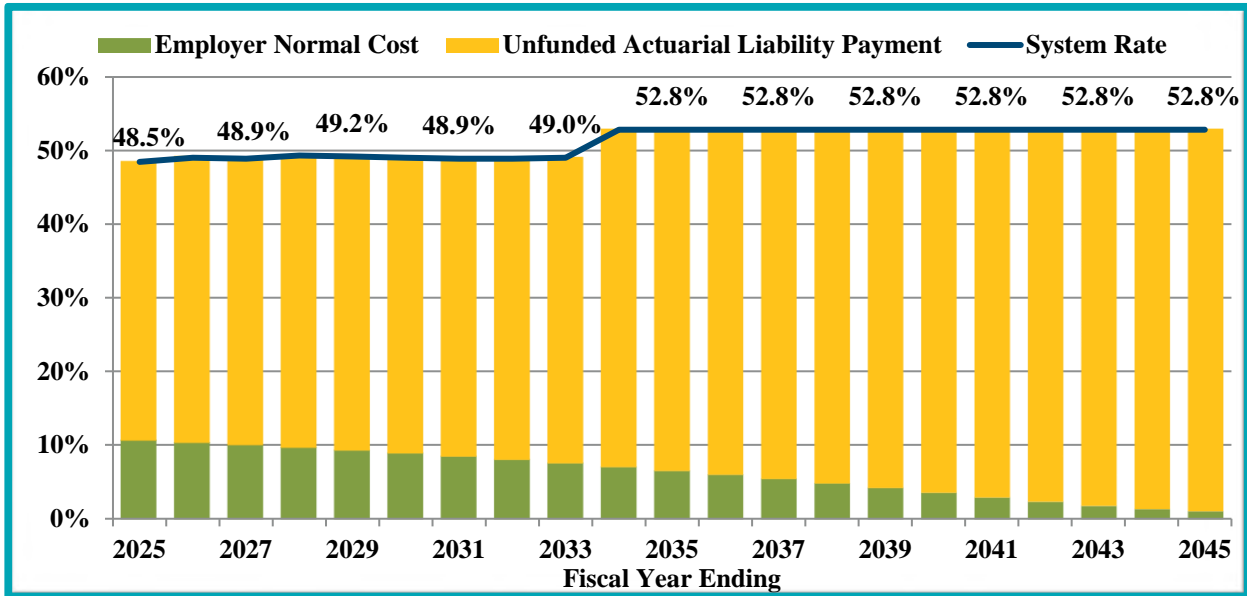


Source: Cheiron projection analysis.

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SECTION IV – PROJECTION ANALYSIS

The following graph shows the expected contributions calculated under the statutory method. The values for the fiscal year ending 2025 were set based on the June 30, 2023 Actuarial Valuation. The current valuation is the basis for setting the rates starting July 1, 2025 (Fiscal Year Ending June 30, 2026). The contribution requirement has two components: 1) the employer normal cost, which is the value of the amount of benefits to be accrued by participants in the upcoming year, less employee contributions, based on the statutory funding method; and 2) an amortization payment on the unfunded liability. The normal cost amounts are shown by the green bars and the amortization payments of the Unfunded Actuarial Liability (UAL) by the yellow bars. The percentages shown are the total contribution rates as a percentage of payroll calculated by Cheiron, which are equal to the sum of the bars. The graph shows that larger percentages of the total contribution are being made toward the UAL payments later in the period. The blue line shows the projected contribution rates as percentages of payroll from the System actuary's draft June 30, 2024 Actuarial Valuation. The difference between Cheiron's approximation and the System's projections is the difference between the top of the bars and the line. In this instance, there is virtually no difference. The contributions are being limited by the maximum contribution described in the General Obligation Bond Act prior to 2033, which is why the rate increases after 2033.



Source: Cheiron projection analysis.

Our conclusion is that **the projections performed by the System's actuary are reasonable.**

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

In this section, we examine the adequacy of the funding for the System, including funded ratio, the sources of changes in the Unfunded Actuarial Liability (UAL), projections of the UAL, and statutory funding requirements compared to contributions needed to pay down the UAL.

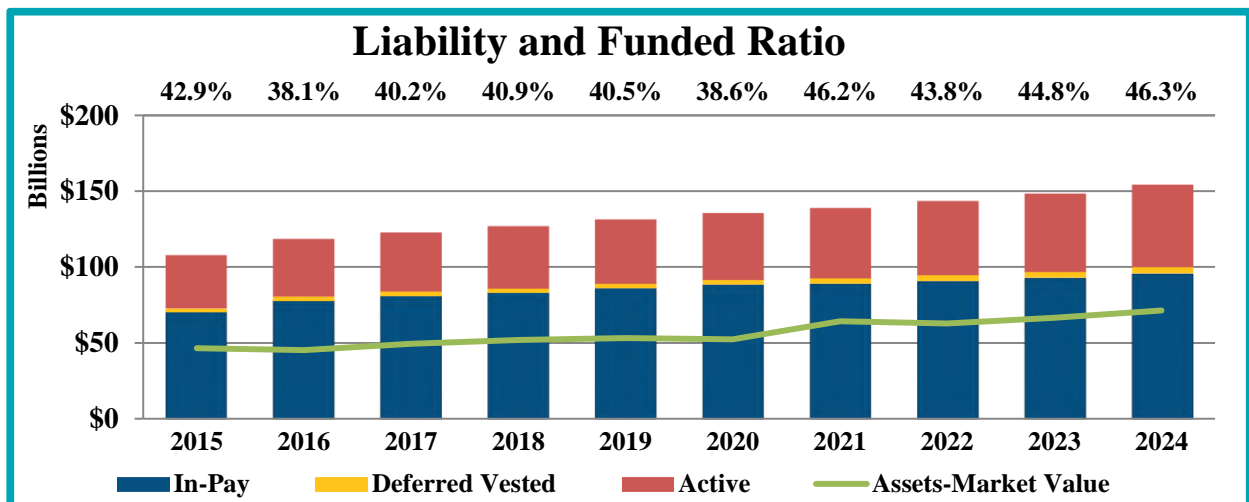
The actuarial valuation report prepared by Segal includes traditional actuarial measurements as well as additional stress testing and projections based on our prior recommendations. Given the unique and substantial funding challenges faced by the Illinois pension systems, this section on funding adequacy supplements the information from the Segal report to better inform the legislature and other stakeholders about the adequacy of the System’s funding.

System Funded Ratio

The first funding adequacy measure is the historical trend of the System’s funded ratio for the past 10 years. Funded ratio for this purpose is defined as the ratio of the Market Value of Assets to the actuarial liability. The chart below shows that TRS’ funded ratio over the last decade has fluctuated between 38.1% and 46.3%. The current funded ratio of 46.3% is above the 2015 level of 42.9%. In addition to showing the funded ratio, this chart also shows the breakdown of the Plan’s liabilities by membership status:

- Active liability – the liability (attributable to service already performed) for future payments to members who are currently working in the System,
- Deferred Vested liability – the liability for future payments to members who are no longer working in the System but due a benefit, and
- In-Pay liability – the liability for future payments to retirees and beneficiaries who are currently receiving benefits.

This breakdown shows that today plan assets only cover about 75% of the liabilities for just those members currently receiving benefits.



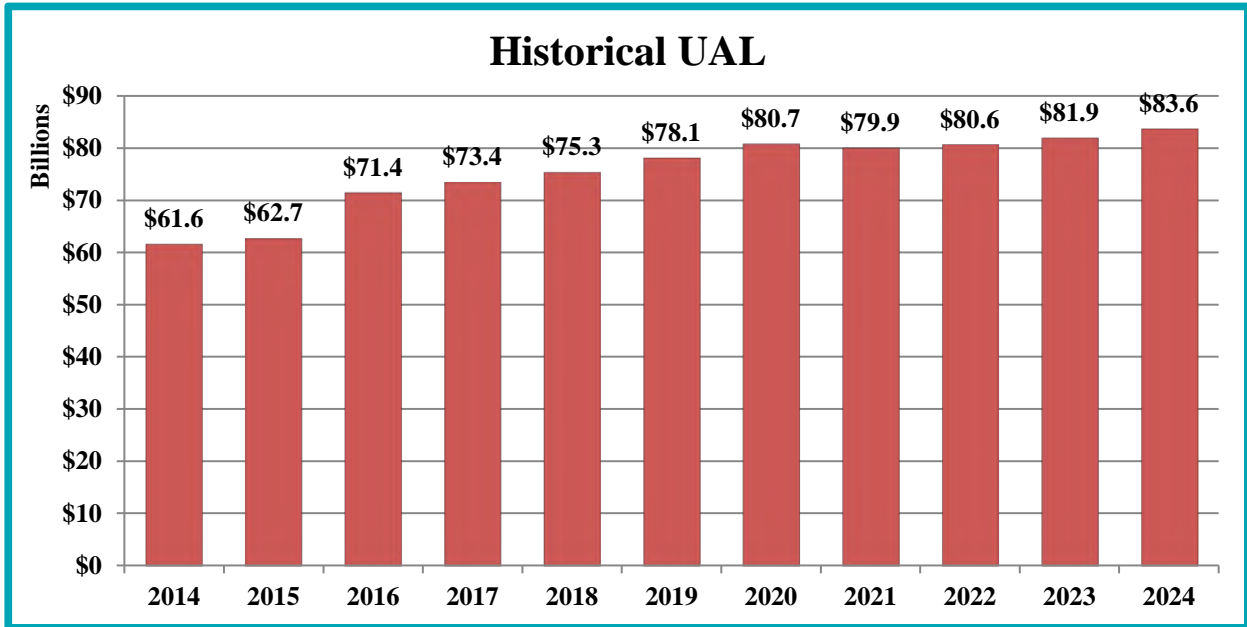
Source: Cheiron analysis of funding adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Sources of Changes in the UAL

As shown in the chart below, TRS' Unfunded Actuarial Liability (UAL) has grown from about \$61.6 billion in 2014 to \$83.6 billion in 2024, an increase of \$22.0 billion. In order to understand how to reverse this trend, it is important to understand the sources contributing to it.



Source: Cheiron analysis of funding adequacy.

The changes to the UAL from June 30, 2014 to June 30, 2024 can be separated into the following components:

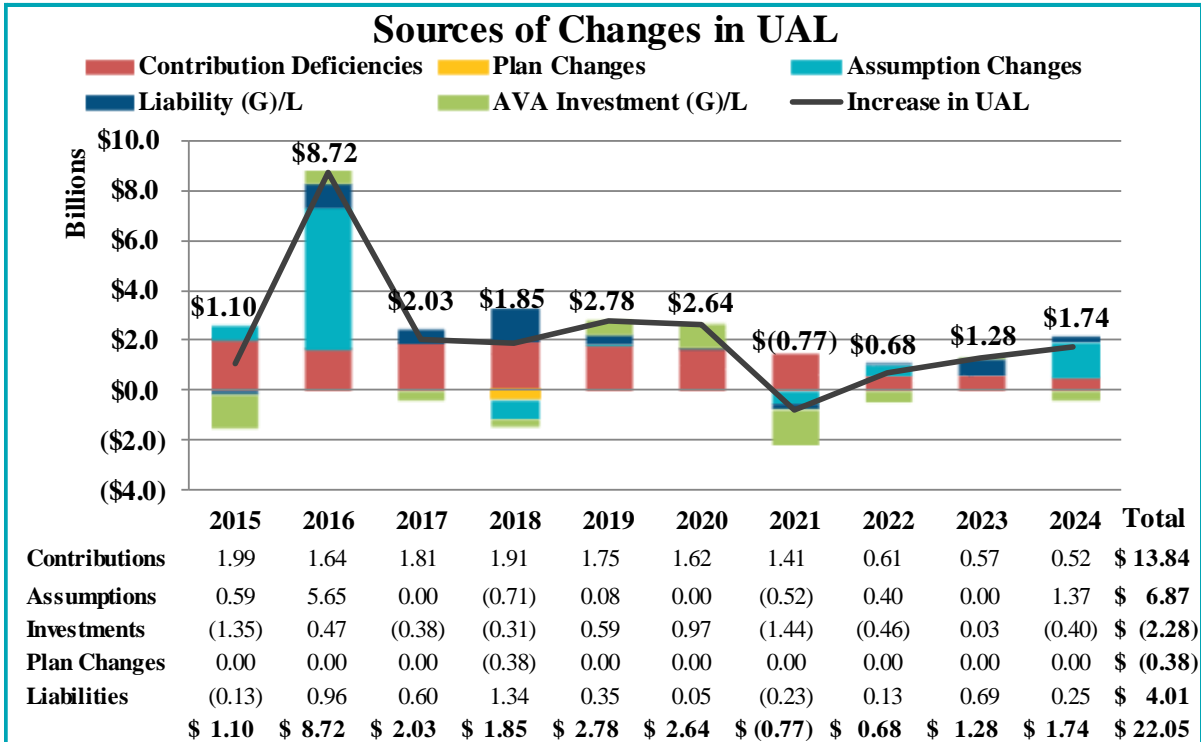
- **Contribution Deficiencies** – Contributions that are less than the tread water contribution cause the UAL to increase. The tread water contribution consists of two components: the normal cost, which is the cost of benefits earned in a given year, and the interest on the Unfunded Actuarial Liability. This sum is referred to as the tread water contribution because it is the contribution necessary so that the UAL will remain constant, or “tread water” (absent experience gains or losses). The differences between actual contributions and the tread water contributions increased the UAL by \$13.84 billion over this period.
- **Assumption Changes** – Changes to actuarial assumptions as the System updated expectations, primarily on future investment returns and life expectancy. A positive aspect of the UAL increases due to assumption changes is that they are expected to result in liability measurements that more accurately reflect future expectations. Over this period, assumption changes have increased the UAL by \$6.87 billion.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

- **Plan Changes** – Modifications to the design of the Plan. Since most of the changes to the System’s plan affect only future benefits, the impact has been negligible during this period, reducing the liability by \$0.38 billion over this period.
- **Liability (Gain) or Loss** – Changes in the UAL due to liability experience (i.e., mortality, terminations, salary increases, etc.). These were generally small but increased the UAL by \$4.01 billion over this period.
- **AVA (Actuarial Value of Assets) Investment (Gain) or Loss** – Net investment gains or losses due to assets earning more or less than assumed. These have decreased the UAL over this period by \$2.28 billion.

The chart below shows the changes in UAL each year broken into these five components. The sum of all the components, as the total change in UAL, is shown as the black line. Values of each component as well as total by year are shown in the chart along with the totals for the period.



Source: Cheiron analysis of funding adequacy.

We expect that this chart will help stakeholders understand the sources of growth in the UAL over the past decade and inform discussions about the current funding requirements and adequacy.

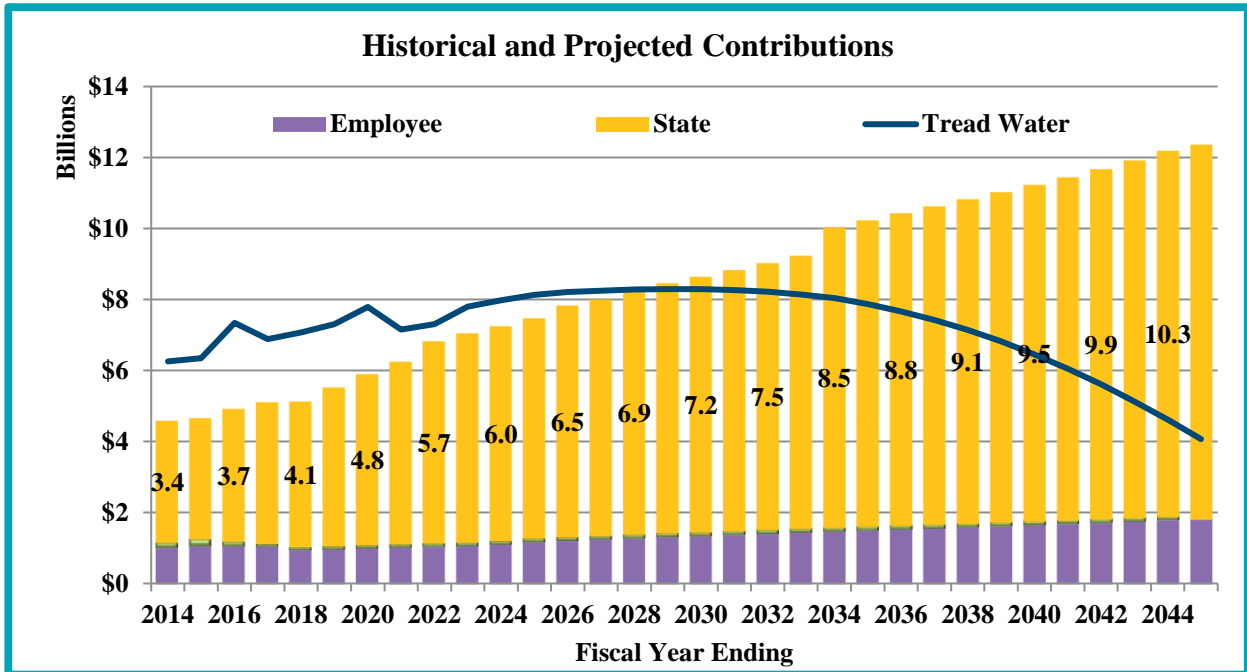
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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Actual Contributions Compared to Tread Water Contribution

One of the historical sources of the increase in UAL is due to actual contributions to the System being less than the tread water contribution (the amount needed to prevent the UAL from increasing if all assumptions are met). These contribution deficiencies have added between \$0.5 and \$2.0 billion to the UAL each year over the historical period shown.

As the chart below shows, actual contributions have been significantly less than the tread water cost. Each year that total contributions remain below the tread water cost (blue line), the UAL is expected to grow. As shown in the graph below, the contributions from the State will need to increase before the total contribution reaches the tread water contribution and begins to pay down the UAL based on the Market Value of Assets.

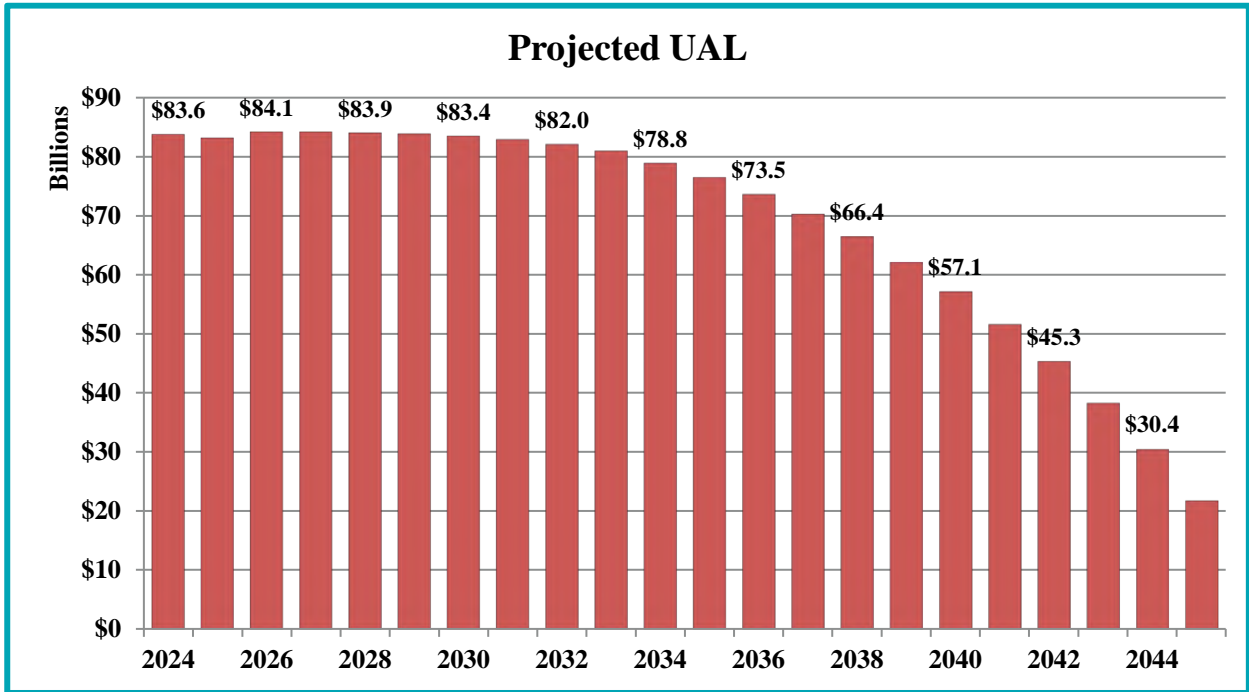


Source: Cheiron analysis of funding adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

The next chart shows that if the statutory contributions continue to be made each year and all other assumptions are met, the UAL is projected to decline from \$83.6 billion in 2024 to \$21.7 billion in 2045. As illustrated in the chart below, the UAL is projected to slightly increase through 2027 before the UAL starts to decline.



Source: Cheiron analysis of funding adequacy

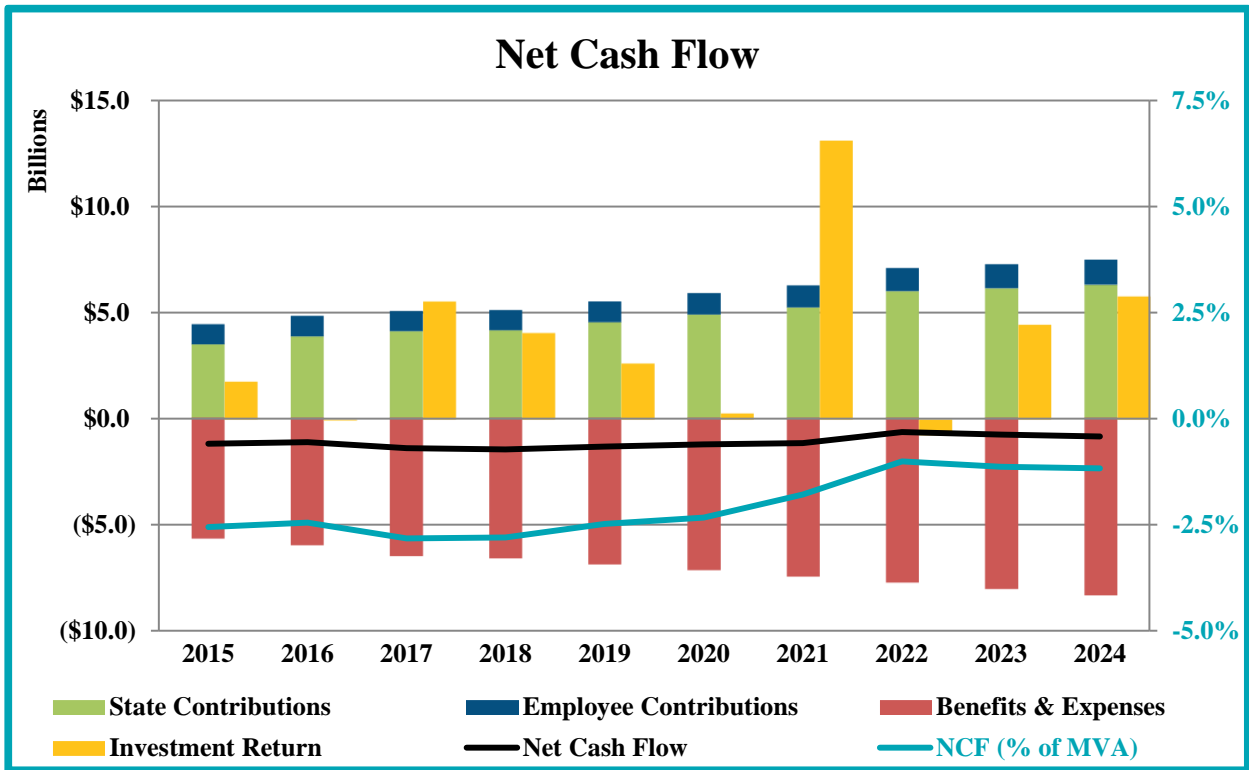
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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Net Cash Flow Analysis

The Plan's net cash flow is defined as State and employee contributions less benefit payments and administrative expenses. The more negative net cash flow is as a percentage of the Plan's assets, the more vulnerable the Plan is to market downturns. This is because when a pension plan has more payouts than contributions and suffers an investment loss, it is left with fewer assets to invest and recapture during a recovery.

As shown in the chart below, TRS has mildly negative net cash flow as a dollar amount (black line) and as a percentage of the Market Value of Assets (teal line, right axis). If contributions increase as quickly as benefit payments, the net cash flow will remain stable. But if contributions do not continue to grow either because the plan has become better funded or because the expected contributions are not made, negative net cash flow may become a more significant issue, therefore it should continue to be monitored.



Source: Cheiron analysis of funding adequacy.

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

Response to Recommendations in 2023

In the State Actuary’s Preliminary Report on the Teachers’ Retirement System of Illinois dated December 18, 2023, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in either the System’s comments last year or in this year’s draft June 30, 2024 Actuarial Valuation.

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period .	Not Implemented	<p>The System has adopted a funding policy referred to as the <i>Board-Adopted Actuarial Funding Policy</i> that would meet the recommendation; however, the actual funding of the System is based on State statute and a change in the funding method and funding policy would require a statutory change.</p> <p>The <i>Board-Adopted Actuarial Funding Policy</i> targets full funding after 20 years and is considered actuarially sound.</p> <p>Recommendation repeated.</p>
2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.	Not Implemented	<p>This period is determined by Public Act 100-0023 and would require a statutory change.</p> <p>Recommendation repeated.</p>
3. As required by section 3.3 of ASOP 51, we recommend that Segal provide an assessment for each of the key risks they have identified. In particular, Segal identified a new key risk, Economic Risk, but they did not provide any assessment of Economic Risk.	Not Implemented	<p>Segal has not assessed economic and other related risks beyond listing these potential implications and pointing to their assessments of other risks. Since Segal separately identified “Economic and Other Related Risks”, they should provide a separate assessment of this risk. In addition, Segal removed their assessment of longevity risk.</p> <p>Recommendation modified.</p>

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY'S REPORT

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
4. As required by section 3.19 of ASOP 4, we recommend that Segal disclose how long before the State Mandated Contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability and disclose whether the funding policy is significantly inconsistent with accumulating assets adequate to make benefit payments.	Not Implemented	Segal has not disclosed how long before the State Mandated Contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability nor have they disclosed whether the funding policy is significantly inconsistent with accumulating assets adequate to make benefit payments. Recommendation continued.
5. We continue to recommend that Segal provide additional information in the valuation report about the projected demographics of the active population used in its projection such as the average age and service of the active population in each year of the projection.	Not Implemented	Segal has not disclosed the average age and service of the active population in each year of the projections so it would be clear how the new entrant assumption is affecting the demographics of the future active population. Recommendation modified.
6. We recommend the TRS Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.	Implemented	We will continue to include the recommendation to review economic assumptions each year. Recommendation continued.
7. We recommend that Segal increase the Full-Time future service accrual rate assumption to 1.0 years of service and consider non-full-time member future service accrual rates that reflect recent experience on an individual basis.	Implemented	In 2024 Actuarial Valuation, Segal revised its assumptions based on the Experience Review dated August 16, 2024 to increase the full-time future service accrual rate assumption to 1.0 years of service and actual prior year service accrual for substitute, part-time, and hourly members Recommendation removed.

Chapter Two

Preliminary Report on the State Universities Retirement System

In accordance with 30 ILCS 5/2-8.1, Cheiron, the State Actuary, submitted a preliminary report to the Board of Trustees of the State Universities Retirement

System (SURS) concerning proposed certifications of required State contributions submitted to Cheiron by the Board. The preliminary report was submitted to SURS on November 26, 2024. The preliminary report was based on Cheiron's review of actuarial assumptions included in SURS' 2024 Actuarial Valuation Report.

Following is Cheiron's final preliminary report on the State Universities Retirement System. SURS' written response, provided on December 11, 2024, can be found in Appendix D.

OVERVIEW**STATE UNIVERSITIES RETIREMENT SYSTEM**

as of June 30, 2024

Actuarial accrued liability	\$52,825,365,000
Actuarial value of assets	<u>\$24,312,596,855</u>
Unfunded liability	\$28,512,768,145
Funded ratio	46.0%
Employer normal cost	\$460,200,000
State contribution (FY26)	\$2,322,832,000
Active members	76,637
Inactive members	103,041
Current benefit recipients	<u>73,303</u>
Total membership	252,981
Interest rate assumption	6.50%
Inflation assumption	2.40%
Actuarial cost method	Projected Unit Credit
Asset valuation method	5-year Smoothing
Executive Director	Suzanne Mayer
Actuarial Firm	Gabriel, Roeder, Smith & Company

Source: June 30, 2024 SURS actuarial valuation report.

December 13, 2024

Mr. Frank Mautino
Auditor General
400 W. Monroe Street
Springfield, Illinois 62704

Board of Trustees
State Universities Retirement System of Illinois
1901 Fox Drive
P.O. Box 2710
Champaign, Illinois 61825-2710

Dear Trustees and Auditor General:

In accordance with the Illinois State Auditing Act (30 ILCS 5/2-8.1), Cheiron is submitting this preliminary report concerning the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS), of the required State contribution to the State Universities Retirement System of Illinois (SURS or System) for Fiscal Year 2026.

In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law. We note that the history of inadequate funding has resulted in current and future contribution levels, measured as a percentage of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings and recommendations. Section III provides the supporting analysis for those findings and presents more details on our assessment of the actuarial assumptions and methods employed in GRS's Actuarial Certification, as well as our assessment of GRS's determination of the required State contribution for Fiscal Year 2026. Section III also includes comments on other issues impacting the funding of the State Universities Retirement System, including the implications of Article 15 of the Illinois Pension Code, which establishes the statutory minimum funding requirements for the System. Section IV reviews the projections contained in the draft June 30, 2024 Actuarial Valuation. Finally, Section V provides an analysis of funding adequacy.

In preparing this report, we relied on information (some oral and some written) supplied by SURS and GRS. This information includes actuarial assumptions and methods adopted by the SURS Board, plan provisions, the draft June 30, 2024 Actuarial Valuation, the 2024 Experience Review Report, the August 30, 2024 letter on buyout assumptions, the Meketa 2024 Asset-Liability Study,

2024 minutes of the SURS Board of Trustee meetings, and various memos prepared by the System’s advisors, staff, and Executive Director. A detailed description of all information provided for this review is contained in Appendix B.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Office of the Auditor General and the State Universities Retirement System of Illinois for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron

SIGNED ORIGINAL ON FILE

William R. Hallmark, ASA, EA, FCA, MAAA
Consulting Actuary

SIGNED ORIGINAL ON FILE

Coralie A. Taylor, FSA, EA, FCA, MAAA
Consulting Actuary

SIGNED ORIGINAL ON FILE

Matthew Wells, FSA, EA, MAAA
Associate Actuary

**THE STATE ACTUARY’S PRELIMINARY REPORT ON THE
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SECTION I – REPORT SCOPE

Illinois Public Act 097-0694 (the Act) amended the Illinois State Auditing Act (30 ILCS 5/2-8.1) and requires Cheiron, as the State Actuary, to review the actuarial assumptions and valuation of the State Universities Retirement System of Illinois (SURS or System), and to issue to the SURS Board this preliminary report on the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contributions for Fiscal Year (FY) 2026. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the SURS Board to consider before finalizing its certification of the required State contribution for FY 2026.

While the Act states that just the actuarial assumptions and valuation are to be reviewed, we have also reviewed the actuarial methodologies (funding and asset smoothing methods) employed in preparing the Actuarial Certification, as these methods can have a material effect on the amount of the State contribution being certified. Finally, we have offered our opinion on the implications of Article 15-155 of the Illinois Pension Code, which impacts the contribution amount certified by GRS.

In conducting this review, Cheiron reviewed the draft June 30, 2024 Actuarial Valuation prepared by GRS, the 2024 Experience Review Report, the August 30, 2024 letter on buyout assumptions, the Meketa 2024 Asset-Liability Study, 2024 minutes of the SURS Board of Trustees meetings, and various memos prepared by the System’s advisors, staff, and Executive Director. The specific materials we reviewed are listed in Appendix B.

In addition to reviewing the actuarial certification of the required State contribution to SURS, the Act requires the State Actuary to conduct a review of the “actuarial practices” of the Board. While the term “actuarial practices” was not defined in the Act, we continue to interpret this language to mean that we review: (1) the use of a qualified actuary (as defined in the Qualification Standards of the American Academy of Actuaries) to prepare the annual actuarial valuation for determining the required State contribution; and (2) the conduct of periodic formal experience studies to justify the assumptions used in the actuarial valuation. In addition, we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2024 Actuarial Valuation.

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SECTION II – SUMMARY OF RECOMMENDATIONS

This section summarizes recommendations from our review of the actuarial assumptions and methods employed in the draft June 30, 2024 Actuarial Valuation of SURS as well as the “actuarial practices” of the SURS Board. Section III of this report provides detailed analysis and rationale for these recommendations.

Proposed Certification of the Required State Contribution

Gabriel, Roeder, Smith & Company (GRS) has determined that the FY 2026 required State contribution calculated under the current statutory funding requirements is \$2,322,832,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and have reviewed the assumptions on which it was based. We have accepted GRS’s 2024 actuarial liability as well as the annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions.

State Mandated Funding Method

1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State’s funding policy to require that the contribution impact of all assumption changes be phased-in over a five-year period.

1. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing this phase-in period is under the jurisdiction of State law and not the Retirement System.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

30 ILCS 5/2-8.1 requires the State Actuary to identify recommended changes in actuarial assumptions that the SURS Board must consider before finalizing its certification of the required State contribution. We have reviewed all the actuarial assumptions used in the draft June 30, 2024 Actuarial Valuation and conclude that the recommended assumptions are reasonable in general, based on the evidence provided to us.

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SECTION II – SUMMARY OF RECOMMENDATIONS

Recommended Changes for Future Valuations

2. We recommend the SURS Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.

GASB 67 and 68

The 2024 SURS GASB 67 and 68 information was provided in a separate report. We find that the assumptions and methods used to prepare the 2024 SURS GASB 67 and 68 schedules are reasonable based on the evidence provided to us.

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SECTION III – SUPPORTING ANALYSIS

In this section, we provide detailed analysis and supporting rationale for the recommendations that were presented in Section II of this report.

Proposed Certification of the Required State Contribution

As stated in our summary of recommendations in Section II, we have verified the arithmetic calculations made by GRS to develop the required State contribution, reviewed the assumptions on which it is based, and accepted GRS’s 2024 actuarial liability as well as the annual projections of future payroll, total normal costs, benefits, expenses, and total contributions. However, in accordance with 30 ILCS 5/2-8.1, our review does not include a replication of the actuarial valuation results.

State Mandated Methods

The Illinois Pension Code (40 ILCS 5/15-155) establishes a method that does not adequately fund the System. This law requires the actuary to calculate the employer contribution as the level percentage of projected payroll that would accumulate assets equal to 90% of the Actuarial Accrued Liability in the year 2045 if all assumptions are met. This contribution methodology does not conform to generally accepted actuarial principles and practices. Generally accepted actuarial funding methods target the accumulation of assets equal to 100% of the Actuarial Accrued Liability, not 90%.

We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period (Recommendation #1).

The State Mandated Method is entering a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the Plan is ultimately 100% funded within a reasonable period.

The State Mandated Contribution for FY 2026 is sufficient to pay the employer normal cost, administrative expenses, and an amortization payment on the UAL that, if continued at the same percentage of payroll, would be expected to pay off the UAL in 25.6 years. According to “Actuarial Funding Policies and Practices for Public Plans” published by the Conference of Consulting Actuaries, an amortization period greater than 25 years but not greater than 30 years is considered a reasonable transition policy but is a “Non-Recommended Practice” on an ongoing basis. The declining normal cost combined with the State Mandated Method will produce shorter amortization periods and a reasonable contribution amount in the future.

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SECTION III – SUPPORTING ANALYSIS

The State Mandated Method will produce increasingly volatile contribution levels as the remaining period to achieve 90% funding shortens. Consequently, when changing to a reasonable ADC as described above, consideration should be given to a method, such as layered amortization, that produces more stable contribution requirements.

The GRS draft June 30, 2024 Actuarial Valuation includes a recommended funding policy that would contribute the normal cost plus an amortization payment that would seek to fully pay off the total unfunded accrued liability over a closed period by the year 2045. Under this policy, GRS calculated the fiscal year 2026 State contribution amount of \$2,680,476,000 (including Retirement Savings Plan (RSP) and Employer contributions). We agree that GRS's recommended funding policy is reasonable and conforms to a goal of full funding within a reasonable time period and with generally accepted actuarial principles and practices. However, it is not the only reasonable approach, and there are other reasonable funding policies that would result in a contribution closer to the State Mandated Contribution.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State's funding policy to require that the contribution impact of all assumption changes, including changes prior to P.A. 100-0023, be phased-in over a five-year period. As such, the Act delays the funding of the System. Assumption changes are intended to more accurately anticipate the obligations for funding based on the most recent experience analysis and forward-looking changes to future investment returns. However, only one-fifth of the impact of these changes are now recognized from the date of adoption. The remainder of the impact is recognized over four additional years such that the full impact is only recognized at the end of a five-year period beginning at the date of adoption. This phase-in provides time to adjust to a higher level of contributions. However, the Conference of Consulting Actuaries White Paper on Actuarial Funding Policies and Practices for Public Pension Plans recommends that the "phase-in period should be no longer than the time period until the next review of assumptions." **Because experience studies are performed every three years, we recommend the phase-in period for the impact of assumption changes be reduced to no longer than three years (Recommendation #2).**

Optional Hybrid Plan

P.A. 100-0023 created an Optional Hybrid Plan for current Tier 2 members and future new hires. The Optional Hybrid Plan consists of a reduced defined benefit plan and a defined contribution plan. Employers are required to contribute for each employee who participates in the Optional Hybrid Plan or Tier 2 in lieu of the Optional Hybrid Plan, the normal cost plus for fiscal year 2021 and after an additional 2% of pay.

GRS reflected the hybrid plan in the June 30, 2017 valuation by anticipating that future participants elect the Optional Hybrid Plan. However, in subsequent valuations, GRS has not reflected the Optional Hybrid Plan because SURS is still not moving forward with implementing the Optional Hybrid Plan until additional clarifying legislation is adopted. Based on consultation with SURS

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SECTION III – SUPPORTING ANALYSIS

staff, GRS has assumed that, when available, 0% of new members will elect the Optional Hybrid Plan. In the 2024 Experience Review Report, GRS studied Plan election and has adopted appropriate assumptions for the election of the Tier 2 Plan and the Retirement Saving Plan (formerly Self-Managed Plan). The assumption that no members will elect the Optional Hybrid Plan is reasonable based on the Plan design and the expectations of GRS and SURS staff.

Stress Testing

We anticipate GRS will continue to include stress testing of the System within the valuation report and explain the implications that volatile investment returns and a variety of other stressors (e.g., membership declines, lower salary growth, assumption changes) can have on future State costs. The tests illustrate the potential stresses on the System and its contributing sponsors so that an assessment of sustainability can be made.

We note that GRS has included stress testing scenarios in the final report for the last several years, but the stress testing section has not been included in this year’s draft report. Last year, a separate letter dated November 17, 2023, was provided that contained the stress testing that was ultimately included in Appendix J of the final report. We anticipate that similar stress testing will be included in the final June 30, 2024 Actuarial Valuation.

Actuarial Standard of Practice 51

Actuarial Standard of Practice (ASOP) 51 provides guidance to actuaries on the assessment and disclosure of risks to help readers of the actuarial valuation report “*understand the effects of future experience differing from the assumptions used*” and “*the potential volatility of future measurements resulting from such differences.*”

ASOP 51’s first requirement is to “*identify risks that, in the actuary’s professional judgment, may reasonably be anticipated to significantly affect the Plan’s future financial condition.*” GRS identified three sources of risk to SURS: investment risk, contribution risk, and salary and payroll risk.

ASOP 51 requires the actuary to assess each of the risks identified. While the assessment does not have to be quantitative, it does have to take into account the specifics of the individual plan. ASOP 51 also describes several quantitative methods that may be used to assess risk.

- Investment Risk. GRS included additional stress testing in last year’s final actuarial valuation report that adequately assessed the investment risk with various investment return scenarios.
- Contribution Risk. GRS discusses several issues with the statutorily required contribution amounts in the risk section as well as in other parts of the valuation report. The stress testing included in last year’s final actuarial valuation report adequately assessed the impact of a declining contribution base (i.e., payroll).

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- Salary and Payroll Risk. The stress testing included in last year’s final actuarial valuation report adequately assessed the salary and payroll risk with alternative projected decreases in the active population.

ASOP 51 requires the actuary to recommend a more detailed assessment of risks if it “*would be significantly beneficial.*” GRS notes that an additional risk assessment is outside the scope of the annual actuarial valuation. However, there is no indication of whether the actuary recommends such an assessment or considers the assessments included within the valuation sufficient.

ASOP 51 requires the actuary to “*calculate and disclose plan maturity measures that ... are significant to understanding the risks associated with the plan.*” GRS calculates and discloses the ratios of the market value of assets to payroll, Actuarial Liability to payroll, actives to retirees and beneficiaries, and net cash flow to Market Value of Assets. In addition, GRS calculates and discloses the duration of the present value of future benefits. These maturity measures are useful for understanding the risks to the plan.

ASOP 51 requires the actuary to “*identify and disclose relevant historical values of the Plan’s actuarial measurements that, in the actuary’s professional judgment, are significant to understanding the risks identified....*” GRS discloses a history of all of the maturity measures listed above as well as some additional metrics to assist with the understanding of the risks.

Actuarial Standard of Practice 4

Actuarial Standard of Practice No. 4 (ASOP 4) was amended and the changes first became effective for SURS’ actuarial valuations starting June 30, 2023. The revised ASOP added three requirements for actuarial valuation reports.

Calculate and disclose a Reasonable Actuarially Determined Contribution

GRS notes that the State Mandated Method “generates a contribution requirement that is less than a reasonable actuarially determined contribution.” GRS clearly identifies the shortcomings in the State Mandated Method, but it is unclear on what basis they determine that the contribution requirement generated for FY 2026 is less than a reasonable Actuarially Determined Contribution. Some explanation is warranted, particularly since GRS estimates that the unfunded liability will only increase for two more years before it starts decreasing.

GRS also calculates an “alternative policy contribution” that clearly meets the requirements of a Reasonable Actuarially Determined Contribution. While it is identified as a Reasonable ADC in a footnote of Table 12 in the appendix, it would be helpful to identify it as such in the table in the Executive Summary on page 1.

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Implications of the Funding Policy

In the draft June 30, 2024 Actuarial Valuation Report GRS includes disclosures of the implications of the State Mandated Funding Policy:

1. A qualitative assessment that future contributions are expected to be level as a percentage of capped payroll, and the funded ratio will increase to 90 percent in 2045,
2. An estimate that the dollar amount of the unfunded actuarial liability will increase for two more years before it is expected to decrease, and
3. A statement that the unfunded actuarial liability is never expected to be paid off.

However, the draft June 30, 2024 Actuarial Valuation Report should also include an assessment of whether the funding policy is significantly inconsistent with accumulating assets adequate to make benefit payments and, if applicable, an estimate of the approximate time until assets are depleted.

Calculation and Disclosure of Low Default Risk Obligation Measure (LDROM)

The draft June 30, 2024 Actuarial Valuation includes a description and calculation of LDROM. It includes an explanation of the discount rate curve, cost method, and assumptions used to calculate LDROM. GRS has also included a comparison of the LDROM to the Accrued Liability and commentary explaining the significance of the LDROM as required by ASOP 4 with respect to the funded status of the plan and plan contributions. However, while the basis for the security of participant benefits is mentioned, the significance of LDROM for the security of participant benefits is not discussed.

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Assessment of Actuarial Assumptions Used in the 2024 Valuation

A. Economic Assumptions

The economic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Experience Review Report dated May 23, 2024, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. *The Interest Rate*

The interest rate assumption (also called the investment return or discount rate) is the most impactful assumption affecting the required State contribution amount. This assumption, which is used to value liabilities for funding purposes, was maintained at 6.50% for the draft June 30, 2024 Actuarial Valuation.

After reviewing all the materials (see Appendix B) that were made available, Cheiron concludes that the use of 6.50% for this valuation is reasonable.

We recommend the SURS Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly (Recommendation #3).

Our rationale for these recommendations:

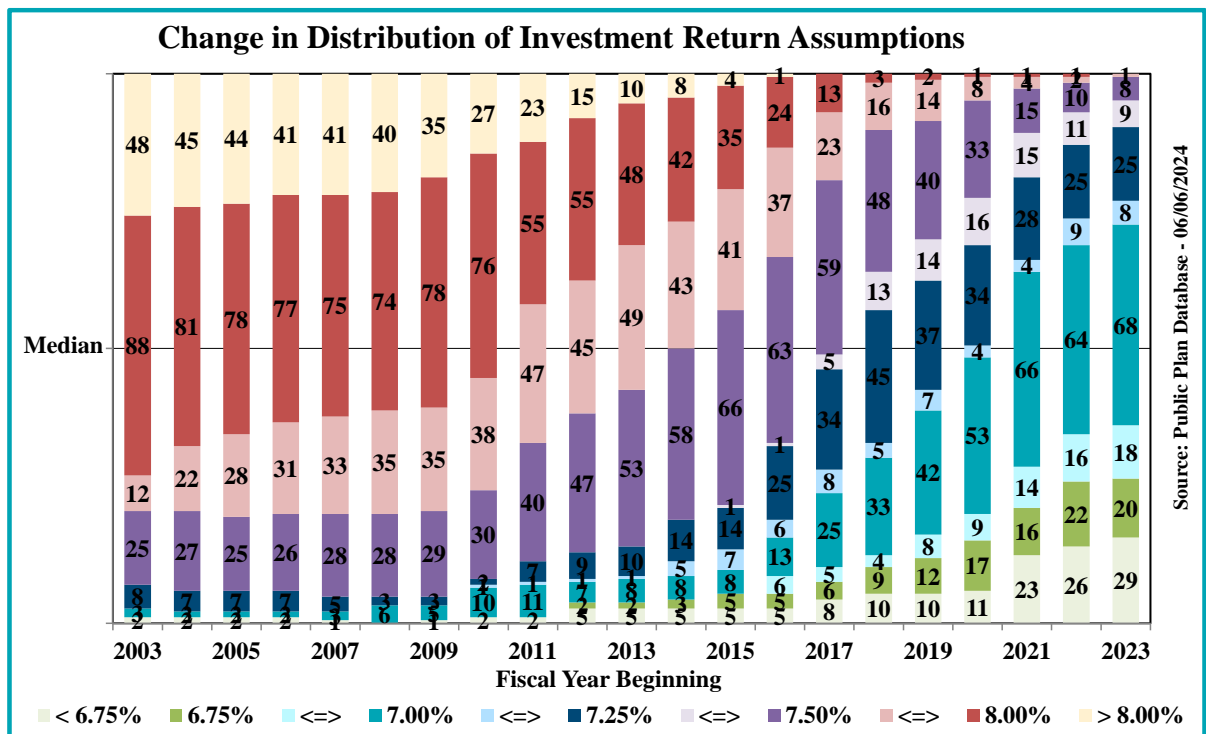
- A review of the interest and inflation rates does not involve the collection of significant data and can be updated annually. In addition, it keeps the Board focused more closely on these critical assumptions.
- GRS's May 2024 Experience Review developed return expectations for SURS' current and long-term target portfolios based on SURS' investment consultant's 2024 capital market assumptions and their 2024 Capital Market Assumption Modeler (CMAM). This modeler uses the forward-looking expectations from 13 independent investment consultants. Based on SURS' investment consultant's 2024 capital market assumptions, the expected 10-year geometric average return is 6.7% using the current portfolio and 6.8% using the long-term target portfolio. Using the 2024 GRS CMAM, the expected 10-year geometric average return is 6.8% using either portfolio, and the probability of meeting or exceeding the 6.50% assumption over a 10-year time horizon is 53% with the current portfolio and 54% with the long-term target portfolio.
- The average expected geometric return using SURS' investment consultant's 20-year capital market assumptions is 7.8% for the current SURS portfolio and 7.9% for the long-term target portfolio. GRS estimated SURS has a 57% chance of meeting or

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exceeding the 6.50% assumption over a 20-year time horizon using the current portfolio and a 58% chance using the long-term target portfolio.

- While the discount rate assumption should be based on the future expected investment returns for the System's investment portfolio, survey information can provide an important context for evaluating the assumption. The Public Plans Database is maintained by a partnership between the Center for State and Local Government Excellence (SLGE) and the Center for Retirement Research at Boston College with support from the National Association of State Retirement Administrators (NASRA). This database contains historical information on large public pension plans, including key assumptions used in their actuarial valuations. The chart on the next page shows the distribution of investment return assumptions for the 186 plans in the Public Plans Database with consistent information from 2003 through 2023 as of June 6, 2024.



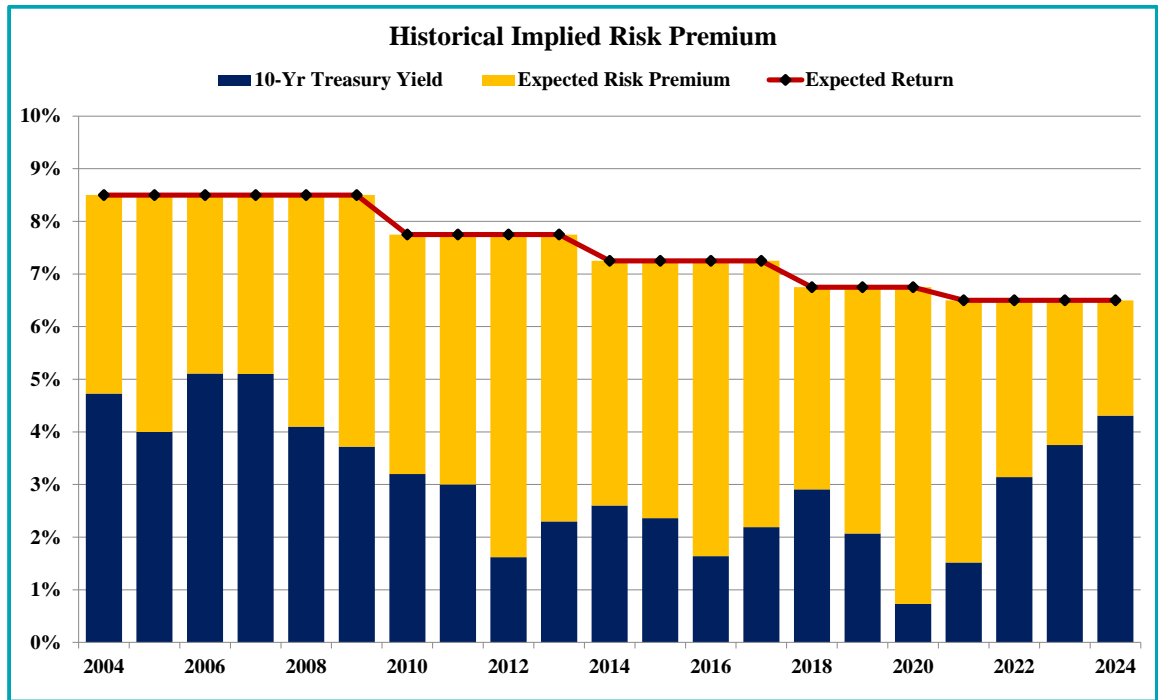
Over the period shown, there continues to be a pattern of reducing discount rates partially reflecting long-term changes in capital markets, interest rates and underlying inflation. Of the 186 plans shown, 128 have reduced their discount rate assumption since 2019. For these plans, the average reduction is 0.39%.

- Over the last two decades, declining interest rates have forced pension plans to either reduce their discount rates, increase their exposure to investment risk, or some combination of the two. For example, as shown in the following chart, in June 2006, the yield on 10-year Treasury bonds (a proxy for a risk-free investments) reached a

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high in the 20-year period of 5.1%. To achieve SURS' then assumed return of 8.50%, the System's investments had to outperform the yield on the 10-year Treasury by 3.4%. In June 2020, the yield on the 10-year Treasury had dropped to 0.7%, and to achieve SURS' assumed return of 7.00%, the System's investments need to exceed the 10-year Treasury yield by 6.3%. Even though SURS had reduced its return assumption by 150 basis points over the period, it still had to take more investment risk in 2020 to meet its assumption than it did in 2002. Since 2020, yields on 10-year Treasury bonds have increased, reducing the expected risk premium needed to achieve the System's assumed return. Yields on 10-year Treasury bonds have been approximately 4% during 2024; therefore, the System's investments currently only need to exceed the 10-year Treasury yield by about 2.50% to achieve the 6.50% assumed return, which is the lowest expected risk premium over the last 20 years. If these higher Treasury bond yields persist, plans may be able to achieve the expected return with less exposure to investment risk. However, if these higher Treasury bond yields prove temporary, plans could quickly find the pressure returning to further reduce discount rates or increase their exposure to investment risk.



2. Inflation Assumption

SURS increased its inflation assumption from 2.25% to 2.40% for the June 30, 2024 valuation.

We find the 2.40% inflation assumption to be reasonable.

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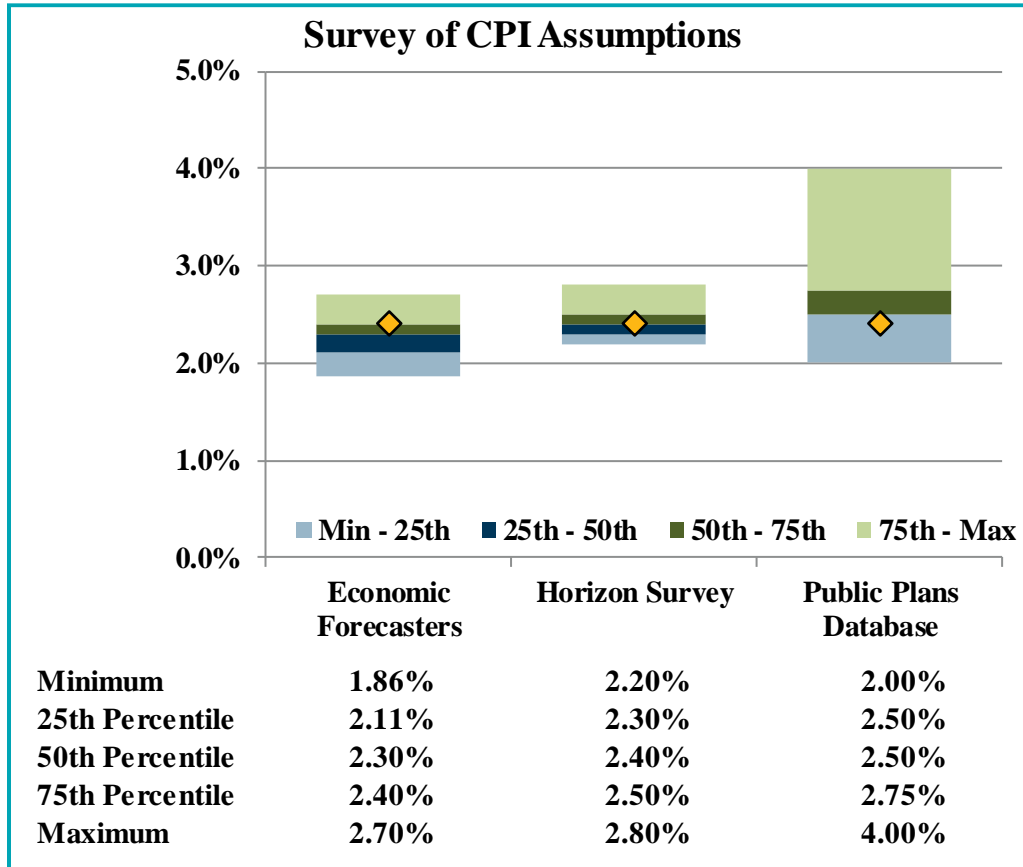
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Our rationale for concurring with the 2.40% assumption:

- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), inflation will average between 1.8% and 3.0% (<http://www.ssa.gov/oact/tr/2023/tr2023.pdf>). Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.4%.
- In the 2024 Experience Review, GRS provides significant data on inflation forecasts including various breakeven inflation rates, average financial firm forecasts, Congressional Budget Office forecasts, a survey conducted by the Philadelphia Federal Reserve, and the inflation expectations model from the Cleveland Federal Reserve. Based on this data, GRS concludes they should increase the assumption to 2.40%.
- The following chart shows the distribution of inflation expectations for the Third Quarter 2024 survey of professional economic forecasters published by the Philadelphia Federal Reserve, the 2024 Horizon survey of investment consultant capital market assumptions (20-year), and the 2023 inflation assumptions used by plans in the Public Plans Database compared to the SURS assumption (indicated by the gold diamonds). The assumption of 2.40% is the 75th percentile of the range projected by professional economic forecasters, the median for investment consultants, and the lower quartile compared to other public pension plans.

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3. *Salary (Annual Compensation) Increase Assumption*

Salary increase assumptions were updated for the 2024 valuation. The real wage growth assumption was maintained at 0.75%, and separate merit/longevity assumptions were established by year of service for academic and non-academic members and members above and below age 50.

The assumed rate of general wage inflation is 3.15%.

Based on the data presented, we find the salary increase assumptions, including a real wage growth assumption of 0.75% and the separate assumptions for academic and non-academic members and members above and below 50 to be reasonable.

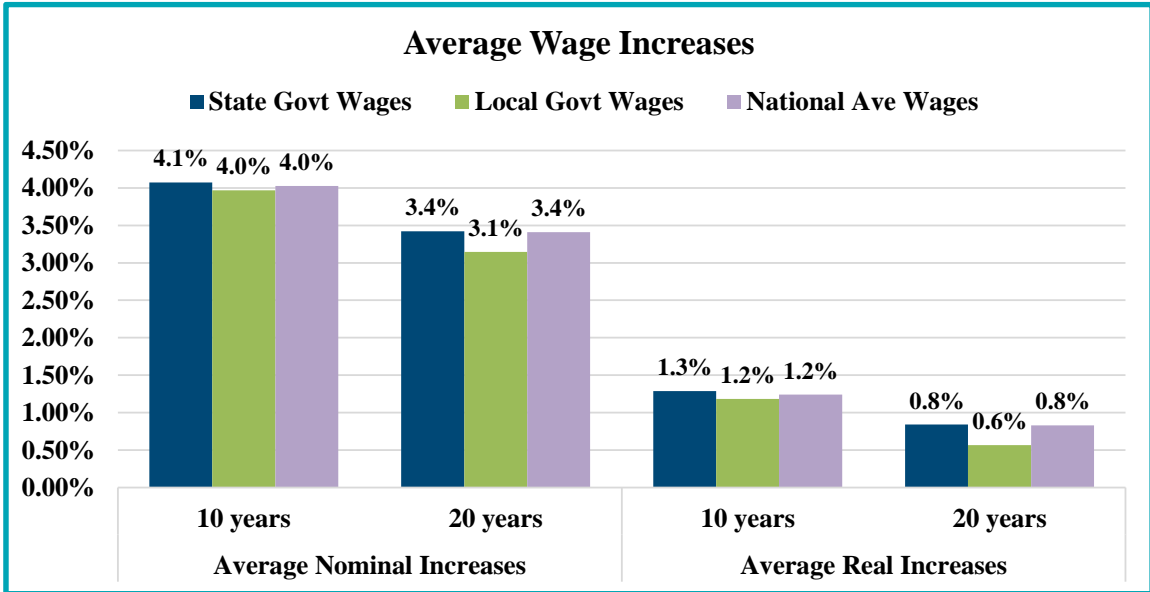
Our rationale for concurring with GRS's recommended salary increase assumption:

- The following chart shows the average nominal and real increases in wages over the last 10 and 20 years for State governments, local governments, and National Average Wages. State and local government data is from the Quarterly Census of Employment

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and Wages as published by the Bureau of Labor Statistics. National Average Wages is published by the Social Security Administration.



- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), real wage differential will average somewhere between 0.53% and 1.74%. Under the intermediate cost projection, the Social Security Administration uses an assumption of 1.14%.
- During the year ending June 30, 2024, there was an experience loss from this assumption (i.e., salary increases were greater than assumed) as shown on page 29 of the draft June 30, 2024 Actuarial Valuation. The table on page 29 shows that there have been losses due to salary increases the last three years. The updated assumptions partially reflect the higher salary increase experience compared to the prior assumptions.

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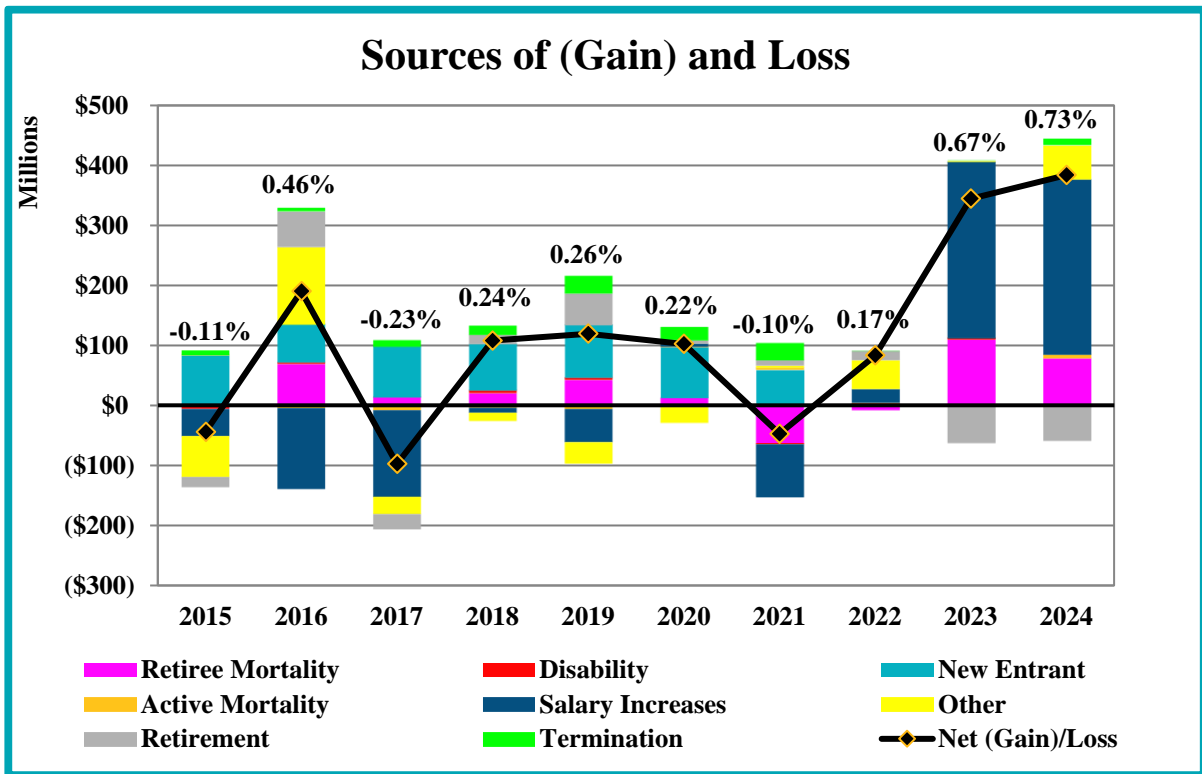
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B. Demographic Assumptions

Demographic assumptions were reviewed as part of an experience study with appropriate assumption changes adopted by the Board in May 2024

In its annual actuarial valuation reports, GRS regularly reports sources of liability gains and losses. In the draft June 30, 2024 Actuarial Valuation, these are shown on page 29. In the chart below, we have collected similar data from GRS's past valuation reports dating back to 2015 and presented a historical review of past demographic and salary increase experience gains and losses.

The chart below shows the pattern of annual gains and losses attributable to eight different sources as shown in the legend. When the colored bar slices appear above zero on the Y-axis, it represents an experience loss with the value representing the increase in liabilities over what was expected. When the bar is below zero, it represents an experience gain for that year with liabilities less than expected. This net liability (gain)/loss is shown by the black line. This net (gain)/loss as a percent of liability is shown above the bars.



The percentages shown above the bars refer to net (gain)/loss as a percentage of liability.

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Key observations from this chart are as follows:

1. In every year prior to 2022, there have been experience losses attributable to new entrants joining SURS. Beginning with the 2022 valuation, GRS reports the new entrant loss in the “other” category. New entrant losses are expected because participants are hired and accrue service between valuations. However, there is also an offsetting asset gain to this loss due to contributions made on behalf of these new entrants.
2. Salary gains had appeared in most years through 2021. However, in 2023 and 2024, there have been significant losses due to higher-than-expected salaries. This assumption was modified with the GRS 2024 Experience Review to reflect higher salary increase rates. While it is possible that the recent salary losses are short-term in nature due to the high inflationary environment, consideration should be given to a select and ultimate salary increase.
3. Termination from employment experience has consistently shown losses, but they have been relatively small. Termination rates are set net of the rate of rehires, but it isn’t clear if the termination experience is reported net of rehires. This assumption was modified in the GRS 2021 Experience Review to produce a lower expected number of terminations. Losses were minor over the following 3-year period. This assumption was re-examined in the GRS 2024 Experience Review and modified to produce fewer expected terminations.
4. Retiree mortality gains and losses are grouped together with unexpected changes in benefit amounts from year to year. GRS notes that unexpected changes may occur when benefits that are initially paid as preliminary estimates are finalized. There were larger than typical losses in 2023 and 2024.
5. Disability and active mortality experience are too small to be noticed on the chart, given their insignificant size relative to other experience items. Since there have been both gains and losses in each of these areas during the period shown, they are not an immediate area of concern.
6. The black line on the graph above shows the net liability (gain)/loss. This net (gain)/loss as a percentage of the liability is shown above the bars. The percentage is generally quite small, and there is no consistent pattern of either gains or losses.

We reviewed the demographic assumptions based on the experience study dated May 23, 2024. We have concluded that all of the demographic assumptions are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4. We have comments on some specific assumptions below but do not believe they would have a material effect. A complete list of actuarial assumptions can be found in Appendix C.

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1. Retirement Rates

The experience study develops normal and early retirement assumptions for each benefit tier by age separately for Academic, Non-Academic, and Police members. The analysis is liability-weighted, which effectively takes into account service and salary in addition to age. In our experience, retirement rates typically vary primarily by age and service, so the liability-weighted analysis should produce assumptions that accurately predict the portion of liability that retires in the next year.

However, because the same retirement rate is applied to all members of the same age, regardless of service, the projection of future benefit accruals and the present value of benefits may not be accurate. For example, at age 60, 12% of Tier 1 Academic members are assumed to retire whether they have 8 years of service or 36 years of service. At 8 years of service, an additional year of service would increase the member's benefit by 12.5% even before accounting for any salary increase. Consequently, there is a significant incentive to continue working. At 36 years of service, the member would reach the maximum benefit as a percentage of pay within the next year, significantly reducing the incentive to continue working and making them highly likely to retire. Projecting both members at the same retirement rate likely understates the probability of the 36 years of service member retires and overstates the probability of the 8 years of service member retires. This would assume the longer service members stay active longer than experience suggests which results in more members earning less valuable benefits (i.e., normal costs) due to being above the maximum benefit as a percentage of pay while assuming low service members retire sooner than experience suggests which results in fewer members earning more valuable benefit accruals (i.e., normal costs). The System's State contributions are based on the projected 2045 liability, and using liability-weighted retirement rates based only on age may understate the projected 2045 liability.

We suggest that in the next experience study, the retirement rate analysis be performed separately by age and service. Years of service can be grouped together to ensure there is sufficient experience in each group to set an assumption. There is insufficient information in the experience study to determine if this approach would have a material impact on the valuation results.

2. Termination Rates

The experience study develops net termination rates by service separately for Academic and Non-Academic members. Net termination rates are termination rates offset by the rate of rehire at each year of service. The analysis is liability-weighted, which effectively takes into account age and salary in addition to service.

While there are some discontinuities in calculating a net termination rate because the rehired employees are often older than the terminating employees at any given service band, this methodology should produce more conservative termination rates. While the

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liability-weighted approach has some of the same issues described above for retirement rates, the materiality of the differences for termination rates often doesn't justify setting termination rates by both service and age. Consequently, we believe the analysis and the assumed termination rates are reasonable.

3. Plan Election Percentage

Upon hire, members can elect to participate in a defined benefit plan (the Traditional or Portable Plan) or a defined contribution plan (the Retirement Savings Plan). The analysis shows that the members who elect the RSP have a higher average salary than those who elect the defined benefit plan. Consequently, the analysis is weighted by salary, and separate assumptions are developed for Academic and Non-Academic members.

We understand that this assumption is applied to the new entrant profile to project the future population of the defined benefit plan. Since the new entrant profile is set by age at hire and sex, we suggest that the plan election percentage in the next experience study should also be studied by age at hire and sex. Furthermore, while the numbers may be much smaller, we believe it is likely that Police members have different election percentages than other Non-Academic members and should be studied separately.

4. Buyout Election Assumption

GRS studied buyout option elections for the two options available in the Plan:

- i) The vested inactive member buyout (VIB), which provides vested inactive members a payment equal to 60% of the present value of their pension benefit in lieu of any future payments and
- ii) The automatic annual increase buyout, which provides Tier 1 members a payment equal to 70% of the difference between the present value of their current AAI provisions and the revised provision available to Tier 2 members

Their analysis showed that very few members had been approved for buyouts through 6/30/2024. We find the assumption of no future buyouts and the basis for setting it as reasonable.

5. Assumptions with No Analysis

The following assumptions do not appear to have been analyzed in the experience review. We suggest that future experience reviews provide an analysis of these assumptions.

- Police member percentage of duty disabilities
- Marital status
- Spouse age
- Form of Payment

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C. Funding Methods

Actuarial funding methods consist of three components: (1) the actuarial cost method, which is the attribution of total costs to past, current, and future years; (2) the asset valuation method (i.e., asset smoothing); and (3) the amortization method.

1. Actuarial Cost Method

The System uses the Projected Unit Credit cost method (PUC) to assign costs to years of service, as required under the Pension Code (40 ILCS 5/15). **We have no objections with respect to using the PUC method, although we would prefer the Entry Age Normal (EAN) cost method as it is more consistent with the requirement in 40 ILCS 5/15 -155 requirement for level percentage of pay funding.**

Under the PUC method, which is used by some public sector pension funds, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the valuation date but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the actuarial liability for a given active participant. Under the PUC cost method, the value of an active participant's benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. While the PUC method is not an unreasonable method, as a result of this pattern of benefit values increasing, more plans use the EAN cost method to mitigate this effect. It should also be noted that the EAN cost method is the required method to calculate liability for GASB Nos 67 and 68.

2. Asset Valuation Method

The Actuarial Value of Assets for the System is a smoothed market value. Unanticipated changes in market value are recognized over five years in the Actuarial Value of Assets. The primary purpose for smoothing out gains and losses over multiple years is so fluctuations in the contributions will be less volatile over time than if based on the Market Value of Assets.

The 2024 Public Retirement Systems Study by the National Conference on Public Employee Retirement Systems (NCPERS) survey of 157 public retirement funds found that the majority of plans responding to the survey have a five-year smoothing period.

Smoothing the market gains and losses over a period of five years to determine the Actuarial Value of Assets is a generally accepted approach in determining actuarial cost, and we concur with its use.

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3. *Amortization Method*

The mandated State contribution is based on a determination of the level percentage of payroll that is expected to achieve a 90% funded ratio in 2045. While not a traditional amortization method, this methodology effectively amortizes a portion of the Unfunded Actuarial Liability over the remaining period until 2045, which is currently 21 years.

One of the principles of funding public plans identified by the American Academy of Actuaries is that there should be “a plan to make up for any variations in actual assets from the funding target within a defined and reasonable time period.” Because it only targets 90%, the State method does not include a plan to achieve the funding target over any period of time.

Typical public plan amortization methods are designed to increase each year by expected payroll growth. Under the State mandated method, however, the effective amortization payment increases each year by more than the expected growth in payroll. As a result, the State mandated method defers payments on the Unfunded Actuarial Liability further into the future than under typical public plan amortization methods.

Finally, as the remaining period to achieve 90% funding shortens, the State mandated method will also produce more volatile contributions. Instead of a single fixed period, typical public plan amortization methods use layered amortization bases such that new assumption changes and experience gains and losses are amortized over a new period (e.g., 20 years) while the remaining period for the prior amortization layers becomes one year shorter.

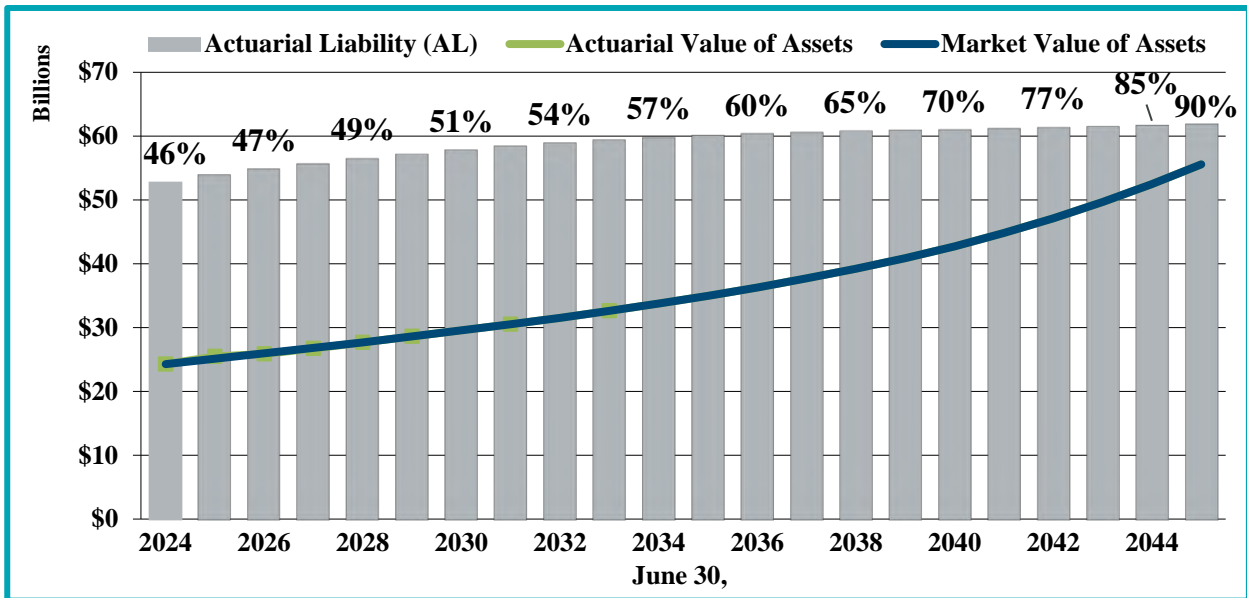
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SECTION IV– PROJECTION ANALYSIS

This section reviews the projections contained in the draft June 30, 2024 Actuarial Valuation of SURS. These projections are fundamental to the development of the required State contribution calculated under the current statutory funding requirement.

The following graphs are independent approximations of the projections performed by the State actuary to verify that the System’s funding projections are reasonable. They do not reflect all the precision of the projections applied by the System’s actuary, but instead, they are intended to verify the reasonableness of the modeling done by the System’s actuary.

The graph below shows our projection of the expected future liabilities and assets in the System through 2045. As pointed out on page 9 of the draft June 30, 2024 Actuarial Valuation, the majority of the funding of the System occurs in the later years of the projections. The **lines show the projected assets** (market value and actuarial value), and the **bars show the projected liabilities** of the System. The funded ratio for every other year is shown at the top of the bars. For example, in 2034, the funded ratio is projected to be approximately 57%, with assets being approximately \$34 billion and liabilities being approximately \$60 billion.

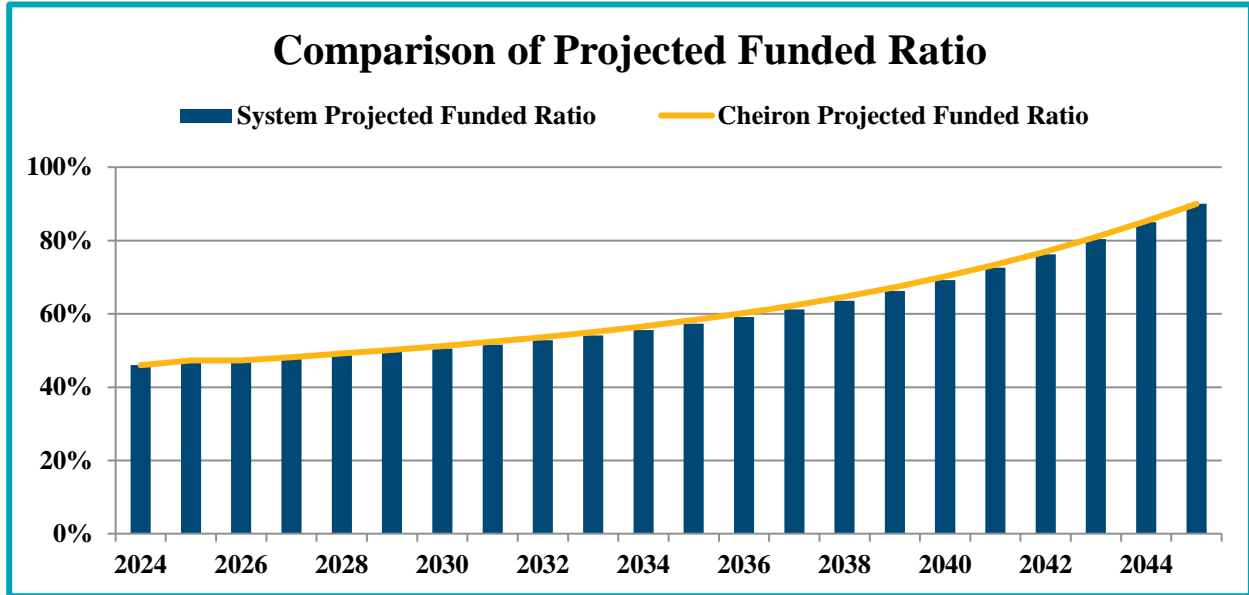


Source: Cheiron projection analysis.

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When we compare, in the chart below, our projected funded ratio (yellow line) against the results shown in the draft June 30, 2024 Actuarial Valuation (blue bars), we find a very close match in expected funded ratio. This close match of the funded ratio indicates that the projections done by the System's actuary are reasonable.

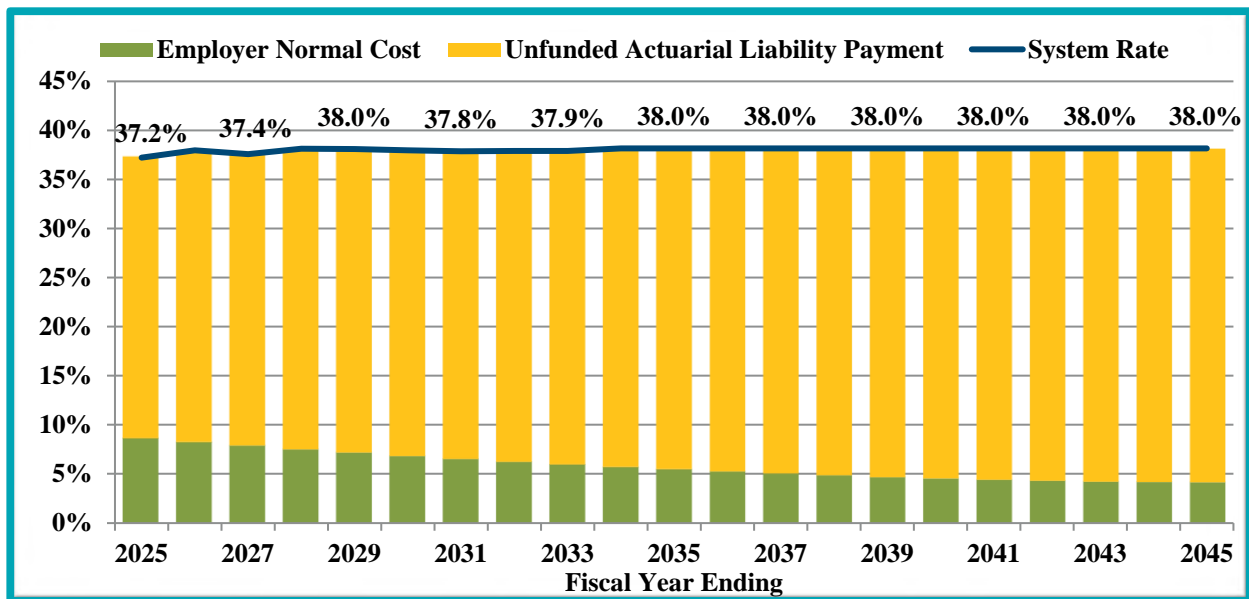


Source: Cheiron projection analysis.

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The following graph shows the expected contributions calculated under the statutory method. The contribution as a percentage of payroll is shown above each bar. The value shown for the fiscal year ending 2025 was set based on the June 30, 2023 Actuarial Valuation. The current valuation is the basis for setting the rates starting July 1, 2025 (Fiscal Year Ending June 30, 2026). The contribution requirement has two components: 1) the employer normal cost, which is the approximate value of the amount of benefits accrued by participants not covered by employee contributions based on the statutory funding method; and 2) an amortization of the Unfunded Liability. The normal cost amounts are shown by the green bars and the amortization of the Unfunded Actuarial Liability (UAL) amounts by the yellow bars. The percentages shown are the total contribution rates calculated by Cheiron which are equal to the sum of the bars. The graph shows that a larger percentage of the total contribution is being made toward the UAL payment later in the period. The blue line shows the projected contribution rates as a percentage of payroll from the draft June 30, 2024 Actuarial Valuation. The difference between Cheiron’s approximation and the System’s projections is the difference between the top of the bars and the line.



Source: Cheiron projection analysis.

Our conclusion is that **the projections performed by the System’s actuary are reasonable.**

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SECTION V– ANALYSIS OF FUNDING ADEQUACY

In this section, we examine the adequacy of the funding for the System, including funded ratio, the sources of changes in the Unfunded Actuarial Liability (UAL), and projections of the UAL and statutory funding requirements compared to contributions needed to pay down the UAL.

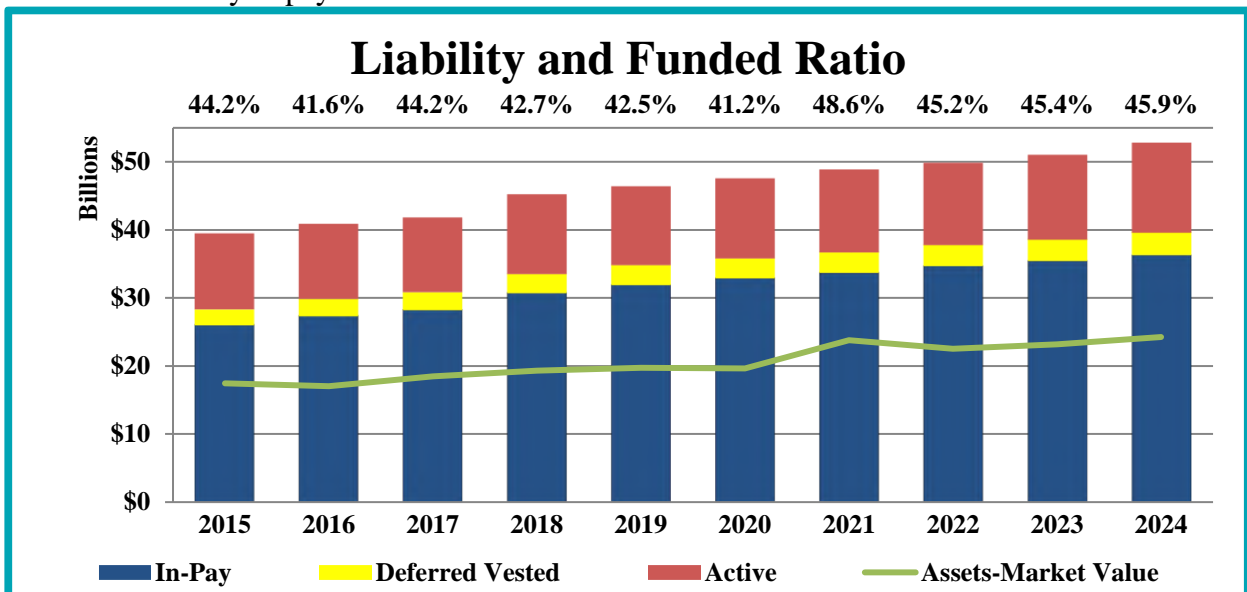
The actuarial valuation report prepared by GRS includes both traditional actuarial measurements, as well as additional risk measurements that are shown on pages 15, 16, and 17 in their 2024 valuation report. GRS also identified and assessed risk measurements in Section J of their final 2023 Actuarial Valuation Report. Given the unique and substantial funding challenges faced by the Illinois pension systems, this section on funding adequacy supplements the information from the GRS report to better inform the legislature and other stakeholders about the adequacy of the System’s funding.

System Funded Ratio

The first funding adequacy measure is the historical trend of the funded ratio for the past 10 years. Funded ratio for this purpose is defined as the ratio of the Market Value of Assets to the actuarial liability. The chart below shows SURS’ funded ratio since 2015 has gone from 44.2% funded to 45.9% funded in 2024, an increase of 1.7%. In addition to showing the funded ratio, this chart also shows the breakdown of the plan’s liabilities by membership status:

- Active liability – the liability (attributable to service already performed) for future payments to members who are currently working in the System,
- Deferred Vested liability – the liability for future payments to members who are no longer working in the system, and
- In-Pay liability – the liability for future payments to retirees and beneficiaries who are currently receiving benefits.

This breakdown shows that plan assets today only cover about 67% of the liabilities for just those members currently in pay status.



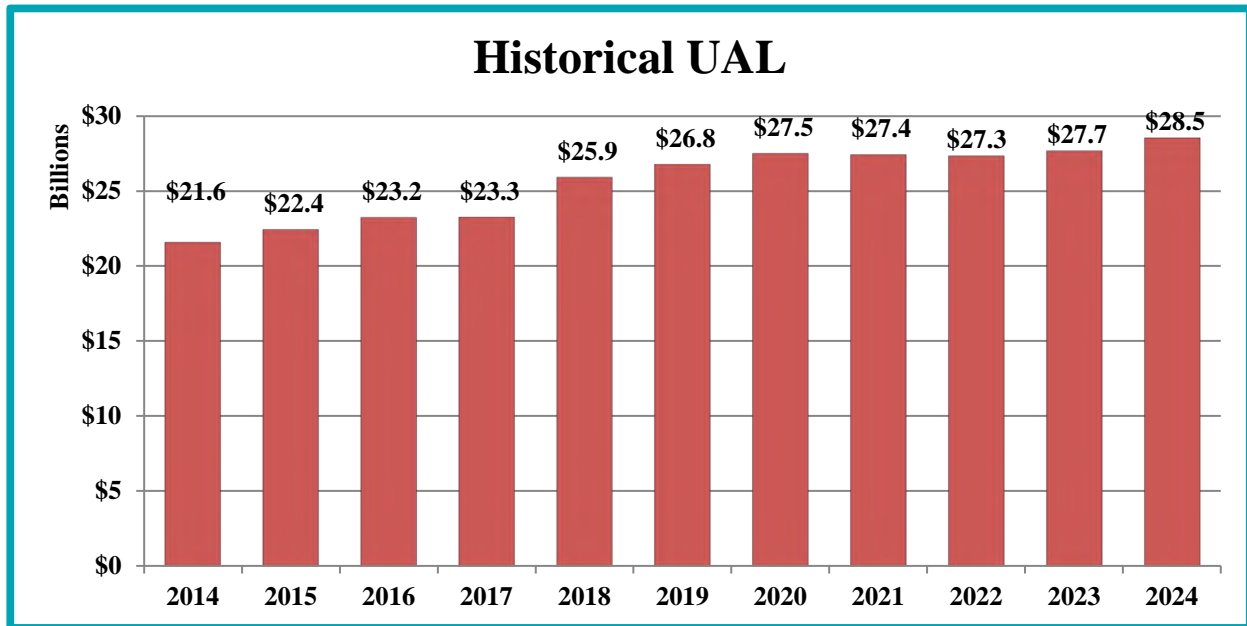
Source: Cheiron analysis of funding adequacy.

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SECTION V– ANALYSIS OF FUNDING ADEQUACY

Sources of Changes in the UAL

As shown in the chart below, SURS' Unfunded Actuarial Liability (UAL) has grown from about \$21.6 billion in 2014 to \$28.5 billion in 2024, an increase of \$6.9 billion. To understand how to reverse this trend, it is important to understand the sources contributing to it.



Source: Cheiron analysis of funding adequacy.

The changes to the UAL from June 30, 2014 to June 30, 2024 can be separated into the following components:

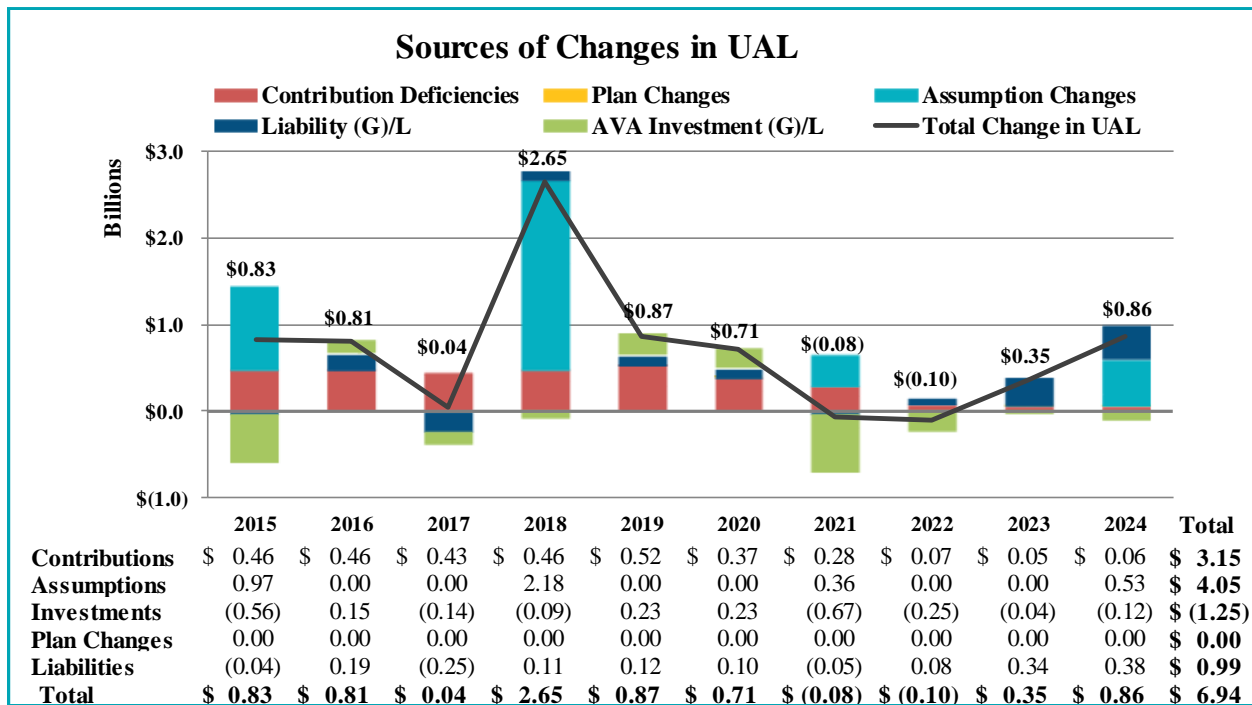
- **Contribution Deficiencies** – Contributions that are less than the tread water contribution causes the UAL to increase. The tread water contribution consists of two components: the normal cost, which is the cost of benefits earned in a given year, and the interest on the Unfunded Actuarial Liability. This sum is referred to as the tread water contribution because it is the contribution necessary so that the UAL will remain constant, or “tread water” (absent experience gains or losses). The difference between actual contributions and the tread water contributions have increased the UAL by \$3.15 billion over this period.
- **Assumption Changes** are changes to actuarial assumptions as the System updated expectations on future investment returns and life expectancy. A positive aspect of the UAL increases due to assumption changes is that they will result in liability measurements that more accurately reflect future expectations. Over this period, assumption changes have increased the UAL by \$4.05 billion.

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- **Plan Changes** are any modifications to the Plan's design that have affected benefits already accrued. Since most of the changes to the Plan only affect future benefits, the impact has been negligible during this period.
- **Liability (Gain) or Loss** are the changes in the UAL due to liability experience (i.e., mortality, terminations, salary increases, etc.). These had a net effect of increasing the UAL by \$0.99 billion during this period.
- **AVA (Actuarial Value of Assets) Investment (Gain) or Loss** is the net investment gain or loss due to assets earning more or less than assumed. These have decreased the UAL over this period by \$1.25 billion.

The chart below shows the changes in UAL each year broken into these five components. The sum of all the components (total change in UAL) is shown as the black line.



Source: Cheiron analysis of funding adequacy.

We expect that this chart will help stakeholders understand the sources of growth in the UAL over the past decade and inform discussions about the current funding requirements and adequacy.

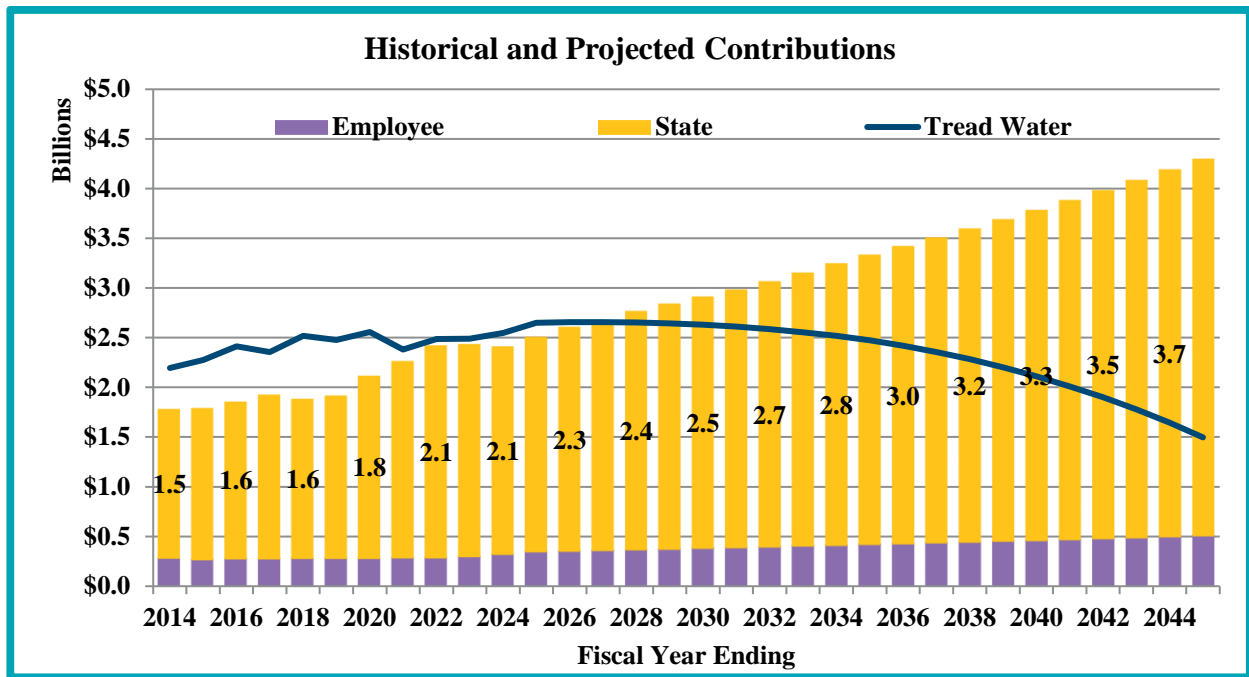
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SECTION V– ANALYSIS OF FUNDING ADEQUACY

Actual Contributions Compared to Tread Water Contribution

One persistent source of the increase in UAL is due to actual contributions to the System being less than the tread water contribution (the amount needed to prevent the UAL from increasing if all assumptions are met). These contribution deficiencies have added between \$50 to \$520 million to the UAL each year over the historical period shown.

The chart below shows that actual contributions (purple and gold bars) have been significantly less than the tread water cost (blue line). Each year that total contributions remain below the tread water cost, the UAL is expected to grow. As shown in the graph below the total contributions are expected to reach the tread water contribution in FY 2026 and begin to pay down the UAL based on the Market Value of Assets.



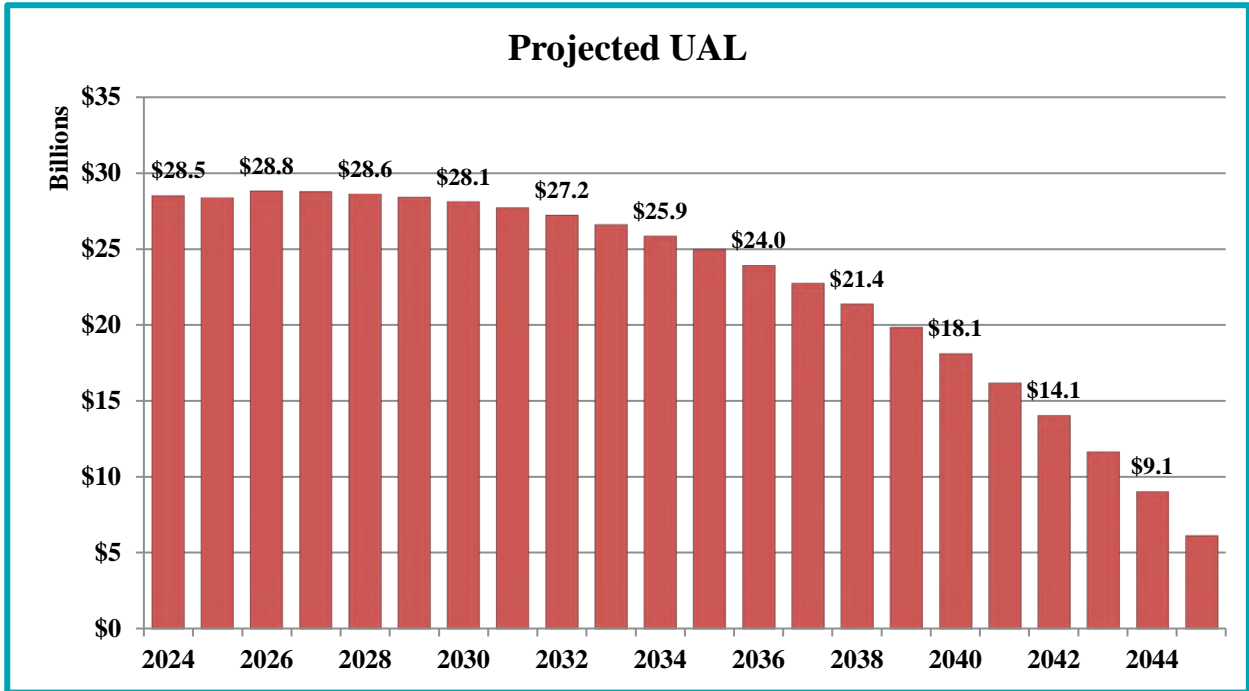
Source: Cheiron analysis of funding adequacy.

The System’s actuary commented that “the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution.” It isn’t clear what standard the System’s actuary is using to make this determination. With the recent revision to ASOP 4, the actuary needs to consider if the contribution generated by the statutory funding method is less than employer normal cost and expenses plus an amortization payment on the UAL that meets the requirements of Section 3.14 of ASOP 4.

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The next chart shows that if the Minimum Required Contributions continue to be made each year and all other assumptions are met, the UAL based on the Actuarial Value of Assets is projected to decline from \$28.5 billion in 2024 to \$6.1 billion in 2045. The slight growth over the next few years is due to a combination of contributions and recognition of offsetting investment gains and losses in the asset smoothing method.



Source: Cheiron analysis of funding adequacy

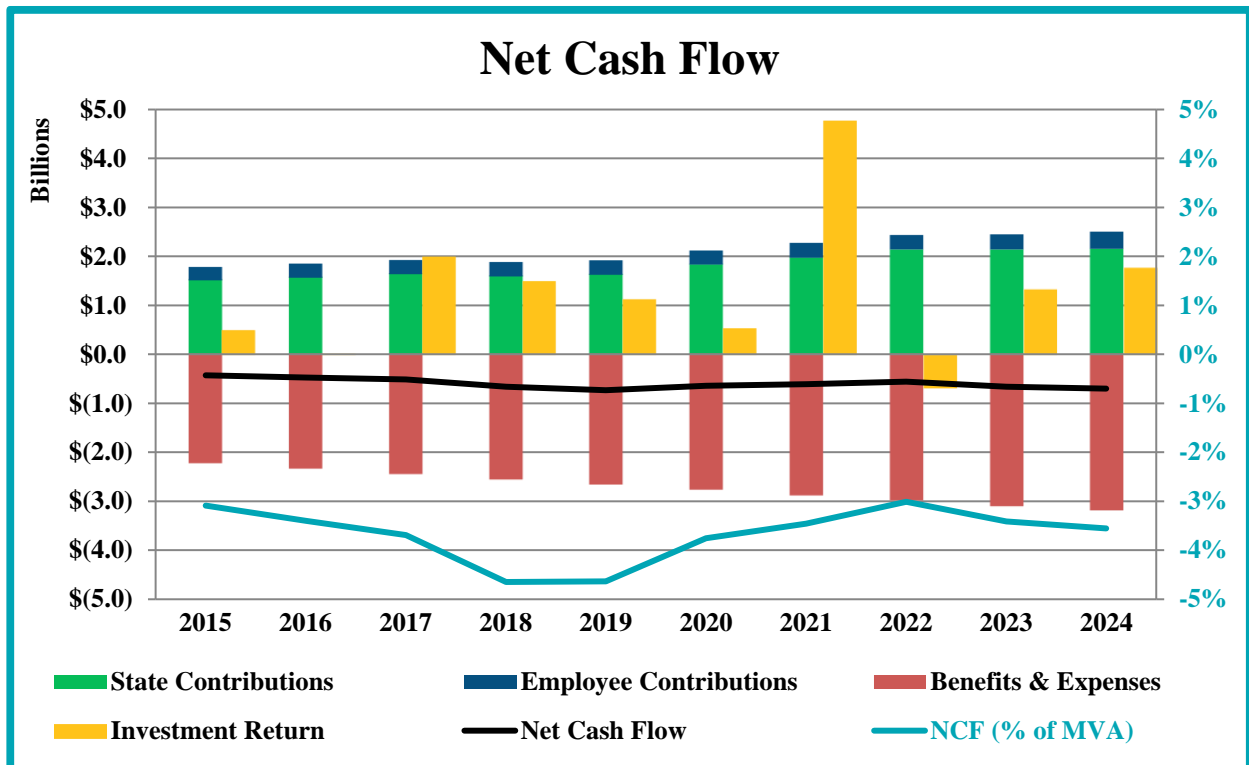
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SECTION V– ANALYSIS OF FUNDING ADEQUACY

Net Cash Flow Analysis

The Plan’s net cash flow is defined as State and member contributions less benefit payments and administrative expenses. The more negative net cash flow is as a percentage of the plan’s assets, the more vulnerable the Plan is to market downturns. When a pension plan has more payouts than contributions and suffers an investment loss, it is left with fewer assets to invest and recapture during a recovery.

Looking at the chart below, SURS has slightly negative net cash flow (black line). If contributions increase as quickly as benefit payments, the net cash flow will remain stable. But if contributions do not continue to grow either because the Plan has become better funded or because the expected contributions are not made, negative net cash flow may become a more significant issue, therefore it should continue to be monitored. The teal line shows net cash flow as a percent of Market Value of Assets on the right-side axis. The greater the negative cash flows are relative to plan assets the more vulnerable a plan is to market downturns. This is because once there is a market downturn, the plan assets lose both on the return and the negative cash flow, leaving it with a lower asset base from which to recover from the loss.



Source: Cheiron analysis of funding adequacy.

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STATUS OF RECOMMENDATIONS FROM 2023 STATE ACTUARY’S REPORT

Response to Recommendations in 2023

In the State Actuary’s Preliminary Report on the State Universities Retirement System of Illinois dated December 18, 2023, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in either the System’s comments last year or in this year’s June 30, 2024 Actuarial Valuation.

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.	Not Implemented	The System has adopted a funding policy that would meet the recommendation; however, the actual funding of the System is based on State statute and a change in the funding method and funding policy would require a statutory change. Recommendation repeated.
2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.	Not Implemented	This period is determined by Public Act 100-0023 and would require a statutory change. Recommendation repeated.
3. Section 3.2 of ASOP 51 requires the actuary to identify risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” [emphasis added]. The risks currently identified appear to largely duplicate the list of examples in ASOP 51 and could apply to almost any pension plan. In future valuations, we recommend that the actuary explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition.	Implemented	GRS revised the list of identified risks to include only those that may reasonably be anticipated to significantly affect SURS’ future financial condition. Recommendation removed.

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STATUS OF RECOMMENDATIONS FROM 2023 STATE ACTUARY’S REPORT

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
<p>4. For each risk identified above, Section 3.3 of ASOP 51 requires the actuary to provide an assessment that takes into account “circumstances specific to the plan.” For some of the identified risks, the actuary has provided a quantitative assessment specific to the plan while for other identified risks, the actuary has only provided a generic statement that could apply to any plan. We recommend that for each identified risk the actuary provide an assessment, preferably quantitative, that considers the specific circumstances of this plan.</p>	Implemented	<p>With the revised list of key risks from recommendation #3, GRS now provides a quantitative assessment of each identified risk that considers the specific circumstances of SURS.</p> <p>Recommendation removed.</p>
<p>5. We recommend the SURS Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.</p>	Implemented	<p>We will continue to include the recommendation to review economic assumptions each year.</p> <p>Recommendation continued.</p>

Chapter Three

Preliminary Report on the State Employees' Retirement System

In accordance with 30 ILCS 5/2-8.1, Cheiron, the State Actuary, submitted a preliminary report to the Board of Trustees of the State Employees' Retirement

System (SERS) concerning proposed certifications of required State contributions submitted to Cheiron by the Board. The preliminary report was submitted to SERS on November 26, 2024. The preliminary report was based on Cheiron's review of actuarial assumptions included in SERS' 2024 Actuarial Valuation Report.

Following is Cheiron's final preliminary report on the State Employees' Retirement System. SERS' written response, provided on December 10, 2024, can be found in Appendix D.

OVERVIEW	
STATE EMPLOYEES' RETIREMENT SYSTEM	
as of June 30, 2024	
Actuarial accrued liability	\$55,696,890,736
Actuarial value of assets	\$25,528,760,746
Unfunded liability	\$30,168,129,990
Funded ratio	45.8%
Employer normal cost	\$597,555,989
State contribution (FY26)	\$2,597,558,000
Active members	65,508
Inactive members	35,411
Current benefit recipients	78,797
Eligible for deferred benefits	153
Total membership	179,869
Interest rate assumption	6.75%
Inflation assumption	2.25%
Actuarial cost method	Projected Unit Credit
Asset valuation method	5-year Smoothing
Executive Director	Tim Blair
Actuarial Firm	Gabriel, Roeder, Smith & Company
Source: June 30, 2024 SERS actuarial valuation report.	

December 17, 2024

Mr. Frank Mautino
Auditor General
400 W. Monroe Street
Springfield, Illinois 62704

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

Dear Trustees and Auditor General:

In accordance with the Illinois State Auditing Act (30 ILCS 5/2-8.1), Cheiron is submitting this preliminary report concerning the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contribution to the State Employees' Retirement System of Illinois (SERS or System) for Fiscal Year 2026.

In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law. We note that the history of inadequate funding has resulted in current and future contribution levels, measured as a percentage of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings and recommendations. Section III provides the supporting analysis for those findings and presents more details on our assessment of the actuarial assumptions and methods employed in GRS's Actuarial Certification, as well as our assessment of GRS's determination of the required State contribution for Fiscal Year 2026. Section III also includes comments on other issues impacting the funding of SERS, including the implications of Article 14 of the Illinois Pension Code, which establishes the statutory minimum funding requirements for the System. Section IV reviews the projections contained in the draft June 30, 2024 Actuarial Valuation. Finally, Section V provides an analysis of funding adequacy.

In preparing this report, we relied on information (some oral and some written) supplied by SERS and GRS. This information includes actuarial assumptions and methods adopted by the SERS Board, System provisions, the draft June 30, 2024 Actuarial Valuation, the draft 2024 GASB 67/68 Report, the 2021 Actuarial Experience Study, the 2024 Economic Assumption Update Review, the actuarial audit of the June 30, 2020 Actuarial Valuation, and minutes of the 2024 plan year SERS Board of Trustee meetings. A detailed description of all information provided for this review is contained in Appendix B.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Office of the Auditor General and the State Employees' Retirement System of Illinois for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron

SIGNED ORIGINAL ON FILE

Heath Merlak, FSA, EA, FCA, MAAA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Michael J. Noble, FSA, EA, FCA, MAAA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Matthew Wells, FSA, EA, MAAA
Associate Actuary

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SECTION I – REPORT SCOPE

Illinois Public Act 097-0694 (the Act) amended the Illinois State Auditing Act (30 ILCS 5/2-8.1) and requires Cheiron, as the State Actuary, to review the actuarial assumptions and valuation of the State Employees’ Retirement System of Illinois (SERS or System) and to issue to the SERS Board this preliminary report on the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contributions for Fiscal Year (FY) 2026. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the SERS Board to consider before finalizing its certification of the required State contributions for FY 2026.

While the Act states that just the actuarial assumptions and valuation are to be reviewed, we have also reviewed the actuarial methodologies (funding and asset smoothing methods) employed in preparing the Actuarial Certification, as these methods can have a material effect on the amount of the State contribution being certified. Finally, we have offered our opinion on the implications of Article 14-131 of the Illinois Pension Code, which impacts the contribution amount certified by GRS.

In conducting this review, Cheiron reviewed the draft June 30, 2024 Actuarial Valuation, the draft 2024 GASB 67/68 Report, the 2024 Actuarial Results presentation, the 2021 Actuarial Experience Study, the 2024 Economic Assumption Update Review, the actuarial audit of the June 30, 2020 Actuarial Valuation, and minutes of the plan year 2024 SERS Board of Trustee meetings. The materials we reviewed are listed in Appendix B.

In addition to reviewing the Actuarial Certification of the required State contribution to SERS, the Act requires the State Actuary to conduct a review of the “actuarial practices” of the Board. While the term “actuarial practices” was not defined in the Act, we continue to interpret this language to mean that we review: (1) the use of a qualified actuary (as defined by the Qualification Standards of the American Academy of Actuaries) to prepare the annual actuarial valuation for determining the required State contribution; and (2) the conduct of periodic formal experience studies to justify the assumptions used in the actuarial valuation. In addition, we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2024 Actuarial Valuation.

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SECTION II – SUMMARY OF RECOMMENDATIONS

This section summarizes recommendations from our review of the actuarial assumptions and methods employed in the draft June 30, 2024 Actuarial Valuation of SERS, as well as the “actuarial practices” of the SERS Board. Section III of this report contains detailed analysis and rationale for these recommendations.

Proposed Certification of the Required State Contribution

Gabriel, Roeder, Smith & Company (GRS) has determined that the FY 2026 required State contribution calculated under the current statutory funding requirements is \$2,597,558,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and have reviewed the assumptions on which it was based. We have accepted GRS’s 2024 Actuarial Liability as well as the annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions.

State Mandated Funding Method

1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State’s funding policy to require that the contribution impact of all assumption changes be phased-in over a five-year period.

2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing this phase-in period is under the jurisdiction of State law and not the Retirement System.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

30 ILCS 5/2-8.1 requires the State Actuary to identify recommended changes in actuarial assumptions that the SERS Board must consider before finalizing its certification of the required State contribution. We have reviewed all the actuarial assumptions used in the draft June 30, 2024 Actuarial Valuation and conclude that the assumptions are reasonable in general, based on the evidence provided to us.

Recommended Changes for Future Valuations

3. We recommend the SERS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.

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SECTION II – SUMMARY OF RECOMMENDATIONS

4. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

GASB 67 and 68

The 2024 SERS GASB Nos. 67 and 68 information was provided in a separate report. We find that the assumptions and methods used to prepare the 2024 SERS GASB Nos. 67 and 68 schedules are reasonable based on the materials provided to us.

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SECTION III – SUPPORTING ANALYSIS

In this section, we provide detailed analysis and supporting rationale for the recommendations that were presented in Section II of this report.

Proposed Certification of the Required State Contribution

As stated in our summary of recommendations in Section II, we have verified the arithmetic calculations made by GRS to develop the required State contribution, reviewed the assumptions on which it is based, and accepted GRS's 2024 Actuarial Liability as well as the annual projections of future payroll, total normal costs, benefits, expenses, and total contributions. However, in accordance with 30 ILCS 5/2-8.1, our review does not include a replication of the actuarial valuation results.

State Mandated Methods

The Illinois Pension Code (40 ILCS 5/2-124) establishes a method that does not fully fund the System. This law requires the actuary to calculate the employer contribution as the level percentage of projected payroll that would accumulate assets equal to 90% of the Actuarial Accrued Liability in the year 2045 if all assumptions are met. This contribution methodology does not conform to generally accepted actuarial principles and practices. Generally accepted actuarial funding methods target the accumulation of assets equal to 100% of the Actuarial Accrued Liability, not 90%.

We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period (Recommendation #1).

The State Mandated Method will soon enter a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the plan is ultimately 100% funded within a reasonable period.

The State Mandated Contribution for FY 2026 is sufficient to pay the employer normal cost, administrative expenses, and an amortization payment on the UAL that would be expected to pay off the UAL in 25.0 years. According to "Actuarial Funding Policies and Practices for Public Plans" published by the Conference of Consulting Actuaries, an amortization period greater than 25 years but not greater than 30 years is considered a reasonable transition policy but is a "Non-Recommended Practice" on an ongoing basis. The declining normal cost combined with the State Mandated Method will produce shorter amortization periods and a reasonable contribution amount in the future. Consequently, the current contribution amount may be considered reasonable even though the methodology is not reasonable because it does not accumulate assets equal to 100% of the Actuarial Accrued Liability.

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SECTION III – SUPPORTING ANALYSIS

The State Mandated Method will produce increasingly volatile contribution levels as the remaining period to achieve 90% funding shortens. Consequently, when changing to a reasonable ADC, as described above, consideration should be given to a method, such as layered amortization, that produces more stable contribution requirements.

The GRS June 30, 2024 Actuarial Valuation includes a recommended funding policy which would contribute the normal cost plus an amortization payment that would seek to fully pay off the total Unfunded Actuarial Liability over a closed period by the year 2045. In the same report on pages 11 through 15, GRS also demonstrates the implications of the statutory funding amounts on the growth of the Unfunded Actuarial Liability. The SERS Board of Trustees has agreed with this recommendation and adopted a separate funding policy to calculate an *Actuarially Determined Contribution (ADC)*. The funding policy calls for a funding amount equal to the normal cost plus a closed 25-year amortization as a level percentage of uncapped payroll of the Unfunded Actuarial Liability. As of June 30, 2024, the remaining amortization period is 16 years. This policy defines a method that would ultimately fully fund the Plan and falls within generally accepted actuarial funding methods currently in use for public plans. According to this methodology, the State's contribution amount would be \$3,293,438,275 for FY 2026 compared to the statutory contribution amount of \$2,597,558,000. It is important though to recognize that the ADC does not affect the actual funding of the System.

We have reviewed the adopted funding policy. We note that this policy meets the requirements of a Reasonable Actuarially Determined Contribution and satisfies the ASOP 4 requirement to calculate and disclose a Reasonable Actuarially Determined Contribution (ADC). We also agree with its use in the GASB report as an ADC. Finally, while this method is an improvement to the State Mandated Funding Method, it would produce increasingly unstable contributions as 2040 approaches due to the method being a closed period amortization.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State's funding policy to require that the contribution impact of all assumption changes, including changes prior to P.A. 100-0023, be phased-in over a five-year period. As such, the Act delays the recognition of the impact of assumption changes when calculating the contribution requirement of the System. Assumption changes are intended to more accurately anticipate the obligations for funding based on the most recent experience analysis and forward-looking changes to future investment returns. However, only one-fifth of the impact of these changes are now recognized from the date of adoption. The remainder of the impact is recognized over four additional years such that the full impact is only recognized at the end of a five-year period beginning at the date of adoption. This phase-in provides time to adjust to a new level of contributions. However, the Conference of Consulting Actuaries White Paper on Actuarial Funding Policies and Practices for Public Pension Plans recommends that the "phase-in period should be no longer than the time period until the next review of assumptions." **Because experience studies are performed every three years,**

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we recommend the phase-in period for the impact of assumption changes be reduced to no longer than three years (Recommendation #2).

Optional Hybrid Plan

P.A. 100-0023 created an Optional Hybrid Plan for current Tier 2 members and future new hires. The Optional Hybrid Plan consists of a reduced defined benefit plan and a defined contribution plan. Employers are required to contribute the normal cost plus an additional 2% of pay for each employee who participates in the Optional Hybrid Plan or Tier 2 in lieu of the Optional Hybrid Plan for fiscal year 2022 and after.

GRS assumes that 0% of current and future participants elect the Optional Hybrid Plan. While the valuation notes that Tier 3 became available to applicable members beginning in fiscal year 2020, however given the uncertainty of election behavior and the small population size GRS assumes all members remain in Tier 2. Given the need to evaluate experience as it emerges for this group, we believe it is reasonable not to reflect the Optional Hybrid Plan in the current valuation. We recommend that GRS review this assumption as part of the next experience study.

Accelerated Pension Benefit Payments

P.A. 100-0587 created two accelerated pension benefit payment options. Inactive vested members have the option of receiving a lump-sum equal to 60% of the present value of their benefits in lieu of their annuity benefits, the “Total Buyout”. This program is available until June 30, 2026. The “COLA Buyout” program provides Tier 1 members the option upon retirement of accepting the reduced Tier 2 automatic annual increase (AAI) provision instead of their current 3% automatic annual increases. In exchange for electing the reduced AAI, members will receive a lump-sum equal to 70% of the present value of the reduction in annuity benefits. The State finances the program by issuing bonds up to certain limits. Lump-sum payments will be made directly from the bond proceeds. This program expires June 30, 2026, or earlier if funds are no longer available.

For the draft June 30, 2024 report, GRS has assumed that 3% of inactive participants will elect the “Total Buyout” of their pension benefit. Further, GRS has assumed that 20% of eligible Regular formula members, 45% of eligible Alternative Formula members not covered by Social Security, and 40% of Alternative Formula members covered by Social Security, will elect the “COLA Buyout” at retirement. The election percentages are assumed to apply until the end of the Buyout Programs, June 30, 2026. GRS notes these “COLA Buyout” assumptions are based upon experience through June 2023 provided by the System and this year they provided support for the assumption on page 46. We believe these election assumptions for the Accelerated Pension Benefit Payment Program are reasonable.

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SECTION III – SUPPORTING ANALYSIS

Stress Testing

We anticipate GRS will continue including stress testing of the System within the valuation report and include an explanation of the implications that volatile investment returns and a variety of other stressors (e.g., membership declines, lower salary growth, assumption changes) can have on future State costs. The tests illustrate the potential stresses on the System and its contributing sponsors so that an assessment of sustainability can be made.

We note that GRS has included stress testing in the final report for the last several years, but the stress testing section has not been completed in this year’s draft report. Last year, a separate letter dated December 20, 2023 was subsequently provided that contained the stress testing that was ultimately included in the final report. We anticipate that similar stress testing will be included in the final June 30, 2024 Actuarial Valuation.

Actuarial Standard of Practice 51

Actuarial Standard of Practice (ASOP) 51 provides guidance to actuaries on the assessment and disclosure of risks to help readers of the actuarial valuation report “*understand the effects of future experience differing from the assumptions used*” and “*the potential volatility of future measurements resulting from such differences.*”

ASOP 51’s first requirement is to “*identify risks that, in the actuary’s professional judgment, may reasonably be anticipated to significantly affect the Plan’s future financial condition.*” GRS lists six example sources of risk on page 16 of the draft report: investment risk, asset/liability mismatch risk, contribution risk, salary and payroll risk, longevity risk, and other demographic risks. With the exception of the contribution risk due to the statutorily required amount of contributions, the risks GRS identified are relatively generic and would apply to most pension plans. GRS notes that Section J of the report identifies and discusses key risks facing the System. This section is not included in the draft June 30, 2024 Actuarial Valuation, however the section was included in the final June 30, 2023 Actuarial Valuation.

ASOP 51 requires the actuary to assess each of the risks identified. While the assessment does not have to be quantitative, it does have to take into account the specifics of the individual plan. The following risks were identified in the final June 30, 2023 Actuarial Valuation.

- Investment Risk. GRS included additional stress testing in the last year’s final actuarial valuation report that adequately assessed the investment risk with various investment return scenarios.
- Assumption Change Risk. GRS assessed the impact of a change to the discount rate assumption in Section J by projecting the impact of a change to 6.25%. If other assumption changes, like updates to mortality or retirement rates, are viewed as significant GRS may want to assess them in future valuations.

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- Contribution Risk. GRS discusses several issues with the statutorily required contribution amounts in the risk section as well as in other parts of the valuation report. The stress testing included in last year’s final actuarial valuation report assessed the impact of changing the contribution requirement to fund to 100% in 2045.
- Demographic Risk. GRS provides an explanation of demographic risks and the stress testing included in last year’s final actuarial valuation report adequately assessed the salary and payroll risk with alternative projected decreases in the active population.

ASOP 51 requires the actuary to recommend a more detailed assessment of risks if it “*would be significantly beneficial.*” GRS adequately identified the primary drivers of these risks, provided background information and assessments about these identified risks. The stress testing included in last year’s final actuarial valuation report provided a quantitative assessment of the investment risk, contribution risk, and salary and payroll risk and we anticipate similar stress testing will be included in this year’s valuation actuarial valuation report. However, the example risks noted on page 16 the draft June 30, 2024 Actuarial Valuation were only qualitatively described in a manner that could apply to any pension plan.

Section 3.2 of ASOP 51 requires the actuary to identify risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” In the draft June 30, 2024 Actuarial Valuation, the risks that are significant to the system are not identified though it is noted they will be identified in Section J of the final report. In the final June 30, 2023 Actuarial Valuation, GRS included a letter regarding stress testing that identified the risks that may significantly affect the plan and explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition. We anticipate similar identification and explanation will be included in the final 2024 valuation.

Actuarial Standard of Practice 4

Actuarial Standard of Practice No. 4 (ASOP 4) was amended and the changes first became effective for SERS’ actuarial valuations starting June 30, 2023. The revised ASOP added three requirements for actuarial valuation reports.

Calculate and disclose a Reasonable Actuarially Determined Contribution

GRS does calculate and disclose the funding policy contribution set forth by the Board. We note that this policy meets the requirements of a Reasonable Actuarially Determined Contribution and satisfies the ASOP 4 requirement to calculate and disclose a Reasonable Actuarially Determined Contribution (ADC).

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Implications of the Funding Policy

In the draft June 30, 2024 Actuarial Valuation Report GRS includes disclosures of the implications of the State Mandated Funding Policy:

1. A qualitative assessment that contributions beginning in 2033 through 2045 are expected to be flat as a percentage of total payroll,
2. The unfunded liability is expected to decrease in dollar amount through 2045,
3. A statement that the Unfunded Actuarial Liability is never expected to be paid off, and
4. The funded ratio is expected to increase to 90% in 2045.

Calculation and Disclosure of Low Default Risk Obligation Measure (LDROM)

The draft June 30, 2024 Actuarial Valuation includes a description and calculation of LDROM. This includes an explanation of the discount rate curve, cost method, and assumptions used to calculate LDROM. GRS has also included a comparison of the LDROM to the Accrued Liability and commentary explaining the significance of the LDROM as required by ASOP 4 “with respect to the funded status of the plan, plan contributions, and the security of participant benefits.”

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Assessment of Actuarial Assumptions Used in the 2024 Valuation

A. Economic Assumptions

The economic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Experience Review Report dated July 15, 2022, and the Economic Assumption Update Review dated July 15, 2024, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. Interest Rate

The interest rate assumption (also called the investment return or discount rate) is the most impactful assumption affecting the required State contribution amount. This assumption, which is used to value liabilities for funding purposes, remained at 6.75% for the draft June 30, 2024 Actuarial Valuation.

After reviewing all the materials (see Appendix B) that were made available, Cheiron concludes that the interest rate of 6.75% for this valuation is reasonable.

We recommend the SERS Board continue to annually review the economic assumptions (interest rate, inflation and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly (Recommendation #3).

The items we considered and our rationale for this recommendation are as follows:

- A review of the interest and inflation rates does not involve the collection of significant data and can be updated annually. In addition, it keeps the Board focused more closely on these critical assumptions.
- In GRS's July 15, 2024 Economic Assumption Update Review, they presented the expectations for the SERS portfolio of the Illinois State Board of Investment's investment consultant Meketa Investment Group. Meketa's expected 20-year geometric average return of the SERS portfolio is 7.73% (See page A-1 of GRS's July 15, 2024 Economic Assumption Update Review). Based on the capital market assumptions provided by Meketa, SERS has a 63.47% chance of meeting or exceeding the assumption of 6.75%.
- GRS's July 15, 2024 review of economic assumptions also presented the expectations for the SERS portfolio based on capital market assumptions for a 10-year or shorter time horizon of twelve independent investment consultants and calculated that, adjusting for GRS's assumed rate of inflation, the average expected geometric return

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for the SERS portfolio is 6.87% (See page C-3 of GRS’s July 15, 2024 Economic Assumption Update Review). This analysis estimated SERS has a 51.34% chance of meeting or exceeding the 6.75% assumption over a 10-year time horizon.

In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received (Recommendation #4).

Disclosing the names of the investment consulting firms that participated in the survey will provide added transparency and the ability to review how each firm’s expectations have changed year to year. Market expectations can quickly change to reflect new information, trends and updated outlooks. Thus, knowing when the capital market assumptions were effective is also important.

- GRS also presented the expectations for the SERS portfolio based on capital market assumptions for a 20-year or longer time horizon of eight independent investment consultants. Based on these longer-term assumptions, the average 20-year geometric mean for the SERS portfolio was 7.09% and SERS is estimated to have a 54.82% chance of meeting or exceeding the 6.75% assumption (See page C-3 of GRS’s July 15, 2024 Economic Assumption Update Review, which is reproduced below for ease of reference). In the future, we suggest that GRS disclose more information about these capital market assumptions, including a list of the investment consulting firms included and the dates of the capital market assumptions.

Distribution of 20-year Average Geometric Net Nominal Return

Investment Consultant	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding 6.75 %
	40th	50th	60th	
(1)	(2)	(3)	(4)	(5)
1	5.34%	5.98%	6.61%	37.89%
2	6.13%	6.84%	7.55%	51.22%
3	6.25%	6.95%	7.65%	52.82%
4	6.59%	7.24%	7.89%	57.59%
5	6.58%	7.27%	7.97%	57.58%
6	6.58%	7.34%	8.10%	57.77%
7	6.76%	7.45%	8.15%	60.21%
8	7.00%	7.69%	8.39%	63.47%
Average	6.40%	7.09%	7.79%	54.82%

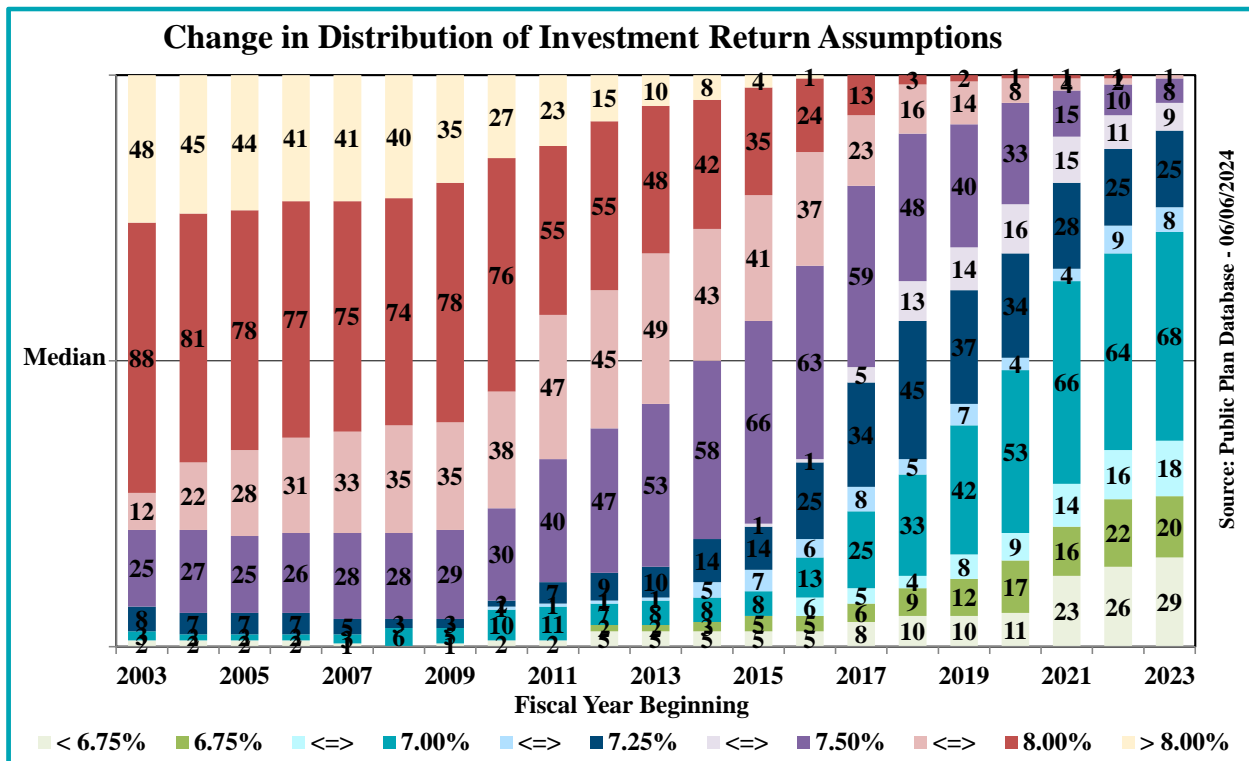
- The combination of the expectations from the Illinois State Board of Investment’s investment consultant and the expectations from a variety of independent investment consultants supports the reasonableness of assuming a 6.75% interest rate for the

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current year. It is prudent not to react to the recent uptick in expected returns until long-term trends are established.

- SERS is projected to have negative cash flow (contribution income less benefit and expense payouts) in Fiscal Year Ending 2024. The cash flow is expected to grow increasingly negative over time to about \$1.4 billion dollars in 2032 as shown in the graph on page 13 and table 4d on pages 34 and 35 of the draft 2024 Actuarial Valuation Report. When short-term returns are expected to be lower than the long-term expectations, which is the current case with SERS, a plan with negative cash flows will tend to have dollar-weighted returns that are less than their “time-weighted” returns.
- While the discount rate assumption should be based on the future expected investment returns for the System’s investment portfolio, survey information can provide an important context for evaluating the assumption. The Public Plans Database is maintained by a partnership between the Center for State and Local Government Excellence (SLGE) and the Center for Retirement Research at Boston College with support from the National Association of State Retirement Administrators (NASRA). This database contains historical information on large public pension plans, including key assumptions used in their actuarial valuations. The following chart shows the distribution of investment return assumptions for the 186 plans in the Public Plans Database with consistent information from 2003 through 2023 as of June 6, 2024.

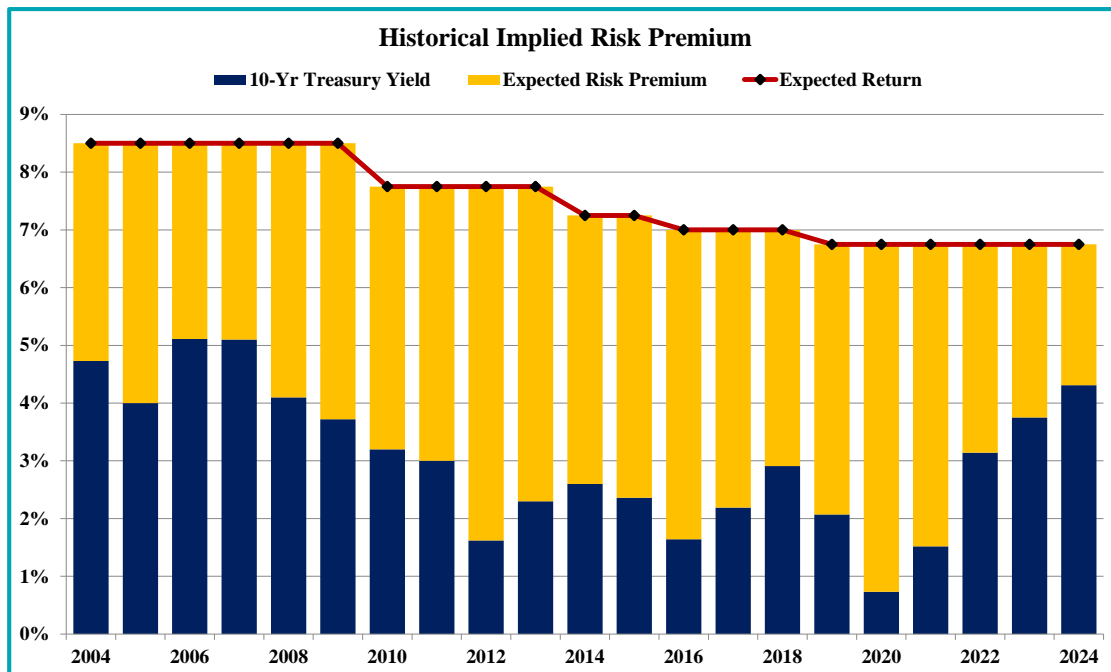


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Over the period shown, there continues to be a pattern of reducing discount rates partially reflecting long-term changes in capital markets, interest rates and underlying inflation. Of the 186 plans shown, 128 have reduced their discount rate assumption since 2019. For these plans, the average reduction is 0.39%.

- Over the last two decades, declining interest rates have forced pension plans to either reduce their discount rates, increase their exposure to investment risk, or some combination of the two. For example, as shown in the chart below, in June 2006, the yield on 10-year Treasury bonds (a proxy for a risk-free investments) reached a high in the 20-year period of 5.1%. To achieve SERS' then assumed return of 8.50%, the System's investments had to outperform the yield on the 10-year Treasury by 3.4%. In June 2020, the yield on the 10-year Treasury had dropped to 0.7%, and to achieve SERS' assumed return of 6.75%, the System's investments need to exceed the 10-year Treasury yield by 6.05%. Even though SERS had reduced its return assumption by 175 basis points over the period, it still had to take more investment risk in 2020 to meet its assumption than it did in 2006. Since 2020, yields on 10-year Treasury bonds have increased, reducing the expected risk premium needed to achieve the System's assumed return. Yields on 10-year Treasury bonds have been approximately 4% during 2024; therefore, the System's investments currently only need to exceed the 10-year Treasury yield by about 2.75% to achieve the 6.75% assumed return, which is the lowest expected risk premium over the last 20 years. If these higher Treasury bond yields persist, plans may be able to achieve the expected return with less exposure to investment risk. However, if these higher Treasury bond yields prove temporary, plans could quickly find the pressure returning to further reduce discount rates or increase their exposure to investment risk.



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2. Inflation Assumption

As recommended in GRS's July 15, 2024 review of economic assumptions, the inflation assumption remained at 2.25% in the draft June 30, 2024 Actuarial Valuation.

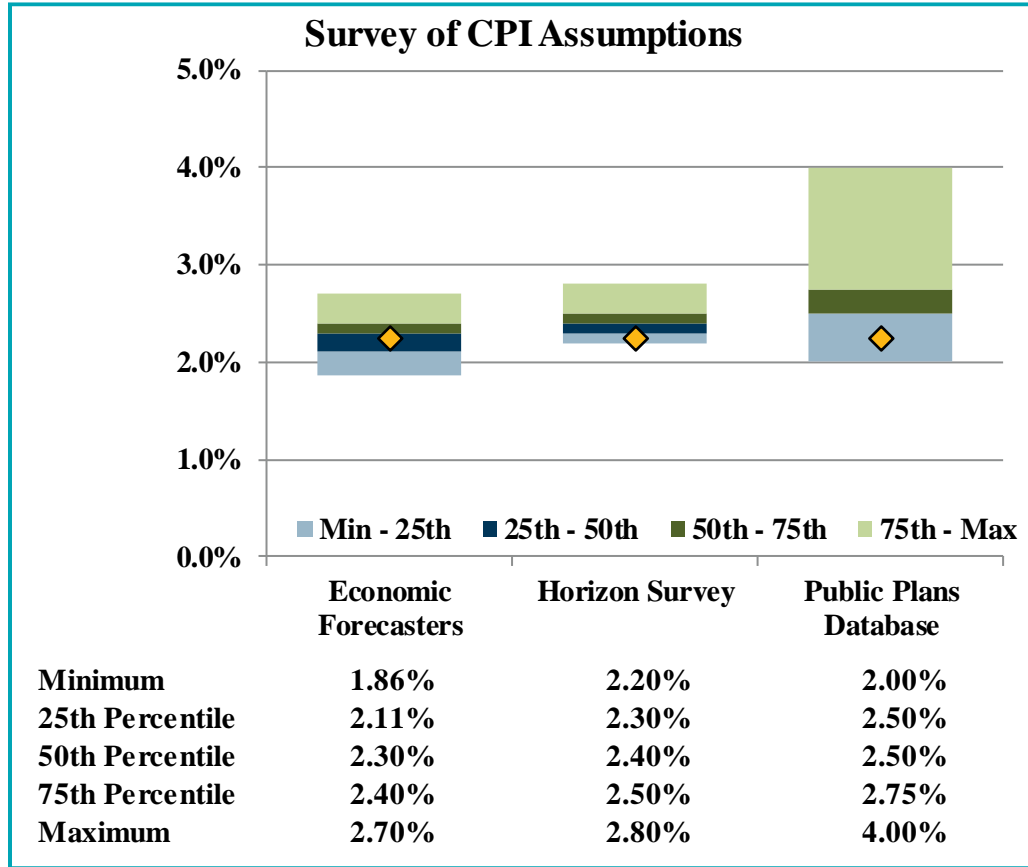
We find the 2.25% inflation assumption to be reasonable.

The items we considered and our rationale for concurring with the 2.25% assumption are as follows:

- GRS's July 15, 2024 review of economic assumptions included a survey of the inflation assumptions of independent investment consultants. The eight investment consulting firms with longer time horizons (20+ years) reported an average of 2.53% and ranged from 2.20% to 2.84%. The twelve firms with a shorter time horizon reported an average of 2.39% and ranged from 2.13% to 2.70%. **As mentioned earlier, in future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received** (Recommendation #4).
- GRS's July 15, 2024 review of economic assumptions also included the forward-looking inflation forecasts from the Federal Reserve Bank of Cleveland as of April 1, 2024. This forecast shows inflation over the next 10 years of 2.34% increasing to 2.45% over 30 years.
- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), inflation will average between 1.8% and 3.0% (<http://www.ssa.gov/oact/tr/2024/tr2024.pdf>). Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.4%.
- The following chart shows the distribution of inflation expectations for the Third Quarter 2024 survey of professional economic forecasters published by the Philadelphia Federal Reserve, the 2024 Horizon survey of investment consultant capital market assumptions (20-year), and the 2023 inflation assumptions used by plans in the Public Plans Database compared to the SERS assumption (indicated by the gold diamonds). The assumption of 2.25% is in the second quartile of the range projected by professional economic forecasters, and lower quartile of the range projected by investment consultants and used by other public pension plans.

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3. Salary (Annual Compensation) Increase Assumption

The salary increase assumption consists of inflation (2.25%), real wage growth (0.50%) and merit or longevity increases that vary by age. Illustrative rates of increase per individual employee per annum, compounded annually are shown in Appendix C.

We find the assumption of 0.50% real wage growth and 2.25% general inflation and the basis for setting them as reasonable and consistent with the inflation assumption. We accept the rationale in the 2024 Economic Assumption Update Review for maintaining the age-based merit/longevity component of the assumption until the next experience study.

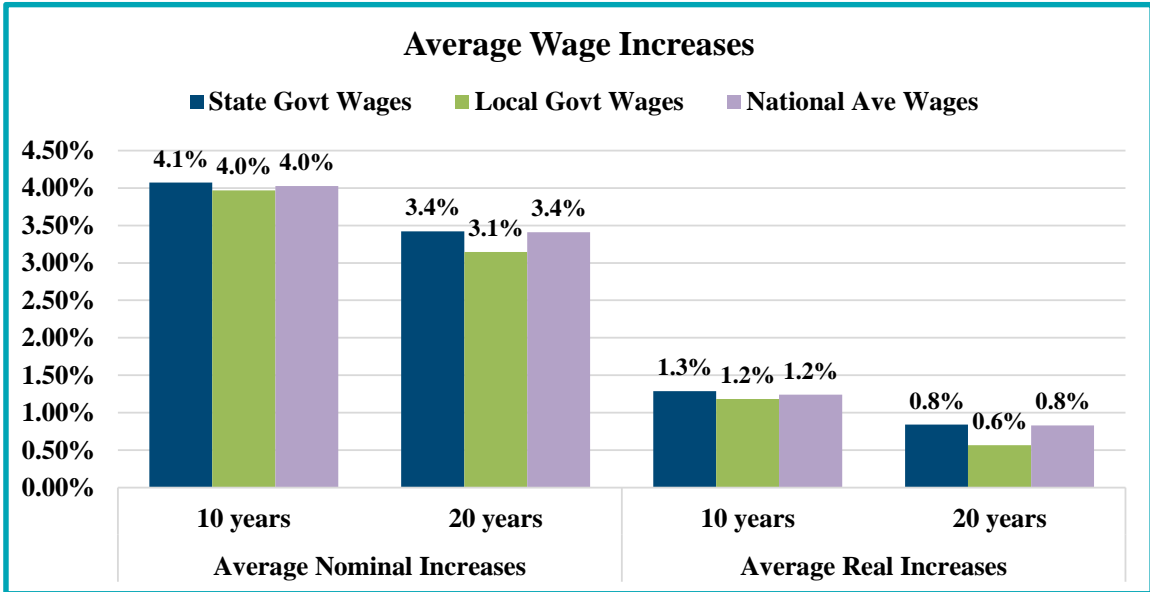
The items we considered and our rationale for concurring with GRS's recommendation of 0.50% real wage growth and 2.25% general inflation are:

- The following chart shows the average nominal and real increases in wages over the last 10 and 20 years for State governments, local governments, and National Average Wages. State and local government data is from the Quarterly Census of Employment

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and Wages as published by the Bureau of Labor Statistics. National Average Wages is published by the Social Security Administration.



- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), real wage differential will average somewhere between 0.53% and 1.74%. Under the intermediate cost projection, the Social Security Administration uses an assumption of 1.14%.
- Although salary increases were higher than assumed in the most recent year, this assumption is a long-term assumption and we believe the 2.75% wage inflation assumption is reasonable.

4. *Expenses*

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

We find the assumption reasonable; however, more information on the expected expenses as a function of capped payroll would be a valuable additional disclosure.

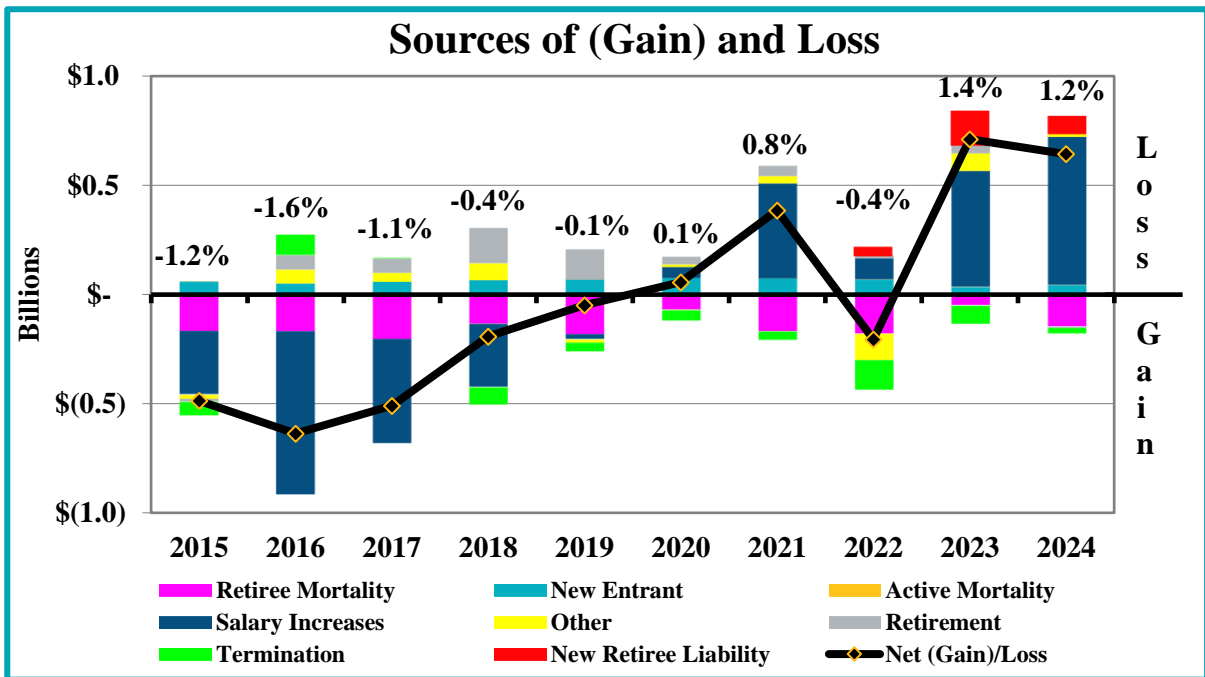
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B. Demographic Assumptions

In its annual actuarial valuation reports, GRS regularly reports sources of liability gains and losses. In the draft June 30, 2024 Actuarial Valuation, these are shown on page 27. In the chart below, we have collected similar data from GRS's past valuation reports dating back to 2015 and use these to present a historical review of past demographic and salary increase experience gains and losses.

The following chart shows the pattern of annual gains and losses attributable to eight different sources as shown in the legend. When the colored bar slices appear above zero on the Y-axis, they represent experience losses with the values representing the increases in liabilities over what was expected. When the bar slices are below zero, they represent experience gains with the values representing the reductions in the liabilities for that year versus what was expected. The net liability (gain)/loss is shown by the black line. This net (gain)/loss as a percent of liability for each year is shown as the percentage above the bars.



The percentages shown above the bars refer to net (gain)/loss as a percentage of liability.

Key observations from this chart are as follows:

1. SERS has experienced overall losses in four of the last five years after five straight years of gains. The gains and losses over the period are primarily driven by salary (dark blue bar) experience.
2. Retirement experience has resulted in a loss in 8 out of the last 10 years. Based on last year's recommendation to explain the consistent retirement losses, GRS provided data on

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losses from New Retiree Liability. These losses represent liability for members that were not present in the prior year's data. GRS has identified \$84.0 million loss as of June 30, 2024, \$159.3 million loss as of June 30, 2023, and \$44.4 million loss as of June 30, 2022, for a total of \$287.7 million over the last three years. In the draft 2024 actuarial valuation, GRS provided a participant data reconciliation which provides the number of new retiree participants reflected in this year's valuation. GRS should continue to monitor this new retiree liability each year and to identify the participants associated with this loss.

3. There have been consistent gains due to retiree mortality before and after COVID.
4. Salary increase experience has created the most volatility in (gain) and loss from year to year, but the (gain) and loss from salary increases offsets itself resulting in a net cumulative gain of \$31 million over the 10-year period.
5. In every year, there have been small experience losses attributable to new entrants joining SERS. This continuing source of losses due to new entrants is expected for most pension plans. This is because members who are hired after the valuation date may earn a partial year of service credit that does not show up until the following valuation, at which point the extra liabilities for their initial partial year are treated as a liability loss. These losses could be anticipated in future assumptions through a load developed in anticipation that new entrants will begin on average with some past service credits.

The demographic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Experience Review Report dated July 15, 2022, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. Mortality

Post-Retirement Mortality

The mortality basis was updated with the June 30, 2022 Actuarial Valuation and uses different tables for general retirees covered under the Regular Benefit Formula and Public Safety retirees covered under the Alternative Benefit Formula. In the 2021 Experience Study, the analysis of mortality by GRS begins with the mortality tables from the Pub-2010 Public Retirement Plans Mortality Tables Report published by the Society of Actuaries and the Retirement Plans Experience Committee. For both general and public safety retirees, the below-median income tables were used as the baseline table. GRS provided an explanation for selecting the Below-Median Income for use as a baseline table on page 44 of the draft June 30, 2024 Actuarial Valuation.

The mortality assumption for general retirees is based on the Pub-2010 Below-Median Income General Healthy Retiree Mortality tables, sex distinct multiplied by 91% for males and 115% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales.

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The mortality assumption for Public Safety retirees is based on the Pub-2010 Below-Median Income Public Safety Healthy Retiree Mortality tables, sex distinct, multiplied by 97% for males and 103% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales.

The base tables are based on an appropriate published mortality table, with scaling factors developed reflecting the Plan's experience and credibility. Mortality improvement is projected on a generational basis using the most recent mortality improvement scale published by the Society of Actuaries.

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

The mortality basis was updated with the June 30, 2022 Actuarial Valuation and uses different tables for general employees covered under the Regular Benefit Formula and Public Safety employees covered under the Alternative Benefit Formula.

The mortality assumption for general active members is based on the Pub-2010 General Employee Mortality headcount-weighted tables, sex distinct, and multiplied by 84% for males and 92% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales. The base table is a published mortality table, and scaling factors were developed reflecting the Plan's experience and credibility.

The mortality assumption for Public Safety employees is based on the Pub-2010 Public Safety Healthy Employee Mortality headcount-weighted tables, sex distinct, multiplied by 90% for males and 100% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales. The base table is a published mortality table, and scaling factors were developed reflecting the Plan's experience and credibility.

It is not clear why the published pre-retirement mortality table GRS selected is headcount-weighted as opposed to salary-weighted. GRS should provide an explanation and justification similar to the post-retirement mortality assumption for selecting a headcount-weighted as opposed to salary-weighted published mortality table for the pre-retirement mortality analysis.

In our opinion, the mortality assumption used by GRS is reasonable.

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C. Funding Methods

Actuarial funding methods consist of three components: (1) the actuarial cost method, which is the attribution of total costs to past, current, and future years; (2) the asset valuation method (i.e., asset smoothing); and (3) the amortization method.

1. Actuarial Cost Method

The System uses the projected Unit Credit cost method (PUC) to assign costs to years of service, as required under the Pension Code (40 ILCS 5/14). **We have no objections with respect to using the PUC method, although we would prefer the Entry Age Normal (EAN) cost method as it is more consistent with the requirement in 40 ILCS 5/14-131 for level percentage of pay funding.**

Under the PUC method, which is used by some public sector pension funds, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the valuation date, but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the Actuarial Liability for a given active participant. Under the PUC cost method, the value of an active participant's benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. While the PUC method is not an unreasonable method, as a result of this pattern of benefit values increasing, more plans use the EAN cost method to mitigate this effect. It should also be noted that the EAN cost method is the required method to calculate liability for GASB Nos. 67 and 68.

2. Asset Valuation Method

The Actuarial Value of Assets for the System is a smoothed market value. Unanticipated changes in market value are recognized over five years in the Actuarial Value of Assets. The primary purpose for smoothing out gains and losses over multiple years is so fluctuations in the contributions will be less volatile over time than if based on the Market Value of Assets.

The 2024 Public Retirement Systems Study by the National Conference on Public Employee Retirement Systems (NCPERS) survey of 157 public retirement funds found that the majority of plans responding to the survey have a five-year smoothing period.

Smoothing the market gains and losses over a period of five years to determine the Actuarial Value of Assets is a generally accepted approach in determining actuarial cost, and we concur with its use.

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3. Amortization Method

The mandated State contribution is based on a determination of the level percentage of payroll that is expected to achieve a 90% funded ratio in 2045. While not a traditional amortization method, this methodology effectively amortizes a portion of the Unfunded Actuarial Liability over the remaining period until 2045, which is currently 21 years.

One of the principles of funding public plans identified by the American Academy of Actuaries is that there should be “a plan to make up for any variations in actual assets from the funding target within a defined and reasonable time period.” Because it only targets 90%, the State method does not include a plan to achieve the funding target over any period of time.

Typical public plan amortization methods are designed to increase each year by expected payroll growth. Under the State mandated method, however, the effective amortization payment increases each year by more than the expected growth in payroll. As a result, the State mandated method defers payments on The Unfunded Actuarial Liability further into the future than under typical public plan amortization methods.

Finally, as the remaining period to achieve 90% funding shortens, the State mandated method will also produce more volatile contributions. Instead of a single fixed period, typical public plan amortization methods use layered amortization bases such that new assumption changes and experience gains and losses are amortized over a new period (e.g., 20 years) while the remaining period for the prior amortization layers becomes one year shorter.

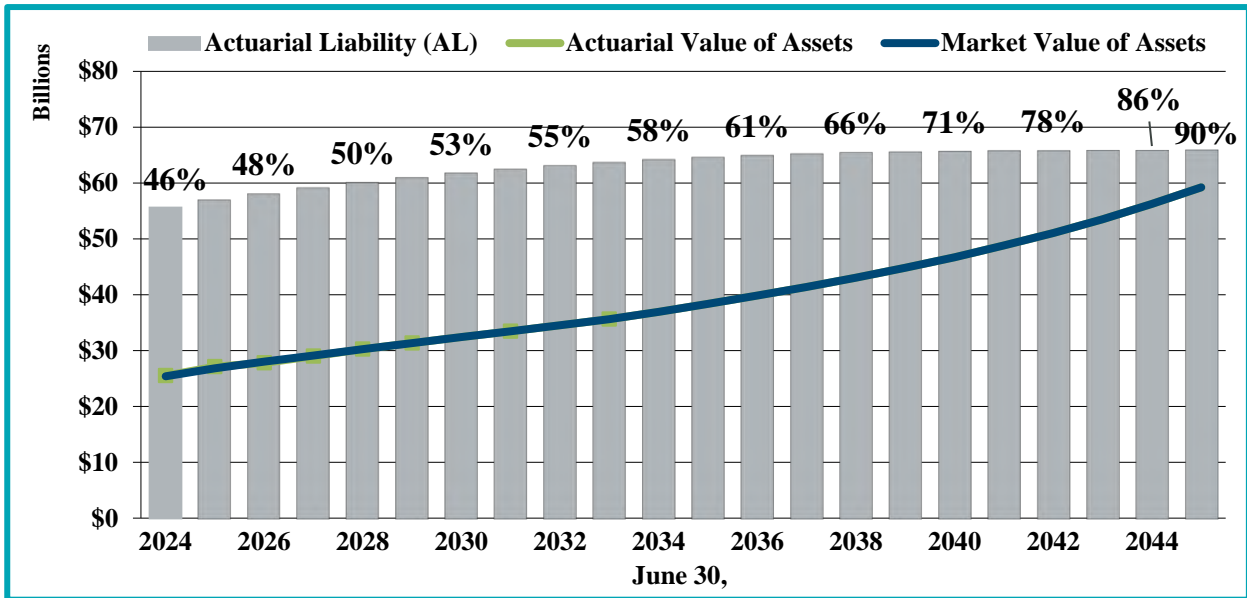
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SECTION IV – PROJECTION ANALYSIS

This section reviews the projections contained in the draft June 30, 2024 Actuarial Valuation of SERS. These projections are fundamental to the development of the required State contribution calculated under the current statutory funding requirement.

The following graphs are independent approximations of the projections performed by the State Actuary to verify that the System's funding projections are reasonable. They do not reflect all the precision of the projections applied by the System's actuary, but instead they are intended to verify the reasonableness of the modeling done by the System's actuary.

The graph below shows our projection of the expected future liabilities and assets in the System through 2045. As pointed out on page 12 of the draft June 30, 2024 Actuarial Valuation, the majority of the funding of the System occurs between 2034 and 2045. The **lines show the projected assets** (market value and actuarial value), and the **bars show the projected liabilities** of the System. The funded ratio for every other year is shown at the top of the bars. For example, in 2034, the funded ratio is projected to be approximately 58% with assets of approximately \$37 billion and liabilities of approximately \$64 billion.

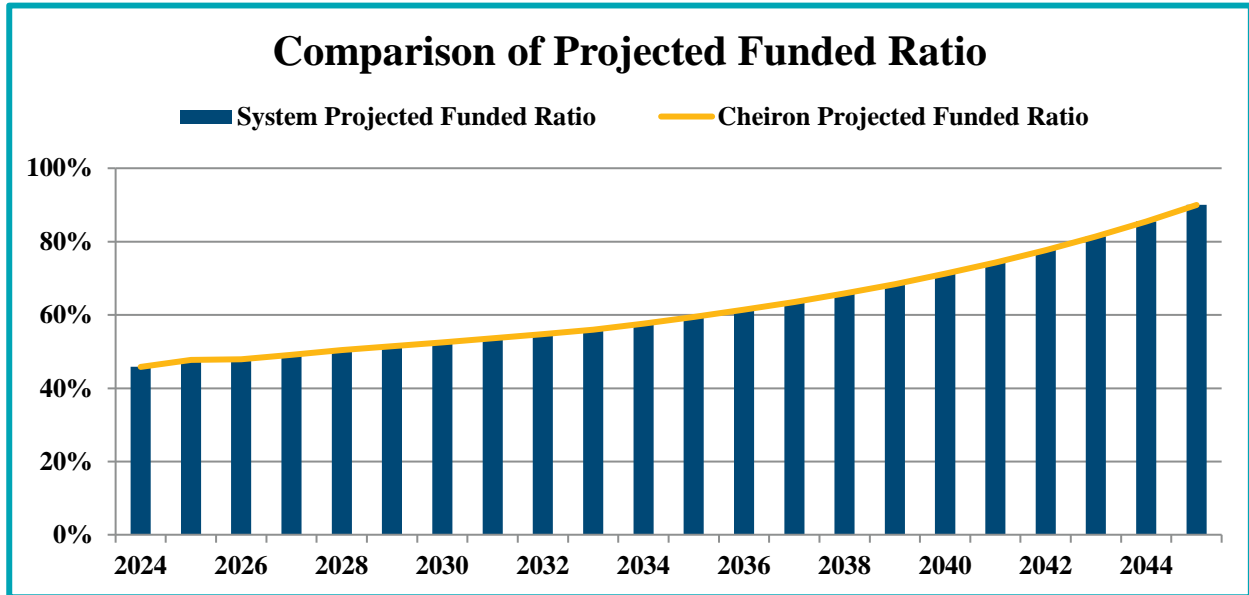


Source: Cheiron projection analysis.

THE STATE ACTUARY'S PRELIMINARY REPORT ON THE
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SECTION IV – PROJECTION ANALYSIS

When we compare our projected funded ratio against the results shown in the draft June 30, 2024 Actuarial Valuation, **we find a close match in expected funded ratio**. This close match of the funded ratio supports that the projections done by the System's actuary are reasonable and the fact we show slightly different funded ratios is a function of Cheiron's approximation.

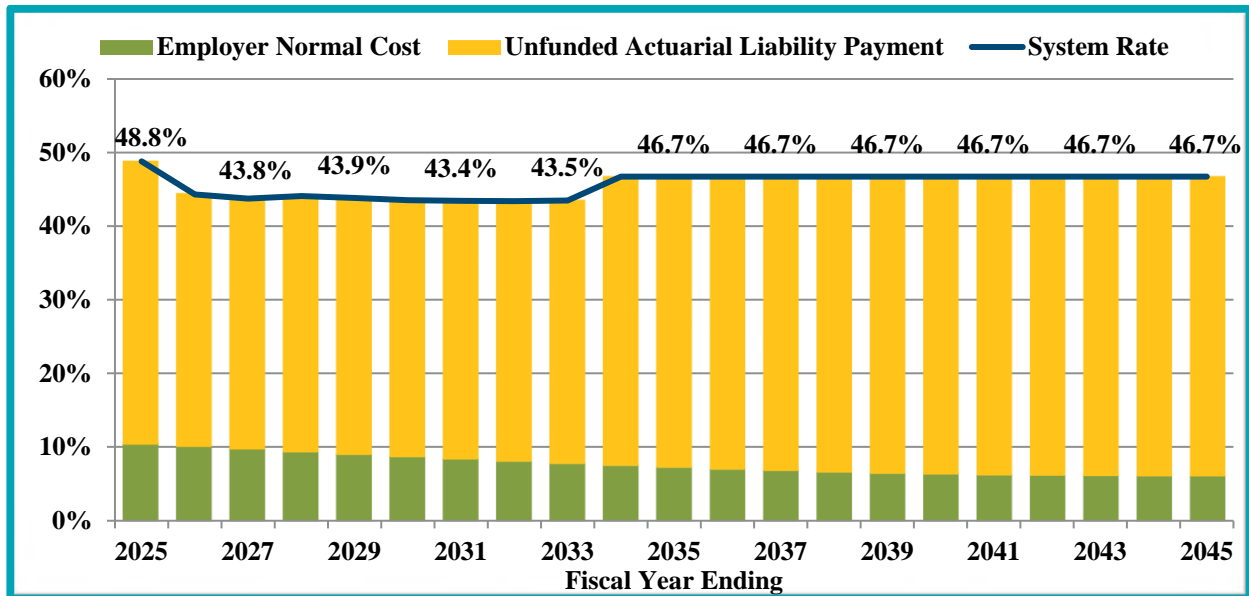


Source: Cheiron projection analysis.

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SECTION IV – PROJECTION ANALYSIS

The following graph shows the expected contributions calculated under the statutory method. The values shown for the fiscal year ending 2025 was set based on the June 30, 2023 Actuarial Valuation. The current valuation is the basis for setting the rates starting July 1, 2025 (Fiscal Year Ending June 30, 2026). The contribution requirement has two components: 1) the employer normal cost, which is the approximate value of the amount of benefits accrued by participants in the upcoming year, less employee contributions, based on the statutory funding method; and 2) an amortization payment on the unfunded liability. The normal cost amounts are shown by the green bars and the amortization payments of the Unfunded Actuarial Liability (UAL) amounts by the yellow bars. The percentages shown are the total contribution rates as a percentage of payroll calculated by Cheiron, which are equal to the sum of the bars. The graph shows that larger percentages of the total contribution are being made toward the UAL payments later in the period. The blue line shows the projected contribution rates as percentages of payroll from the System actuary’s draft June 30, 2024 Actuarial Valuation. The difference between Cheiron’s approximation and the System’s projections is the difference between the top of the bars and the line. In this instance, there is virtually no difference. The contributions are being limited by the maximum contribution described in the General Obligation Bond Act prior to 2033, which is why the rate increases after 2033.



Source: Cheiron projection analysis.

Our conclusion is that **the projections performed by the System’s actuary are reasonable.**

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

In this section, we examine the adequacy of the funding for the System, including funded ratio, the sources of changes in the Unfunded Actuarial Liability (UAL), projections of the UAL, and statutory funding requirements compared to contributions needed to pay down the UAL.

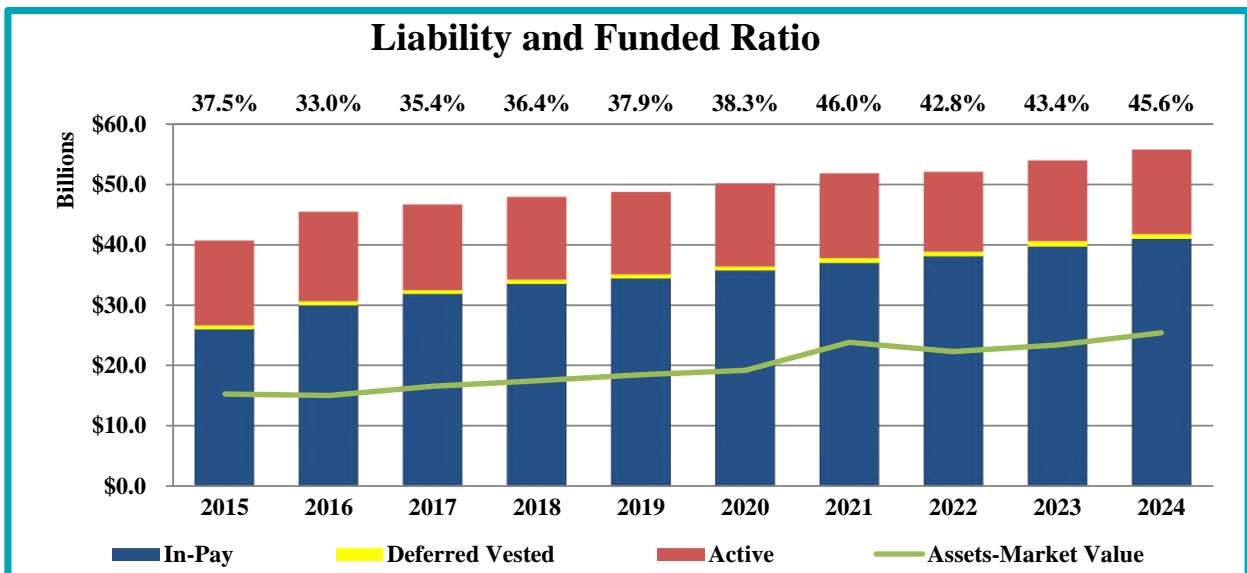
The actuarial valuation report prepared by GRS includes both traditional actuarial measurements, as well as additional risk measurements that are shown on pages 17 to 22 of the draft June 30, 2024 Actuarial Valuation report. GRS also identified and assessed risk measurements in Section J of their final 2023 Actuarial Valuation Report. Given the unique and substantial funding challenges faced by the Illinois pension systems, this additional information is quite important and supplements the information we present here on funding adequacy to better inform the legislature and other stakeholders about the adequacy of the System’s funding.

System Funded Ratio

The first funding adequacy measure we present is the trend in funded ratio for the past 10 years. Funded ratio for this measure is defined as the ratio of the Market Value of Assets to the Actuarial Liability. The chart below shows SERS’ funded ratio since 2015 has gone from 37.5% funded to 45.6% funded in 2024, an increase in funded ratio of 8.1%. In addition to showing the funded ratio, this chart also shows the breakdown of the Plan’s liabilities by membership status:

- Active liability – the liability (attributable to service already performed) for future payments to members who are currently working in the System,
- Deferred Vested liability – the liability for future payments to members who are no longer working in the System but due a benefit, and
- In-Pay liability – the liability for future payments to retirees and beneficiaries who are currently receiving benefits.

This breakdown shows that today plan assets only cover about 62% of the liabilities for just those members currently in pay status.



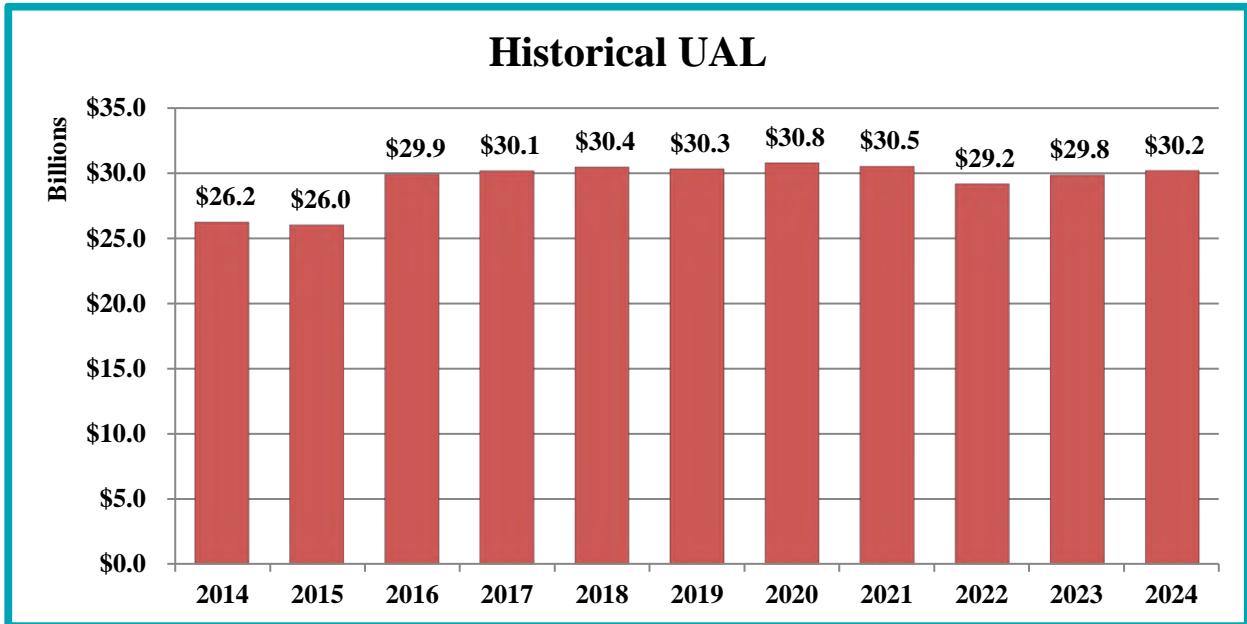
Source: Cheiron analysis of funding adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Sources of Changes in the UAL

As shown in the chart below, since 2016 SERS' Unfunded Actuarial Liability (UAL) has remained relatively level ranging from a low of \$29.2 billion to a high of \$30.8 billion compared to the current level of \$30.2 billion.



Source: Cheiron analysis of funding adequacy

It is important to understand the sources contributing to the changes in UAL. The following analysis and graph provide the changes to the UAL from June 30, 2014 to June 30, 2024 from the following components:

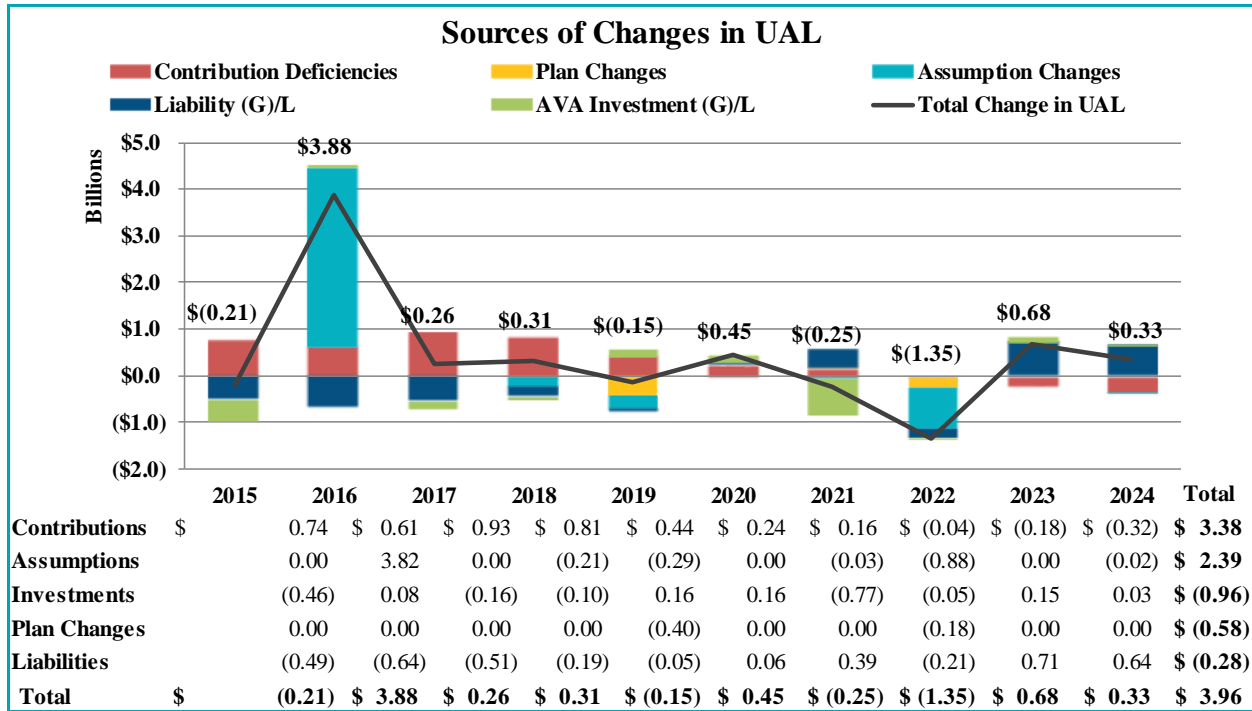
- **Contribution Deficiencies** – Contributions that are less than the tread water contribution cause the UAL to increase. The tread water contribution consists of two components: the normal cost, which is the cost of benefits earned in a given year, and the interest on the Unfunded Actuarial Liability. This sum is referred to as the tread water contribution because it is the contribution necessary so that the UAL will remain constant, or “tread water” (absent experience gains or losses). Contributions were below tread water until 2022, and since then have exceeded tread water. The differences between actual contributions and the tread water contributions have increased the UAL by \$3.38 billion over this period.
- **Assumption Changes** - Changes to actuarial assumptions as the System updated expectations, primarily on future investment returns and life expectancy. A positive aspect of the UAL increases due to assumption changes is that they are expected to result in liability measurements that more accurately reflect future expectations. Over this period, assumption changes have increased the UAL by \$2.39 billion.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

- **Plan Changes** - Modifications of the design of the Plan, which have affected benefits already accrued. Since most of the changes to the System's plan affect only future benefits the impact has been negligible during this period, reducing the liability by \$0.58 billion over this period.
- **Liability (Gain) or Loss** - Changes in the UAL due to liability experience (i.e., mortality, terminations, salary increases, etc.). These were generally small but decreased the UAL by \$0.28 billion over this period.
- **AVA (Actuarial Value of Assets) Investment (Gain) or Loss** - Net investment gains or losses due to assets earning more or less than assumed. These have decreased the UAL over this period by \$0.96 billion.

The chart below shows the changes in UAL each year broken into these five components. The sum of all the components, as the total change in UAL, is shown as the black line. Values of each component as well as total by year are shown in the chart along with the totals for the period.



Source: Cheiron analysis of funding adequacy.

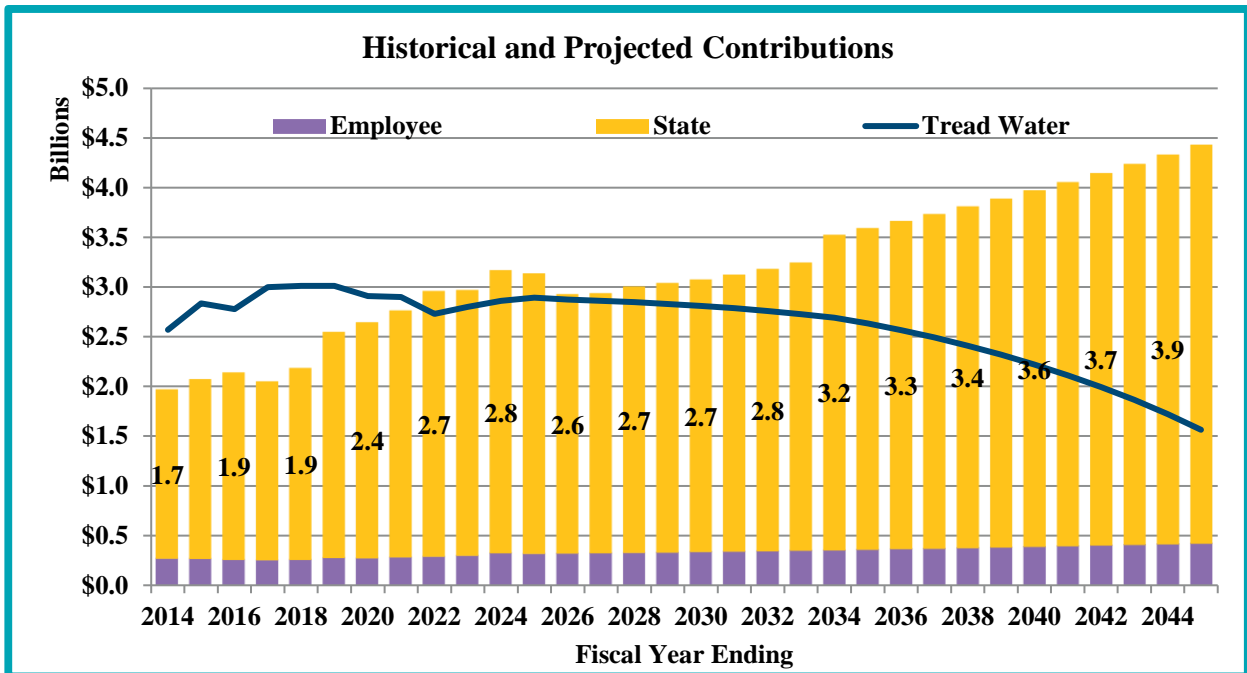
We expect that this chart will help stakeholders understand the sources of growth in the UAL over the past decade and inform discussions about the current funding requirements and adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Actual Contributions Compared to Tread Water Contribution

One of the historical sources of the increase in UAL is due to actual contributions to the System being less than the tread water contribution (the amount needed to prevent the UAL from increasing if all assumptions are met). As the chart below shows, actual contributions were significantly less than the tread water cost through 2021. When the total contributions are above the tread water cost (blue line), the UAL is expected to decline. Beginning in 2022, the contributions from the State have increased and contributions have exceeded the tread water cost.



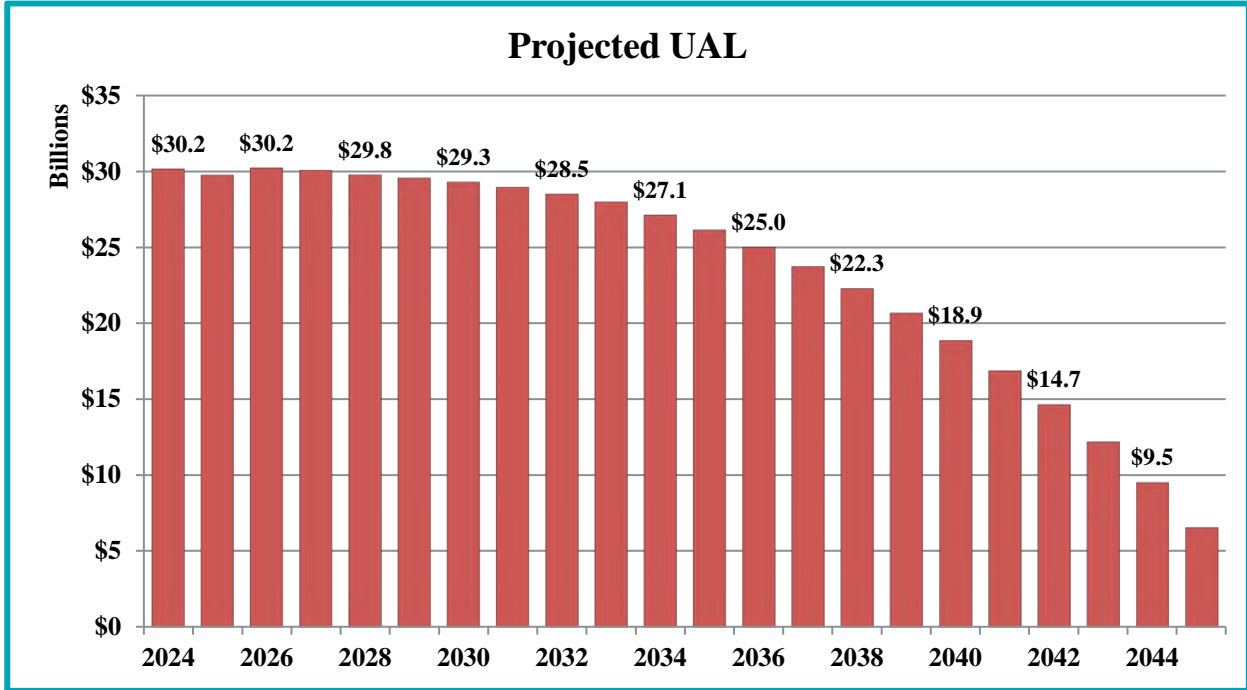
Source: Cheiron analysis of funding adequacy.

The System’s actuary commented that “the statutory funding method generates a contribution requirement that is less than a Reasonable Actuarially Determined Contribution”. It isn’t clear what standard the System’s actuary is using to make this determination.

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The next chart shows that if the statutory contributions continue to be made each year and all other assumptions are met, the UAL is projected to decline from \$30.2 billion in 2024 to \$6.6 billion in 2045. As illustrated in the chart below, the UAL is projected to be fairly level until 2031 before the UAL starts to noticeably decline.



Source: Cheiron analysis of funding adequacy.

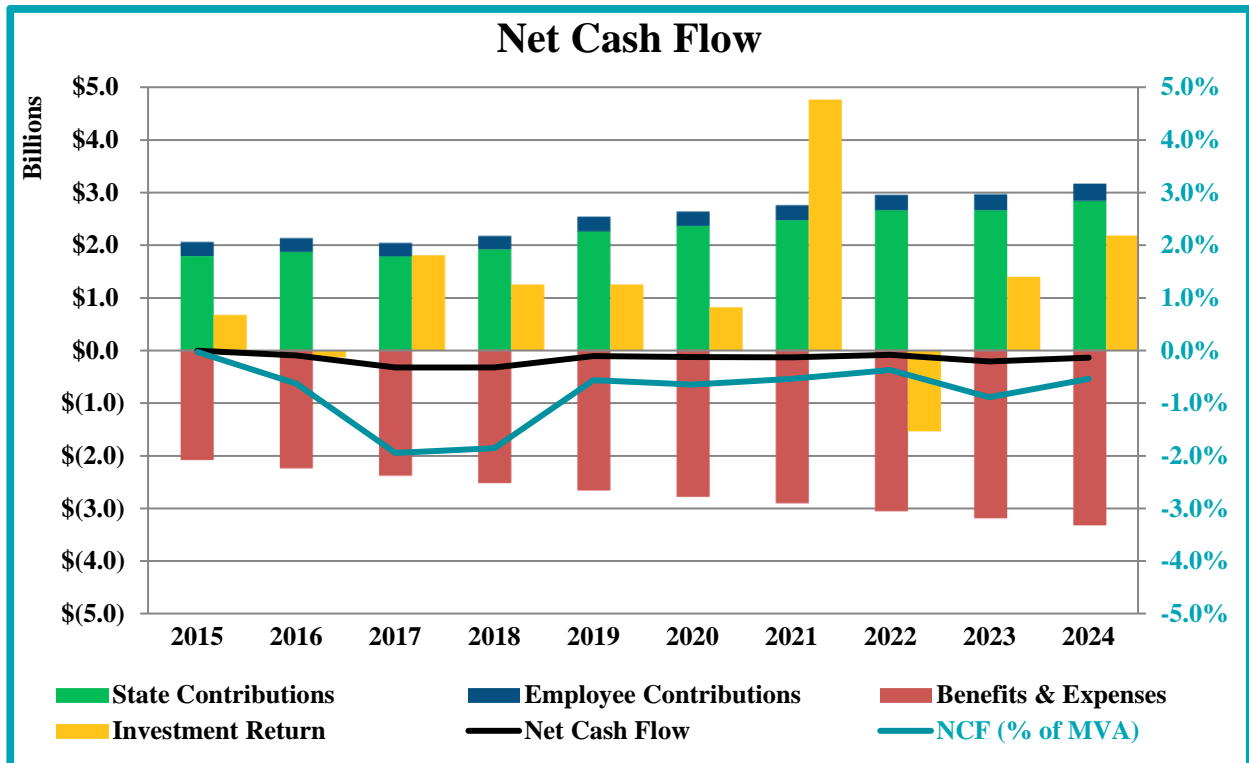
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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Net Cash Flow Analysis

The Plan's net cash flow is defined as State and employee contributions less benefit payments and administrative expenses. The more negative net cash flow is as a percentage of the plan's assets, the more vulnerable the Plan is to market downturns. When a pension plan has more payouts than contributions and suffers an investment loss, it is left with fewer assets to invest and recapture during a recovery.

Looking at the chart below, SERS has slightly negative net cash flow (black line). If contributions increase as quickly as benefit payments, the net cash flow will remain stable. But if contributions do not continue to grow either because the Plan has become better funded or because the expected contributions are not made, negative net cash flow may become a more significant issue, therefore it should continue to be monitored. The teal line shows net cash flow as a percent of Market Value of Assets on the right-side axis. The greater the negative cash flows are relative to plan assets, the more vulnerable a plan is to market downturns. This is because once there is a market downturn, the plan assets lose on both the return and the negative cash flow, leaving a lower asset base from which to recover from the loss.



Source: Cheiron analysis of funding adequacy.

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

Response to Recommendations in 2023

In the State Actuary’s Preliminary Report on the State Employees’ Retirement System of Illinois dated December 18, 2023, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in either the System’s comments last year or in this year’s draft June 30, 2024 Actuarial Valuation.

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.	Not Implemented	<p>The System has adopted a funding policy that would provide for annual State contributions, the “Actuarially Determined Contribution; however, the actual funding of the System is based on State statute and a change in the funding method and funding policy would require a statutory change.</p> <p>GRS continues to include strong language throughout their report recommending the use of an actuarially sound method and stating clearly that the statutory method is not actuarially sound. We find these statements to be appropriate and support their continuation.</p> <p>Recommendation repeated.</p>
2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.	Not Implemented	<p>This period is determined by Public Act 100-0023 and would require a statutory change.</p> <p>Recommendation repeated.</p>
3. Section 3.2 of ASOP 51 requires the actuary to identify risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” [emphasis added]. The risks currently identified appear to largely duplicate the list of	Implemented	<p>In the GRS letter regarding stress testing dated December 22, 2023, they identify the risks that may significantly affect the plan and explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition.</p>

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
examples in ASOP 51 and could apply to almost any pension plan. For the 2023 valuation, we recommend that the actuary explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition.		Recommendation removed.
4. For each risk identified above, Section 3.3 of ASOP 51 requires the actuary to provide an assessment that takes into account “circumstances specific to the plan.” For some of the identified risks, the actuary has provided a quantitative assessment specific to the plan while for other identified risks, the actuary has only provided a generic statement that could apply to any plan. We recommend that for each identified risk the actuary provide an assessment, preferably quantitative, that considers the specific circumstances of this plan.	Implemented	In the GRS letter regarding stress testing dated December 22, 2023, they provide an assessment that takes into account “circumstances specific to the plan” and provide quantitative assessment specific to the plan. Recommendation removed.
5. GRS has identified \$203.7 million loss over the last two years related to New Retiree Liability. These losses represent liability for retired participants not included in the prior year valuation. We recommend GRS to provide more information related to these losses such as a participant data reconciliation which would identify the number of new lives being valued in the current valuation.	Implemented	In the draft 2024 actuarial valuation report, GRS provides a participant data reconciliation that captures the number of participants that are included in the new retiree liability. Recommendation removed.

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
6. We recommend GRS provide explanation and justification for selecting the Below-Median Income subset for the base mortality table assumptions used in the valuation for retirees and provide justification for selecting the headcount weighted instead of a salary weighted for pre-retirement.	Partially Implemented	GRS added a statement in the draft 2024 actuarial valuation with their justification for selecting the Below-Median Income subset for the base mortality table assumptions for retirees. Although there was no additional justification for selecting the headcount weighted instead of salary weighted mortality for pre-retirement, this recommendation has been removed since pre-retirement mortality would not have a material impact on the valuation. Recommendation removed.
7. We recommend the SERS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.	Implemented	GRS has continued to do this, most recently providing a review in the Economic Assumption Update Review report dated July 15, 2024. We will continue to include this recommendation each year. Recommendation continued.

Chapter Four

Preliminary Report on the Judges' Retirement System

In accordance with 30 ILCS 5/2-8.1, Cheiron, the State Actuary, submitted a preliminary report to the Board of Trustees of the Judges' Retirement System

(JRS) concerning proposed certifications of required State contributions submitted to Cheiron by the Board. The preliminary report was submitted to JRS on November 26, 2024. The preliminary report was based on Cheiron's review of actuarial assumptions included in JRS' 2024 Actuarial Valuation Report.

Following is Cheiron's final preliminary report on the Judges' Retirement System. JRS' written response, provided on December 10, 2024, can be found in Appendix D.

OVERVIEW	
JUDGES' RETIREMENT SYSTEM	
as of June 30, 2024	
Actuarial accrued liability	\$3,101,451,219
Actuarial value of assets	\$1,404,905,481
Unfunded liability	\$1,696,545,738
Funded ratio	45.3%
Employer normal cost	\$28,292,467
State contribution (FY26)	\$151,882,000
Active members	957
Inactive members	24
Current benefit recipients	<u>1,396</u>
Total membership	2,377
Interest rate assumption	6.50%
Inflation assumption	2.25%
Actuarial cost method	Projected Unit Credit
Asset valuation method	5-year Smoothing
Executive Director	Tim Blair
Actuarial Firm	Gabriel, Roeder, Smith & Company
Source: June 30, 2024 JRS actuarial valuation report.	

December 13, 2024

Mr. Frank Mautino
Auditor General
400 W. Monroe Street
Springfield, Illinois 62704

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

Dear Trustees and Auditor General:

In accordance with the Illinois State Auditing Act (30 ILCS 5/2-8.1), Cheiron is submitting this preliminary report concerning the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contribution to the Judges' Retirement System of Illinois (JRS or System) for Fiscal Year 2026.

In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law. We note that the history of inadequate funding has resulted in current and future contribution levels, measured as a percentage of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings and recommendations. Section III provides the supporting analysis for those findings and presents more details on our assessment of the actuarial assumptions and methods employed in GRS's Actuarial Certification, as well as our assessment of GRS's determination of the required State contribution for Fiscal Year 2026. Section III also includes comments on other issues impacting the funding of the Judges' Retirement System, including the implications of Article 18 of the Illinois Pension Code, which establishes the statutory minimum funding requirements for the System. Section IV reviews the projections contained in the draft June 30, 2024 Actuarial Valuation. Finally, Section V provides an analysis of funding adequacy.

In preparing this report, we relied on information (some oral and some written) supplied by JRS and GRS. This information includes actuarial assumptions and methods adopted by the JRS Board, System provisions, the draft June 30, 2024 Actuarial Valuation, the draft 2024 GASB 67/68 Report, the 2024 Valuation Results presentation, the 2021 Actuarial Experience Review, the 2024 Economic Assumption Update Review, and minutes of the plan year 2024 JRS Board of Trustee

meetings. A detailed description of all information provided for this review is contained in the body of our report as Appendix B.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Office of the Auditor General and the Judges' Retirement System of Illinois for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron

SIGNED ORIGINAL ON FILE

Gregory A. Reardon, FSA, EA, MAAA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Michael J. Noble, FSA, EA, FCA, MAAA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Jana R. Bowers, FSA, EA, MAAA
Associate Actuary

**THE STATE ACTUARY’S PRELIMINARY REPORT ON THE
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SECTION I – REPORT SCOPE

Illinois Public Act 097-0694 (the Act) amended the Illinois State Auditing Act (30 ILCS 5/2-8.1) and requires Cheiron, as the State Actuary, to review the actuarial assumptions and valuation of the Judges’ Retirement System of Illinois (JRS or System) and to issue to the JRS Board this preliminary report on the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contributions for Fiscal Year (FY) 2026. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the JRS Board to consider before finalizing its certification of the required State contributions for FY 2026.

While the Act states that just the actuarial assumptions and valuation are to be reviewed, we have also reviewed the actuarial methodologies (funding and asset smoothing methods) employed in preparing the Actuarial Certification, as these methods can have a material effect on the amount of the State contribution being certified. Finally, we have offered our opinion on the implications of Article 18-131 of the Illinois Pension Code, which impacts the contribution amount certified by GRS.

In conducting this review, Cheiron reviewed the draft June 30, 2024 Actuarial Valuation, the draft 2024 GASB 67/68 Report, the 2024 Actuarial Results presentation, the 2021 Actuarial Experience Review, the 2024 Economic Assumption Update Review, and minutes of the plan year 2024 JRS Board of Trustee meetings. The materials we reviewed are listed in Appendix B.

In addition to reviewing the Actuarial Certification of the required State contribution to JRS, the Act requires the State Actuary to conduct a review of the “actuarial practices” of the Board. While the term “actuarial practices” was not defined in the Act, we continue to interpret this language to mean that we review: (1) the use of a qualified actuary (as defined by the Qualification Standards of the American Academy of Actuaries) to prepare the annual actuarial valuation for determining the required State contribution; and (2) the conduct of periodic formal experience studies to justify the assumptions used in the actuarial valuation. In addition, we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2024 Actuarial Valuation.

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SECTION II – SUMMARY OF RECOMMENDATIONS

This section summarizes recommendations from our review of the actuarial assumptions and methods employed in the draft June 30, 2024 Actuarial Valuation of JRS as well as the “actuarial practices” of the JRS Board. Section III of this report contains detailed analysis and rationale for these recommendations.

Proposed Certification of the Required State Contribution

Gabriel, Roeder, Smith & Company (GRS) has determined that the FY 2026 required State contribution calculated under the current statutory funding requirements is \$151,882,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and have reviewed the assumptions on which it was based. We have accepted GRS’s 2024 Actuarial Liability as well as the annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions.

State Mandated Funding Method

1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State’s funding policy to require that the contribution impact of all assumption changes be phased-in over a five-year period.

2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing this phase-in period is under the jurisdiction of State law and not the Retirement System.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

30 ILCS 5/2-8.1 requires the State Actuary to identify recommended changes in actuarial assumptions that the JRS Board must consider before finalizing its certification of the required State contribution. We have reviewed all the actuarial assumptions used in the draft June 30, 2024 Actuarial Valuation and conclude that the assumptions are reasonable in general, based on the evidence provided to us.

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SECTION II – SUMMARY OF RECOMMENDATIONS

Recommended Changes for Future Valuations

3. We recommend the JRS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust these assumptions accordingly.
4. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

GASB 67 and 68

The 2024 JRS GASB 67 and 68 information was provided in a separate report. We find that the assumptions and methods used to prepare the 2024 JRS GASB 67 and 68 schedules are reasonable based on the evidence provided to us.

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SECTION III – SUPPORTING ANALYSIS

In this section we provide detailed analysis and supporting rationale for the recommendations that were presented in Section II of this report.

Proposed Certification of the Required State Contribution

As stated in our summary of recommendations in Section II, we have verified the arithmetic calculations made by GRS to develop the required State contribution, reviewed the assumptions on which it is based, and accepted GRS's 2024 Actuarial Liability as well as the annual projections of future payroll, total normal costs, benefits, expenses, and total contributions. However, in accordance with 30 ILCS 5/2-8.1, our review does not include a replication of the actuarial valuation results.

State Mandated Methods

The Illinois Pension Code (40 ILCS 5/18-131) establishes a method that does not fully fund the System. This law requires the actuary to calculate the employer contribution as the level percentage of projected payroll that would accumulate assets equal to 90% of the Actuarial Accrued Liability in the year 2045 if all assumptions are met. This contribution methodology does not conform to generally accepted actuarial principles and practices. Generally accepted actuarial funding methods target the accumulation of assets equal to 100% of the Actuarial Accrued Liability, not 90%.

We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully fund plan benefits within a reasonable period. (Recommendation #1).

The State Mandated Method is entering a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the plan is ultimately 100% funded within a reasonable period.

The State Mandated Contribution for FY 2026 is sufficient to pay the employer normal cost, administrative expenses, and an amortization payment on the UAL that, if continued at the same percentage of payroll growing at 2.25% each year, would be expected to pay off the UAL in 19.7 years. According to "Actuarial Funding Policies and Practices for Public Plans" published by the Conference of Consulting Actuaries, an amortization period of 25 years or less is considered an "Acceptable Practice, with Conditions" where the conditions primarily relate to the amortization of plan amendments. Consequently, the current contribution amount may be considered reasonable even though the methodology is not reasonable because it does not accumulate assets equal to 100% of the Actuarial Accrued Liability.

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SECTION III – SUPPORTING ANALYSIS

The State Mandated Method will produce increasingly volatile contribution levels as the remaining period to achieve 90% funding shortens. Consequently, when changing to a reasonable ADC, as described above, consideration should be given to a method, such as layered amortization, that produces more stable contribution requirements.

The GRS draft June 30, 2024 Actuarial Valuation includes a calculation of a funding policy based on GASB 25 and 27 expense requirements which would contribute the normal cost plus an amortization payment that would seek to fully pay off the total Unfunded Actuarial Liability over a closed period of not more than 30 years. The JRS Board of Trustees has adopted a separate funding policy to calculate an *Actuarially Determined Contribution (ADC)*. The funding policy calls for a funding amount equal to the normal cost plus a closed 25-year amortization as a level percentage of capped payroll of the Unfunded Actuarial Liability, as of June 30, 2015. As of June 30, 2024, the remaining amortization period is 16 years. This policy defines a method that would ultimately fully fund the Plan and falls within generally accepted actuarial funding methods currently in use for public plans. According to this methodology, the State's contribution amount would be \$183,688,306 for FY 2026 compared to the statutory contribution amount of \$151,882,000. It is important though to recognize that this does not affect the actual funding of the System.

We have reviewed the adopted funding policy. We note that this policy meets the requirements of a Reasonable Actuarially Determined Contribution and satisfies the ASOP 4 requirement to calculate and disclose a Reasonable Actuarially Determined Contribution (ADC). We also agree with its use in the GASB report as an ADC. Finally, while this method is an improvement to the State Mandated Funding Method, it would produce increasingly unstable contributions as 2040 approaches due to the method being a closed period amortization.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State's funding policy to require that the contribution impact of all assumption changes, including changes prior to P.A. 100-0023, be phased-in over a five-year period. As such, the Act delays the recognition of the impact of assumption changes when calculating the contribution requirement of the System. Assumption changes are intended to more accurately anticipate the obligations for funding based on the most recent experience analysis and forward-looking changes to future investment returns. However, only one-fifth of the impact of these changes are now recognized from the date of adoption. The remainder of the impact is recognized over four additional years such that the full impact is only recognized at the end of a five-year period beginning at the date of adoption. This phase-in provides time to adjust to a higher level of contributions. However, the Conference of Consulting Actuaries White Paper on Actuarial Funding Policies and Practices for Public Pension Plans recommends that the "phase-in period should be no longer than the time period until the next review of assumptions." **Because experience studies are performed every three years, we recommend the phase-in period for the impact of assumption changes be reduced to no longer than three years (Recommendation #2).**

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Stress Testing

We anticipate GRS will continue including stress testing of the System within the valuation report and include an explanation of the implications that volatile investment returns and a variety of other stressors (e.g., lower salary growth, assumption changes) can have on future State costs. The tests illustrate the potential stresses on the System and its contributing sponsors so that an assessment of sustainability can be made.

We note that GRS has included stress testing in the final report for the last several years, but the stress testing section has not been completed in this year’s draft report. Last year, a separate letter dated December 19, 2023 was subsequently provided that contained the stress testing that was ultimately included in the final report. We anticipate that similar stress testing will be included in the final June 30, 2024 Actuarial Valuation.

Actuarial Standard of Practice 51

Actuarial Standard of Practice (ASOP) 51 provides guidance to actuaries on the assessment and disclosure of risks to help readers of the actuarial valuation report “*understand the effects of future experience differing from the assumptions used*” and “*the potential volatility of future measurements resulting from such differences*”.

ASOP 51’s first requirement is to “*identify risks that, in the actuary’s professional judgment, may reasonably be anticipated to significantly affect the plan’s future financial condition.*” GRS lists six example sources of risk to JRS on page 13 of the draft report: investment risk, asset/liability mismatch risk, contribution risk, salary and payroll risk, longevity risk and other demographic risks. With the exception of the contribution risk due to the statutorily required amount of contributions, the risks GRS identified are relatively generic and would apply to most pension plans. GRS notes that Section J of the report identifies and discusses key risks facing the System. This section is not included in the draft June 30, 2024 Actuarial Valuation, however the section was included in the final June 30, 2023 Actuarial Valuation.

ASOP 51 requires the actuary to assess each of the risks identified. While the assessment does not have to be quantitative, it does have to take into account the specifics of the individual plan. The following risks were identified in the final June 30, 2023 Actuarial Valuation.

- Investment Risk. GRS included additional stress testing in last year’s final actuarial valuation report that adequately assessed the investment risk with various investment return scenarios.
- Assumption Change Risk. GRS assessed the impact of a change to the discount rate assumption in Section J by projecting the impact of a change to 6.00%. If other assumption changes, like updates to mortality or retirement rates, are viewed as significant GRS may want to assess them in future valuations.

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- Contribution Risk. GRS discusses several issues with the statutorily required contribution amounts in the risk section as well as in other parts of the valuation report. The stress testing included in last year’s final actuarial valuation report adequately assessed the impact of changing the contribution requirement to fund to 100% in 2045.
- Demographic Risks. GRS provides an explanation of demographic risks and the stress testing included in last year’s final actuarial valuation report adequately assessed the salary and payroll risk with alternative projected decreases in the active population.

ASOP 51 requires the actuary to recommend a more detailed assessment of risks if it “*would be significantly beneficial.*” GRS adequately identified the primary drivers of these risks, provided background information and assessments about these identified risks. The stress testing included in last year’s final actuarial valuation report provided a quantitative assessment of the investment risk, assumption change risk, contribution risk, and salary and payroll risk and we anticipate similar stress testing will be included in this year’s actuarial valuation report. However, the example risks noted on page 13 of the draft June 30, 2024 Actuarial Valuation were only qualitatively described in a manner that could apply to any pension plan.

Section 3.2 of ASOP 51 requires the actuary to identify risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” In the draft June 30, 2024 Actuarial Valuation, the risks that are significant to the system are not identified though it is noted they will be identified in Section J of the final report. In the final June 30, 2023 Actuarial Valuation, GRS included a letter regarding stress testing that identified the risks that may significantly affect the plan and explained how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition. We anticipate similar identification and explanation will be included in the final 2024 valuation.

Actuarial Standard of Practice 4

Actuarial Standard of Practice No. 4 (ASOP 4) was amended and the changes first became effective for JRS’ actuarial valuations starting June 30, 2023. The revised ASOP added three requirements for actuarial valuation reports.

Calculate and disclose a Reasonable Actuarially Determined Contribution

GRS does calculate and disclose the funding policy contribution set forth by the Board. We note that this policy meets the requirements of a Reasonable Actuarially Determined Contribution and satisfies the ASOP 4 requirement to calculate and disclose a Reasonable Actuarially Determined Contribution (ADC).

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Implications of the Funding Policy

In the draft June 30, 2024 Actuarial Valuation Report GRS includes disclosures of the implications of the State Mandated Funding Policy:

1. A qualitative assessment that future contributions are expected to be level as a percentage of payroll after 2033,
2. The unfunded liability is expected to decrease in dollar amount through 2045,
3. A statement that the Unfunded Actuarial Liability is never expected to be paid off, and
4. The funded ratio is expected to increase to 90% in 2045.

Calculation and Disclosure of Low Default Risk Obligation Measure (LDROM)

The draft June 30, 2024 Actuarial Valuation includes a description and calculation of LDROM. This includes an explanation of the discount rate curve, cost method, and assumptions used to calculate LDROM. GRS has also included a comparison of the LDROM to the Accrued Liability and commentary explaining the significance of the LDROM as required by ASOP 4 “with respect to the funded status of the plan, plan contributions, and the security of participant benefits.”

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Assessment of Actuarial Assumptions Used in the 2024 Valuation

A. Economic Assumptions

The economic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Experience Review Report dated July 14, 2022, and the Economic Assumption Update Review dated July 3, 2024, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. Interest Rate

The interest rate assumption (also called the investment return or discount rate) is the most impactful assumption affecting the required State contribution amount. This assumption, which is used to value liabilities for funding purposes, remained at 6.50% for the draft June 30, 2024 Actuarial Valuation.

After reviewing all the materials (see Appendix B of this report) that were made available, Cheiron concludes that the interest rate of 6.50% for this valuation is reasonable.

We recommend the JRS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly (Recommendation #3).

The items we considered and our rationale for this recommendation are as follows:

- A review of the interest and inflation rates does not involve the collection of significant data and can be updated annually. In addition, it keeps the Board focused more closely on these critical assumptions.
- In GRS's July 3, 2024 Economic Assumption Update Review, they presented the opinions of eight independent investment consulting firms on the future long-term (20 to 30 year outlook) expected earnings of the System and concluded that, the long-term expected geometric mean of the JRS portfolio is 7.09% (See Exhibit C of the 2024 Economic Assumption Update Review, which is reproduced below for ease of reference). They also presented the distribution of the 20-year average geometric net nominal return for these eight independent consulting firms. This showed that JRS has a 58.38% chance of exceeding the 6.50% assumption (see the fifth column, bottom row in Exhibit C).

In addition, GRS in that same review presented a 10-year outlook based on 12 independent investment consulting firm's capital market assumptions which produced

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a 6.87% expected geometric mean with a 53.89% chance of exceeding the 6.50% assumption.

Distribution of Long-Term Average Geometric Net Nominal Return

Investment Consultant	Distribution of 20 to 30-Year Average Geometric Net Nominal Return			Probability of exceeding 6.50%
	40 th	50 th	60 th	
(1)	(2)	(3)	(4)	(5)
1	5.34%	5.98%	6.61%	41.72%
2	6.13%	6.84%	7.55%	54.78%
3	6.25%	6.95%	7.65%	56.40%
4	6.59%	7.24%	7.89%	61.40%
5	6.58%	7.27%	7.97%	61.13%
6	6.58%	7.34%	8.10%	61.02%
7	6.76%	7.45%	8.15%	63.71%
8	7.00%	7.69%	8.39%	66.86%
Average	6.40%	7.09%	7.79%	58.38%

In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received (Recommendation #4).

Disclosing the names of the investment consulting firms that participated in the survey will provide added transparency and the ability to review how each firm’s expectations have changed year to year. Market expectations can quickly change to reflect new information, trends and updated outlooks. Thus, knowing when the capital market assumptions were effective is also important.

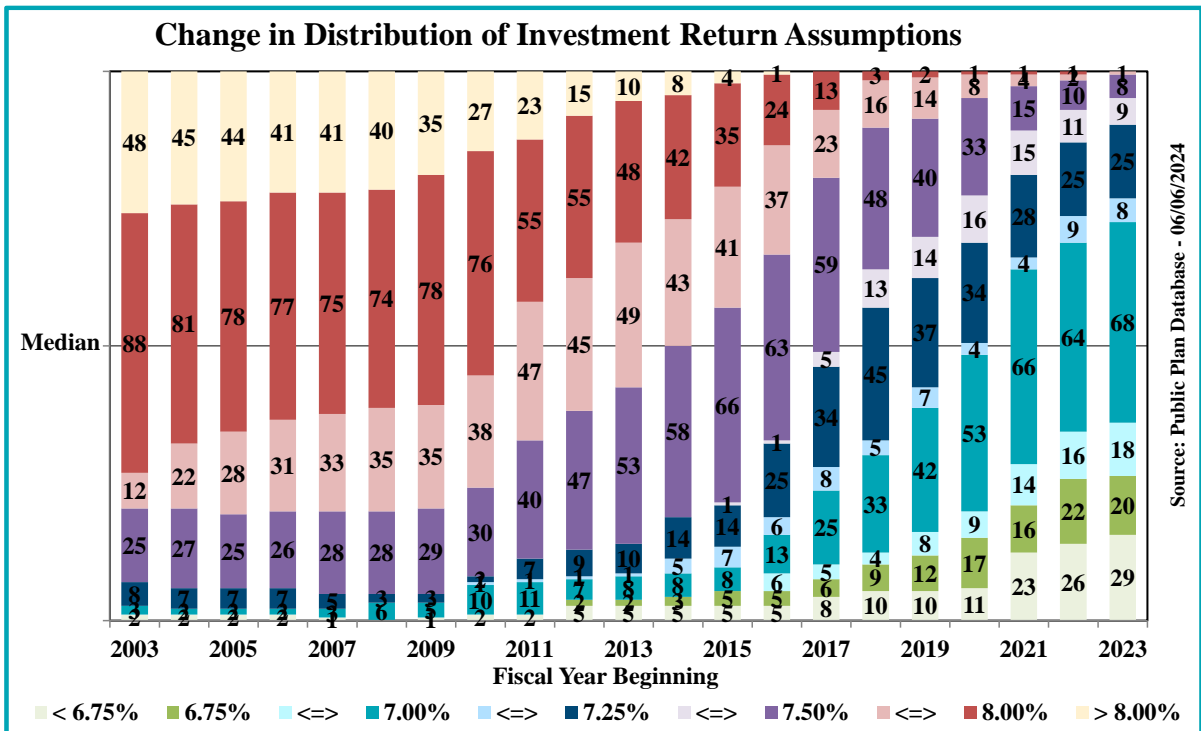
- GRS’s July 3, 2024 Economic Assumption Update Review also presented the expectation of the Illinois State Board of Investment’s investment consultant Meketa Investment Group. After adjusting for GRS’s assumed rate of inflation, Meketa’s expected 20-year geometric average return of the JRS portfolio is 7.69% (See Exhibit A of the GRS 2024 Economic Assumption Update Review). Based on the capital market assumptions provided by Meketa, JRS has a 66.86% chance of exceeding the assumption of 6.50%. Given that JRS is only 45.26% funded on a market asset value, an expectation of achieving the investment return over 65% of the time could result in cost decreases following years that the returns are above the assumption.
- The combination of the expectations from the Illinois State Board of Investment’s investment consultant and the expectations from a variety of independent investment consulting firms supports the reasonableness of assuming a 6.50% interest rate for the

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current year. It is prudent not to react to the recent uptick in expected returns until long-term trends are established.

- JRS experienced a negative cash flow for FY 2024 (contribution income less benefits and expense payouts). The negative cash flow of JRS is currently 2.94% of assets. Negative cash flow is expected to grow in the coming years as shown in the graph on page 10 and table 4d of the draft 2024 Actuarial Valuation. When short-term returns are expected to be lower than the long-term expectations, which is the current case with JRS, a plan with negative cash flows will have actuarial returns (i.e., dollar-weighted returns) that are less than their “time-weighted” returns.
- While the discount rate assumption should be based on the future expected investment returns for the System’s investment portfolio, survey information can provide an important context for evaluating the assumption. The Public Plans Database is maintained by a partnership between the Center for State and Local Government Excellence (SLGE) and the Center for Retirement Research at Boston College with support from the National Association of State Retirement Administrators (NASRA). This database contains historical information on large public pension plans, including key assumptions used in their actuarial valuations. The following chart shows the distribution of investment return assumptions for the 186 plans in the Public Plans Database with consistent information from 2003 through 2023 as of June 6, 2024.

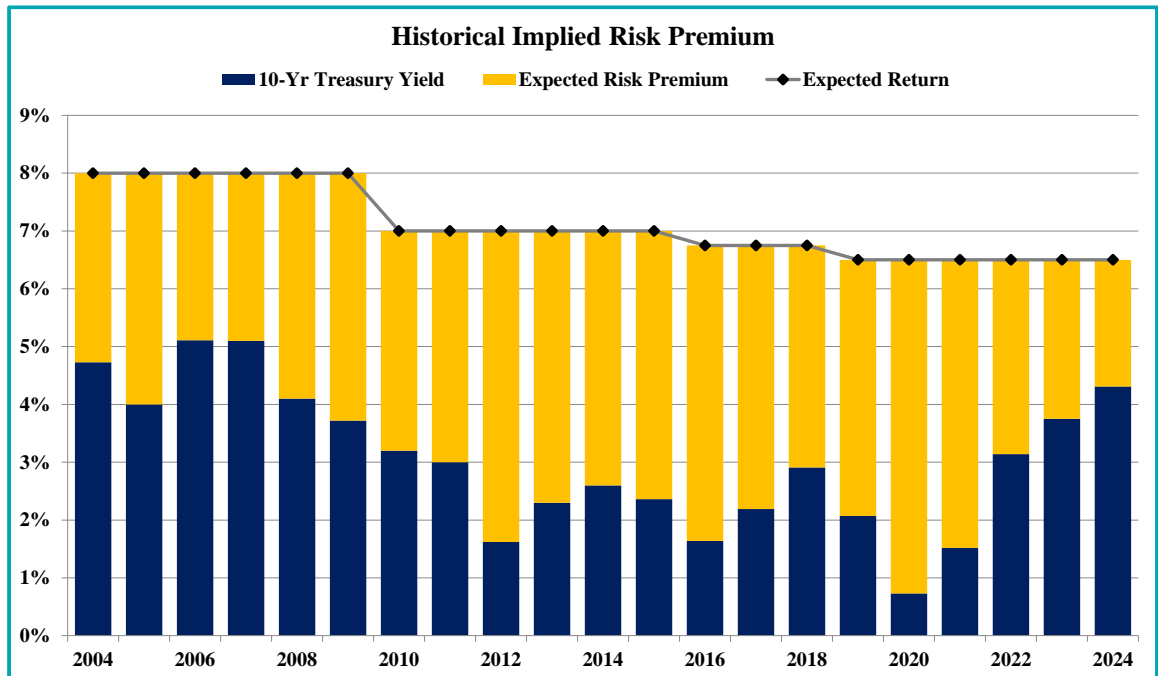


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Over the period shown, there continues to be a pattern of reducing discount rates partially reflecting long-term changes in capital markets, interest rates and underlying inflation. Of the 186 plans shown, 128 have reduced their discount rate assumption since 2019. For these plans, the average reduction is 0.39%.

- Over the last two decades, declining interest rates have forced pension plans to either reduce their discount rates, increase their exposure to investment risk, or some combination of the two. For example, as shown in the following chart, in June 2006, the yield on 10-year Treasury bonds (a proxy for risk-free investments) reached a high in the 20-year period of 5.1%. To achieve JRS' then assumed return of 8.0%, the System's investments had to outperform the yield on the 10-year Treasury by 2.9%. In June 2020, the yield on the 10-year Treasury had dropped to 0.70%, and to achieve JRS' assumed return of 6.50%, the System's investments needed to exceed the 10-year Treasury yield by 5.8%. Even though JRS had reduced its return assumption by 150 basis points over the period, it still had to take more investment risk in 2020 to meet its assumption than it did in 2006. Since 2020, yields on 10-year Treasury bonds have increased, reducing the expected risk premium needed to achieve the System's assumed return. Yields on 10-year Treasury bonds have been approximately 4% during 2024; therefore, the System's investments currently only need to exceed the 10-year Treasury yield by about 2.50% to achieve the 6.50% assumed return, which is the lowest expected risk premium over the last 20 years. If these higher Treasury bond yields persist, plans may be able to achieve the expected return with less exposure to investment risk. However, if these higher Treasury bond yields prove temporary, plans could quickly find the pressure returning to further reduce discount rates or increase their exposure to investment risk.



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2. *Inflation Assumption*

As recommended in the GRS July 3, 2024 Economic Assumption Update Review, the inflation assumption of 2.25% was maintained for the draft June 30, 2024 Actuarial Valuation.

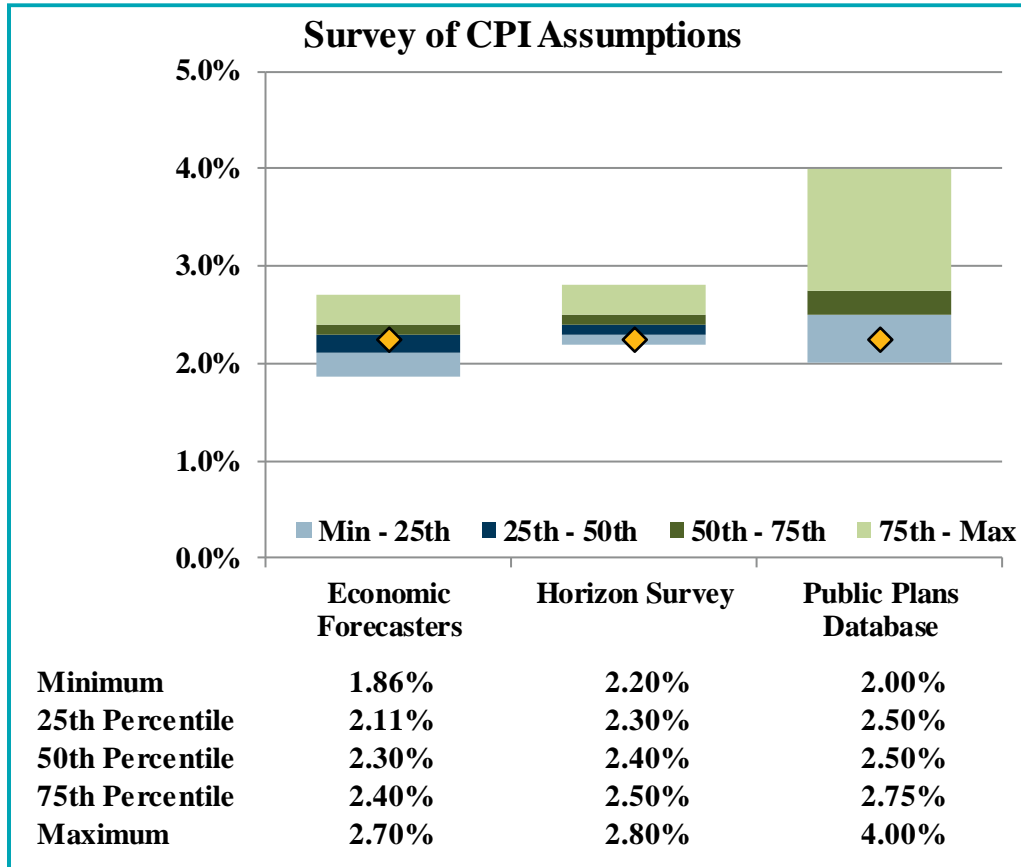
We find the 2.25% inflation assumption to be reasonable.

Our rationale for concurring with the 2.25% assumption:

- GRS's July 3, 2024 Economic Assumption Update Review included a survey of the inflation assumptions of independent investment consulting firms. The eight investment consulting firms with longer time horizons (20+ years) reported an average inflation assumption of 2.53% and ranged from 2.20% to 2.84%. The twelve firms with a shorter time horizon reported an average of 2.39% and ranged from 2.13% to 2.70%. **As mentioned earlier, in future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received** (Recommendation #4).
- GRS's July 3, 2024 Economic Assumption Update Review also included the forward-looking inflation forecasts from the Federal Reserve Bank of Cleveland as of April 1, 2024. This forecast shows inflation over the next 10 years of 2.34% increasing to 2.45% over 30 years.
- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), inflation will average between 1.8% and 3.0% (<http://www.ssa.gov/oact/tr/2024/tr2024.pdf>). Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.4%.
- The following chart shows the distribution of inflation expectations for the Third Quarter 2024 survey of professional economic forecasters published by the Philadelphia Federal Reserve, the 2024 Horizon survey of investment consultant capital market assumptions (20-year), and the 2023 inflation assumptions used by plans in the Public Plans Database compared to the JRS assumption (indicated by the gold diamonds). The assumption of 2.25% is in the second quartile of the range projected by professional economic forecasters and the lowest quartile of the range projected by investment consultants and of the range used by other public pension plans.

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3. Salary (Annual Compensation) Increase Assumption

The salary increase assumption for uncapped payroll is 2.50% per year, compounded annually for all Tier 1 active members, regardless of age or service. It includes components of 2.25% per annum for inflation and 0.25% per annum for productivity. The salary increase assumption for capped payroll is 2.25% per year, compounded annually for all Tier 2 active members, regardless of age or service.

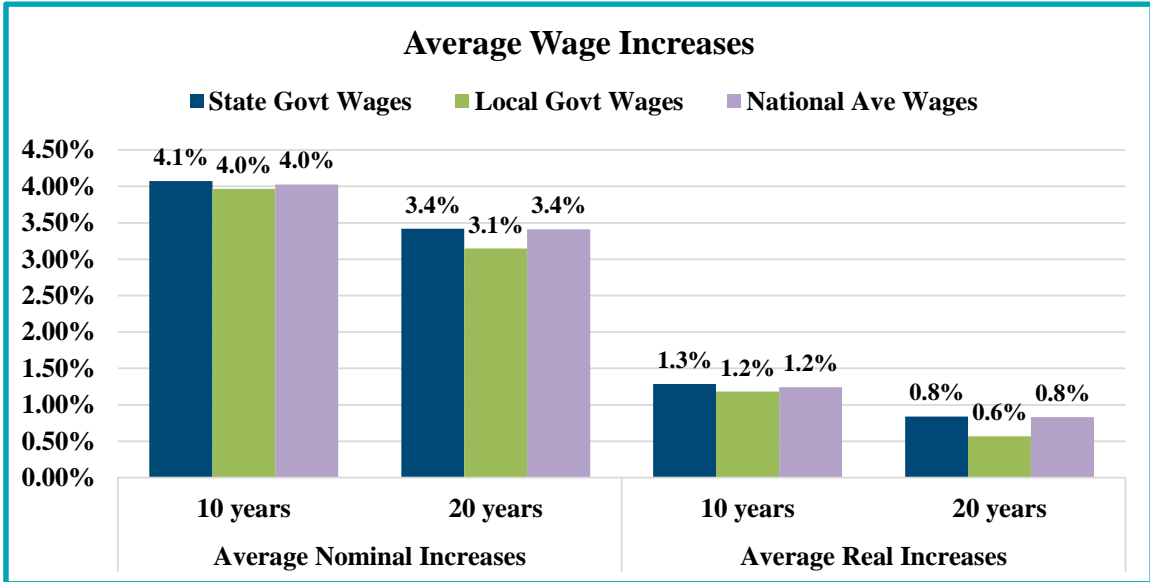
We find the assumption and the basis for setting the assumption reasonable and consistent with the inflation assumption.

Our rationale for concurring with GRS's recommended salary increase assumption:

- The following chart shows the average nominal and real increases in wages over the last 10 and 20 years for State governments, local governments, and National Average Wages. State and local government data is from the Quarterly Census of Employment and Wages as published by the Bureau of Labor Statistics. National Average Wages is published by the Social Security Administration.

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- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), real wage differential will average somewhere between 0.53% and 1.74%. Under the intermediate cost projection, the Social Security Administration uses an assumption of 1.14%.
- Although salary increases were higher than assumed in the most recent year, this assumption is a long-term assumption and we believe the 2.50% and 2.25% salary increase assumption for Tier 1 and Tier 2 active members, respectively, are reasonable.

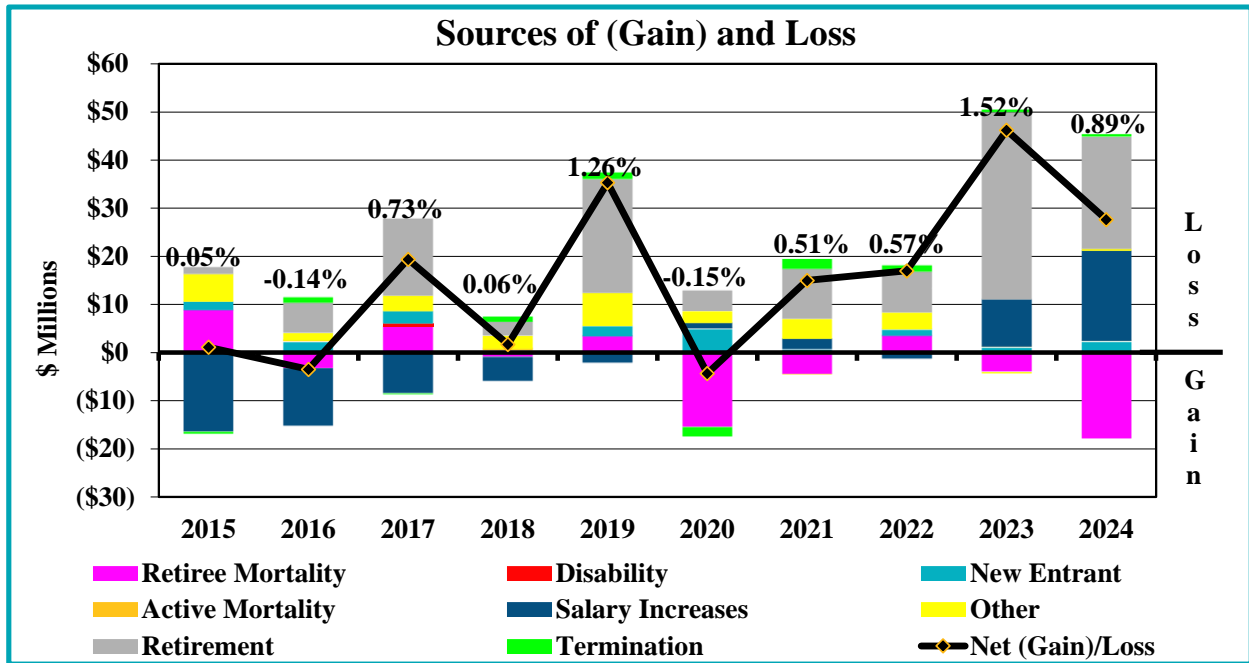
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B. Demographic Assumptions

In its annual actuarial valuation reports, GRS regularly reports sources of liability gains and losses. In the draft June 30, 2024 Actuarial Valuation, these are shown on page 23. In the chart below, we have collected similar data from past valuation reports dating back to 2015 and use these to present a historical review of past demographic and salary increase experience gains and losses.

The following chart shows the pattern of annual gains and losses attributable to eight different sources as shown in the legend. When the colored bar slices appear above zero on the Y-axis, it represents an experience loss with the value representing the increase in liabilities over what was expected. When the bar is below zero, it represents an experience gain for that year with liabilities less than expected. The net liability (gains)/losses are shown by the black line. This net (gain)/loss as a percent of liability is shown above the bars.



The percentages shown above the bars refer to net (gain)/loss as a percentage of liability.

Key observations from this chart are as follows:

1. In the last two years the Plan experienced losses due to salary after consistent significant gains earlier in the period shown. Over the 10-year period the gains and losses have largely offset each other resulting in a net cumulative gain of \$13 million.
2. There have been losses due to retirement in each of the last ten years. We would expect that the rates may need to be adjusted in the next experience study.

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3. Retiree mortality experience has been volatile over the last ten years. In years where there were losses, it means fewer deaths were observed than anticipated. Another way to express this is retirees are living longer than the current mortality assumption predicts. In contrast, in years where there were gains, it means there were more deaths than anticipated. For 2020, there is a sizable gain due to mortality experience which may be attributable to COVID. However, there was an even larger gain due to mortality experience in 2024. We would expect that GRS will continue to monitor this experience and mortality rates may need to be adjusted in the next experience study.
4. Although JRS experienced annual liability losses in seven of the last ten years due to assumed termination rates, the magnitude has been small.

The demographic assumptions are documented in Appendix C. We reviewed the development of these assumptions based on the Experience Review Report dated July 14, 2022, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

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C. Funding Methods

Actuarial funding methods consist of three components: (1) the actuarial cost method, which is the attribution of total costs to past, current, and future years; (2) the asset valuation method (i.e., asset smoothing); and (3) the amortization method.

1. Actuarial Cost Method

The System uses the projected unit credit cost method (PUC) to assign costs to years of service, as required under the Pension Code (40 ILCS 5/18). **We have no objections with respect to using the PUC method, although we would prefer the Entry Age Normal (EAN) cost method, as it is more consistent with the requirement in 40 ILCS 5/18-131 for level percentage of pay funding.**

Under the PUC method, which is used by some public sector pension funds, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the valuation date, but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the Actuarial Liability for a given active participant. Under the PUC cost method, the value of an active participant's benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. While the PUC method is not an unreasonable method, as a result of this pattern of benefit values increasing, more plans use the EAN cost method to mitigate this effect. It should also be noted that the EAN cost method is the required method to calculate liability for GASB Nos 67 and 68.

2. Asset Valuation Method

The Actuarial Value of Assets for the System is a smoothed market value. Unanticipated changes in market value are recognized over five years in the Actuarial Value of Assets. The primary purpose for smoothing out gains and losses over multiple years is so fluctuations in the contributions will be less volatile over time than if based on the Market Value of Assets.

The 2024 Public Retirement Systems Study by the National Conference on Public Employee Retirement Systems (NCPERS) survey of 157 public retirement funds found that the majority of plans responding to the survey have a five-year smoothing period.

Smoothing the market gains and losses over a period of five years to determine the Actuarial Value of Assets is a generally accepted approach in determining actuarial cost, and we concur with its use.

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3. *Amortization Method*

The mandated State contribution is based on a determination of the level percentage of payroll that is expected to achieve a 90% funded ratio in 2045. While not a traditional amortization method, this methodology effectively amortizes a portion of the Unfunded Actuarial Liability over the remaining period until 2045, which is currently 21 years.

One of the principles of funding public plans identified by the American Academy of Actuaries is that there should be “a plan to make up for any variations in actual assets from the funding target within a defined and reasonable time period.” Because it only targets 90%, the State method does not include a plan to achieve the funding target over any period of time.

Typical public plan amortization methods are designed to increase each year by expected payroll growth. Under the State mandated method, however, the effective amortization payment increases each year by more than the expected growth in payroll. As a result, the State mandated method defers payments on the Unfunded Actuarial Liability further into the future than under typical public plan amortization methods.

Finally, as the remaining period to achieve 90% funding shortens, the State mandated method will also produce more volatile contributions. Instead of a single fixed period, typical public plan amortization methods use layered amortization bases such that new assumption changes and experience gains and losses are amortized over a new period (e.g., 20 years) while the remaining period for the prior amortization layers becomes one year shorter.

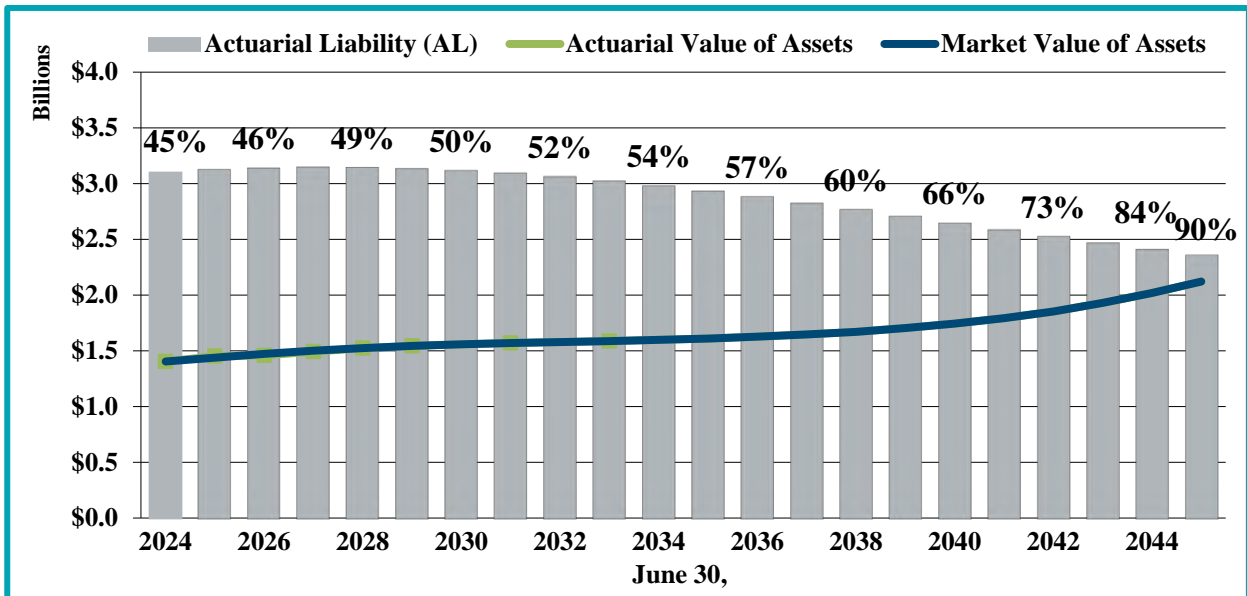
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SECTION IV – PROJECTION ANALYSIS

This section reviews the projections contained in the draft June 30, 2024 Actuarial Valuation of JRS. These projections are fundamental to the development of the required State contribution calculated under the current statutory funding requirement.

The following graphs are independent approximations of the projections performed by the State Actuary to verify that the System's funding projections are reasonable. They do not reflect all the precision of the projections applied by the System's actuary, but instead they are intended to verify the reasonableness of the modeling done by the System's actuary.

The graph below shows our projection of the expected future liabilities and assets in the System through 2045. As pointed out on page 9 of the draft June 30, 2024 Actuarial Valuation, the majority of the funding of the System occurs in the 2nd half of the projections. The **lines show the projected assets** (market value and actuarial value), and the **bars show the projected liabilities** of the System. The funded ratio for every other year is shown at the top of the bars. For example, in 2034, the funded ratio is projected to be approximately 54% with assets being approximately \$1.6 billion and liabilities being approximately \$3.0 billion.

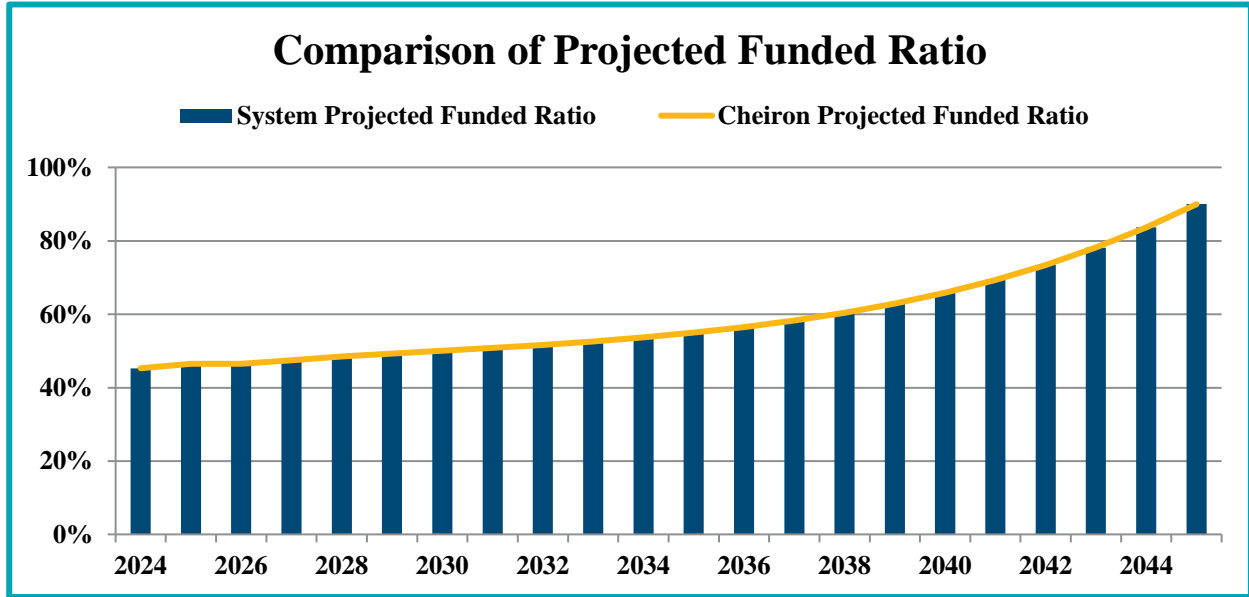


Source: Cheiron projection analysis.

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When we compare our projected funded ratio against the results shown in the draft June 30, 2024 Actuarial Valuation, **we find a close match in expected funded ratio.** This close match of the funded ratio supports that the projections done by the System's actuary are reasonable and the fact we show slightly different funded ratios is a function of Cheiron's approximation.

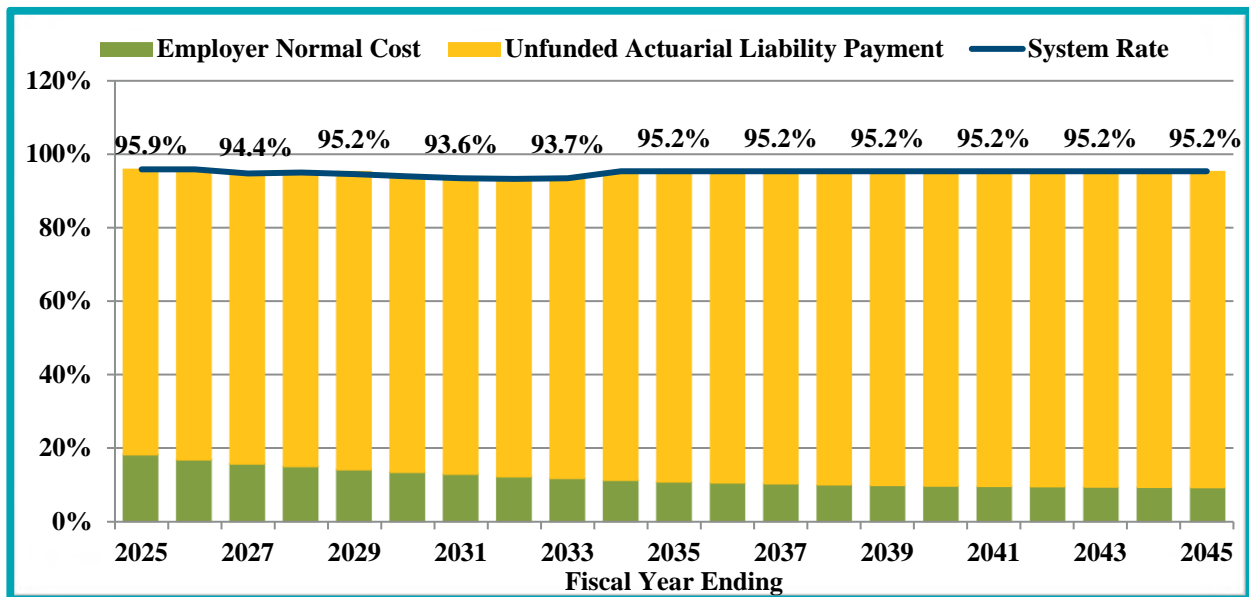


Source: Cheiron projection analysis.

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SECTION IV – PROJECTION ANALYSIS

The following graph shows the expected contribution calculated under the statutory method. The contribution as a percentage of capped payroll for every other year is shown above the bar. The value shown for the fiscal year ending 2025 was set based on the June 30, 2023 Actuarial Valuation. The current valuation is the basis for setting the rates starting July 1, 2025 (Fiscal Year Ending June 30, 2026). The contribution requirement has two components: 1) the employer normal cost, which is the approximate value of the amount of benefits accrued by participants not covered by employee contributions based on the statutory funding method; and 2) an amortization of the unfunded liability. The normal cost amounts are shown by the green bars and the amortization of the Unfunded Actuarial Liability (UAL) amounts by the yellow bars. The percentages shown are the total contribution rates calculated by Cheiron, which are equal to the sum of the bars. The graph shows that a larger percentage of the total contribution is being made toward the UAL payment later in the period. The blue line shows the projected contribution rates as percentages of payroll from the draft June 30, 2024 Actuarial Valuation. The difference between Cheiron's approximation and the System's projections is the difference between the top of the bars and the line. The difference between the two calculations are insignificant. The contributions are being limited by the maximum contribution described in the General Obligation Bond Act prior to 2033, which is why the rate increases after 2033.



Source: Cheiron projection analysis.

Our conclusion is that **the projections performed by the System's actuary are reasonable.**

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

In this section, we examine the adequacy of the funding for the System, including funded ratio, the sources of changes in the Unfunded Actuarial Liability (UAL), and projections of the UAL and statutory funding requirements compared to contributions needed to pay down the UAL.

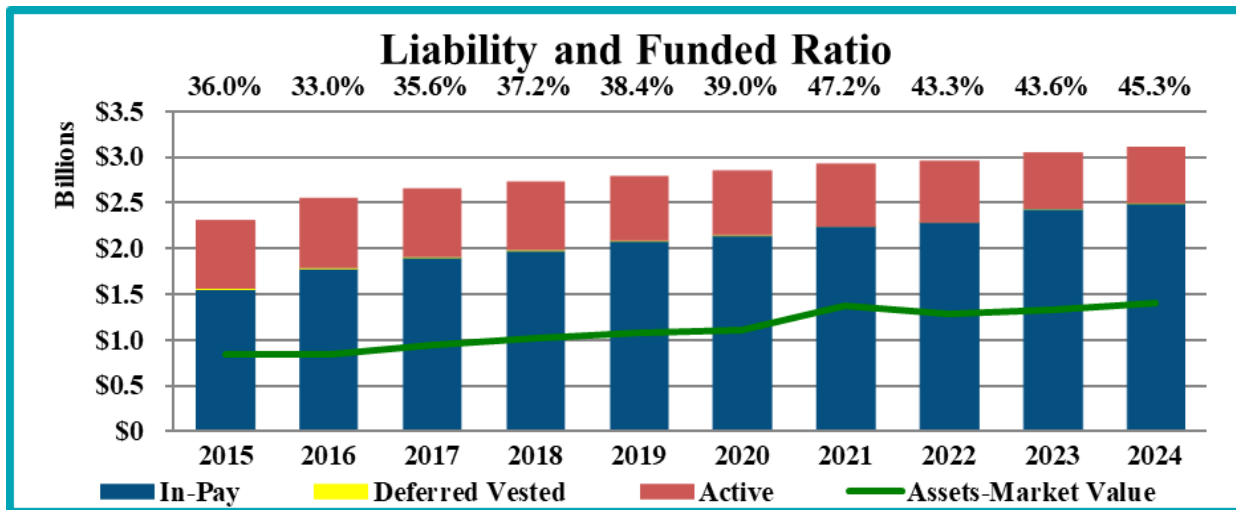
The actuarial valuation report prepared by GRS includes both traditional actuarial measurements, as well as additional risk measurements that are shown on pages 13 to 17 of the draft June 30, 2024 Actuarial Valuation report. GRS also identified and assessed risk measurements in Section J of their final 2023 Actuarial Valuation Report. Given the unique and substantial funding challenges faced by the Illinois pension systems, this additional information is quite important and supplements the information we present here on funding adequacy to better inform the legislature and other stakeholders about the adequacy of the System’s funding.

System Funded Ratio

The first funding adequacy measure is the historical trend of the System’s funded ratio for the past ten years. Funded ratio for this purpose is defined as the ratio of the Market Value of Assets to the Actuarial Liability. The chart below shows JRS’ funded ratio since 2015 has gone from 36.0% funded to 45.3% funded in 2024, an increase in funded ratio of 9.3%. In addition to showing the funded ratio, this chart also shows the breakdown of the Plan’s liabilities by membership status:

- Active liability – the liability (attributable to service already performed) for future payments to members who are currently working in the System,
- Deferred Vested liability – the liability for future payments to members who are no longer working in the System but due a benefit, and
- In-Pay liability – the liability for future payments to retirees and beneficiaries who are currently receiving benefits.

This breakdown shows that today plan assets only cover about 57% of the liabilities for just those members currently in pay status.



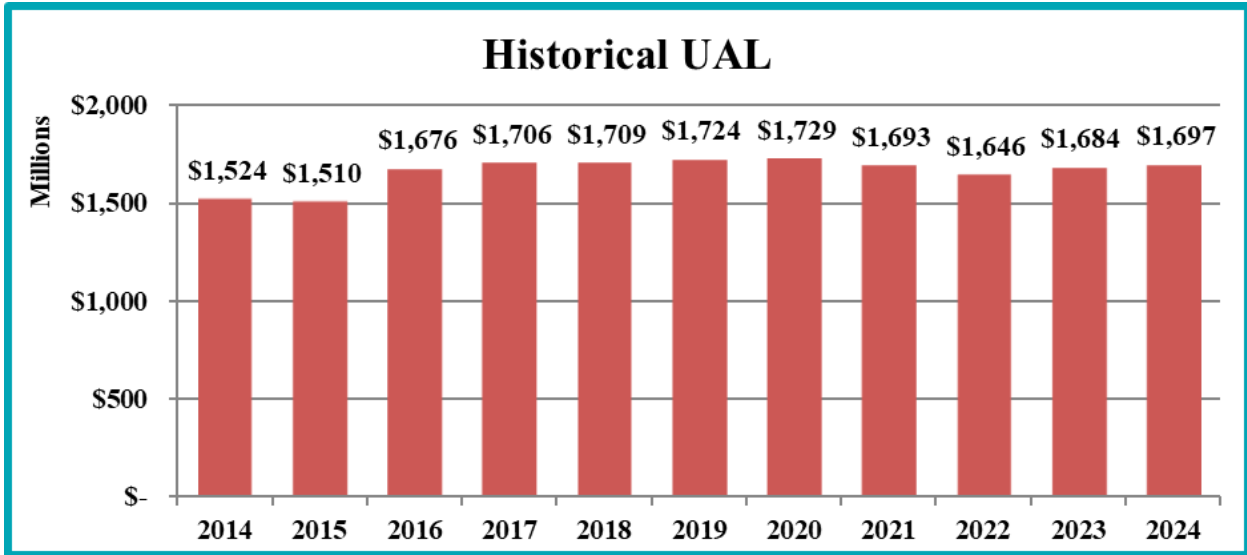
Source: Cheiron analysis of funding adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Sources of Changes in the UAL

As shown in the chart below, JRS' Unfunded Actuarial Liability (UAL) has grown from about \$1.52 billion in 2014 to \$1.70 billion in 2024, an increase of about \$173 million. In order to understand how to reverse this trend, it is important to understand the sources contributing to it.



Source: Cheiron analysis of funding adequacy.

The following analysis and graph provide the changes to the UAL from June 30, 2014 to June 30, 2024 from the following components:

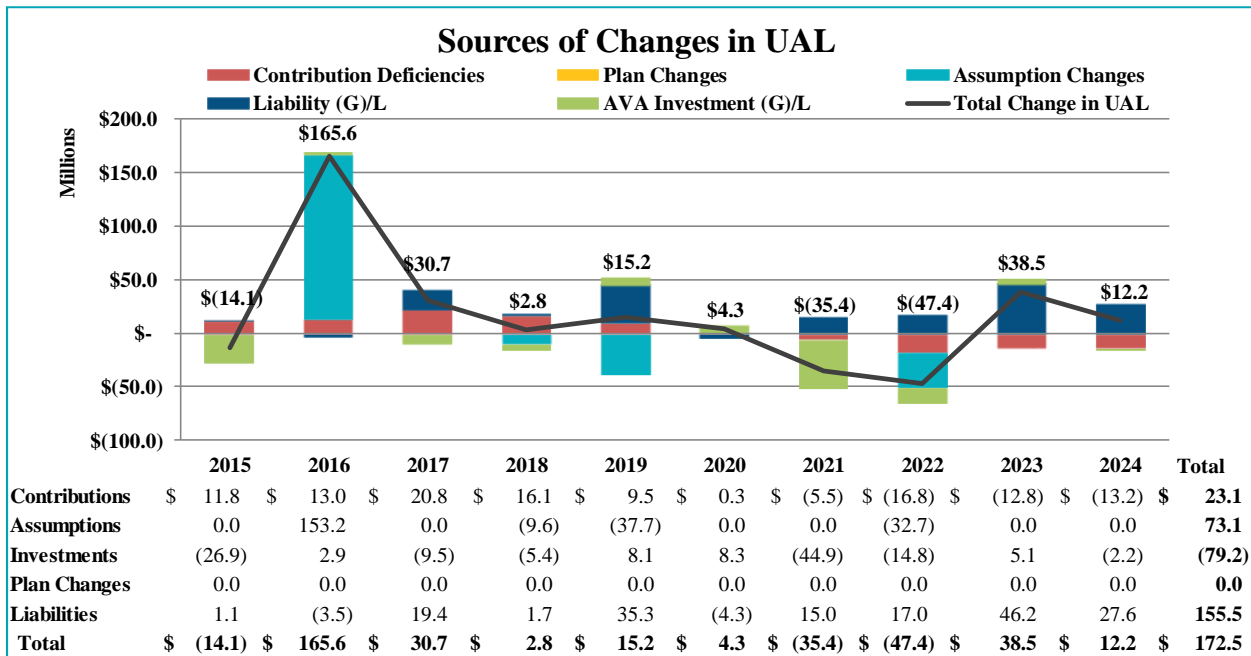
- **Contribution Deficiencies** – Contributions that are less than the tread water contribution causes the UAL to increase. The tread water contribution consists of two components: the normal cost, which is the cost of benefits earned in a given year, and the interest on the Unfunded Actuarial Liability. This sum is referred to as the tread water contribution because it is the contribution necessary so that the UAL will remain constant, or “tread water” (absent experience gains or losses). For each year from 2015-2020, contributions were below tread water which increased the UAL by \$71.4 million. However, since 2021 contributions have been above tread water which decreased the UAL by \$48.4 million. The difference between actual contributions and the tread water contributions increased the UAL by \$23.1 million over this period.
- **Assumption Changes** – Changes to actuarial assumptions over this period increased the UAL by \$73.1 million. A positive aspect of the UAL increases due to assumption changes is that they will result in liability measurements that more accurately reflect future expectations.
- **Plan Changes** – Modifications to the design of the Plan did not occur in this period.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

- **Liability (Gain) or Loss** – The changes in the UAL due to net liability experience (i.e., mortality, terminations, retirements, salary increases, etc.) were volatile and increased the UAL by \$155.5 million over this period. This was the most impactful factor that increased the UAL over the period shown.
- **AVA (Actuarial Value of Assets) Investment (Gain) or Loss** – The net investment gain or loss due to assets earning more or less than assumed decreased the UAL over this period by \$79.2 million.

The chart below shows the changes in UAL each year broken into these five components. The sum of all the components (total change in UAL) is shown as the black line. Values of each component as well as total by year are shown in the chart along with the totals for the period.



Source: Cheiron analysis of funding adequacy.

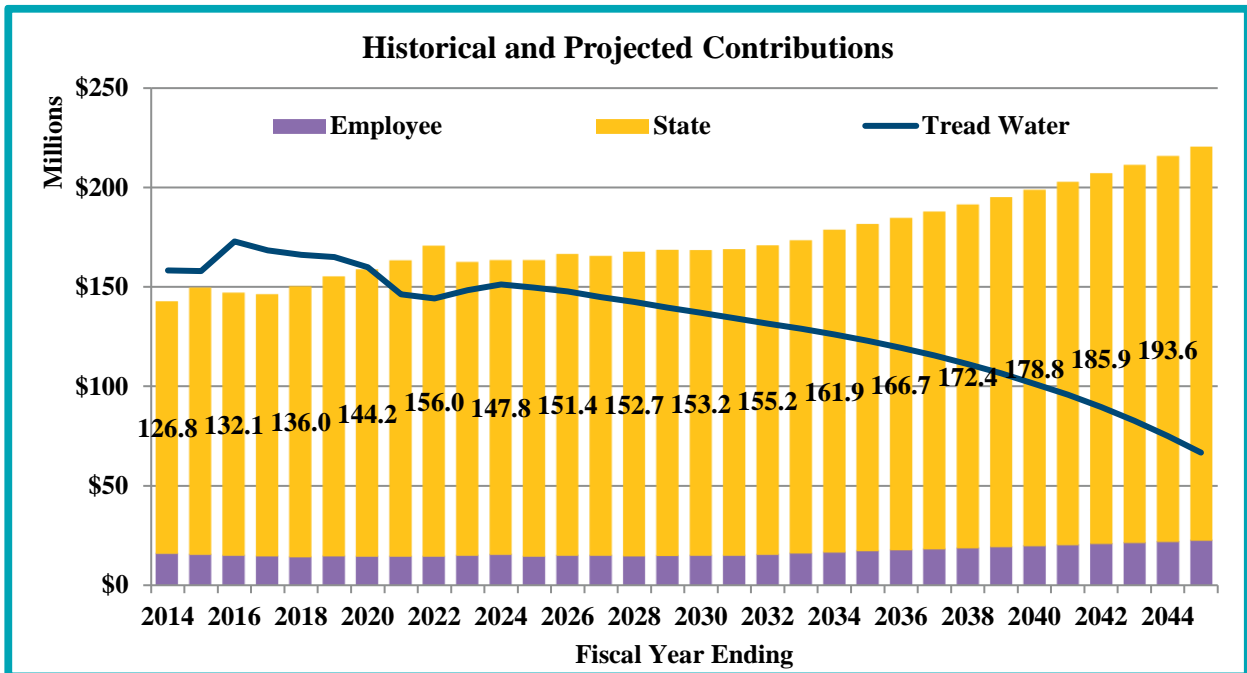
We expect that this chart will help stakeholders understand the sources of growth in the UAL over recent years and inform discussions about the current funding requirements and adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Actual Contributions Compared to Tread Water Contribution

One of the historical sources of the increase in UAL is due to actual contributions to the System being less than the tread water contribution (the amount needed to prevent the UAL from increasing if all assumptions are met). As the chart below shows, actual contributions were less than the tread water cost prior to 2020. When the total contributions are above the tread water cost (blue line), the UAL is expected to decline. Beginning in 2021, the contributions from the State have increased, and contributions have exceeded the tread water cost.



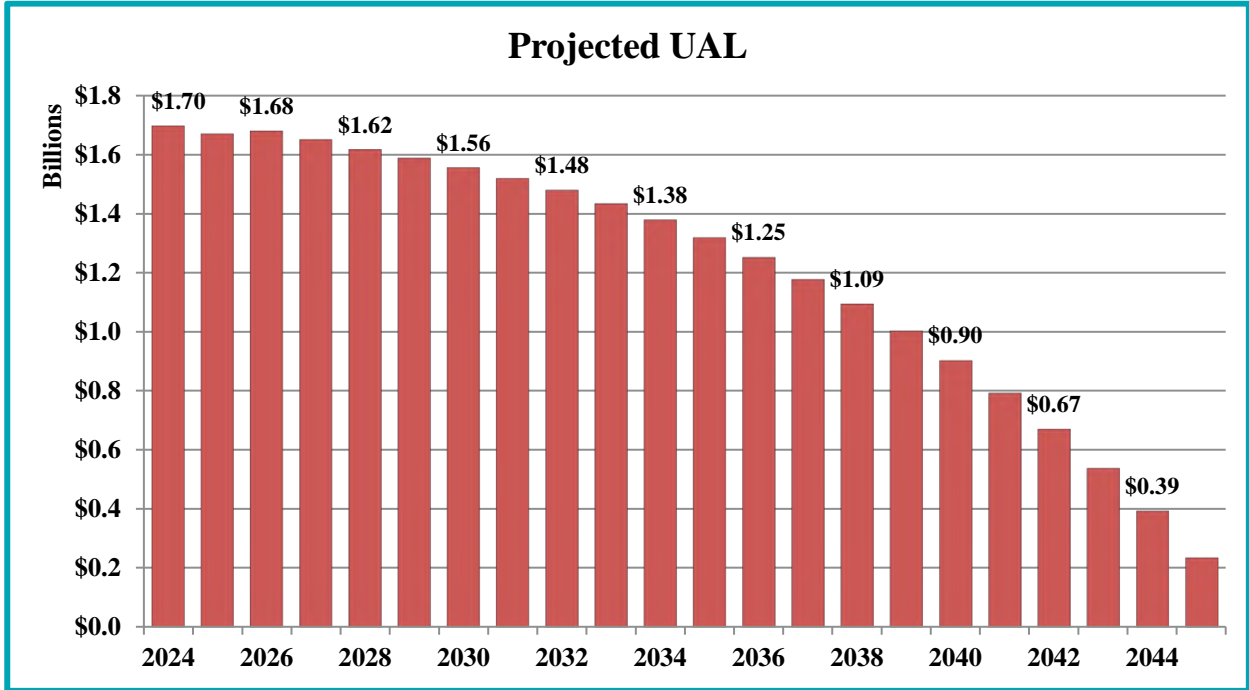
Source: Cheiron analysis of funding adequacy.

The System’s actuary commented that “the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution”. It isn’t clear what standard the System’s actuary is using to make this determination.

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The next chart shows that if the statutory contributions continue to be made each year and all other assumptions are met, the UAL is projected to decline from \$1.70 billion in 2024 to \$0.24 billion in 2045.



Source: Cheiron analysis of funding adequacy.

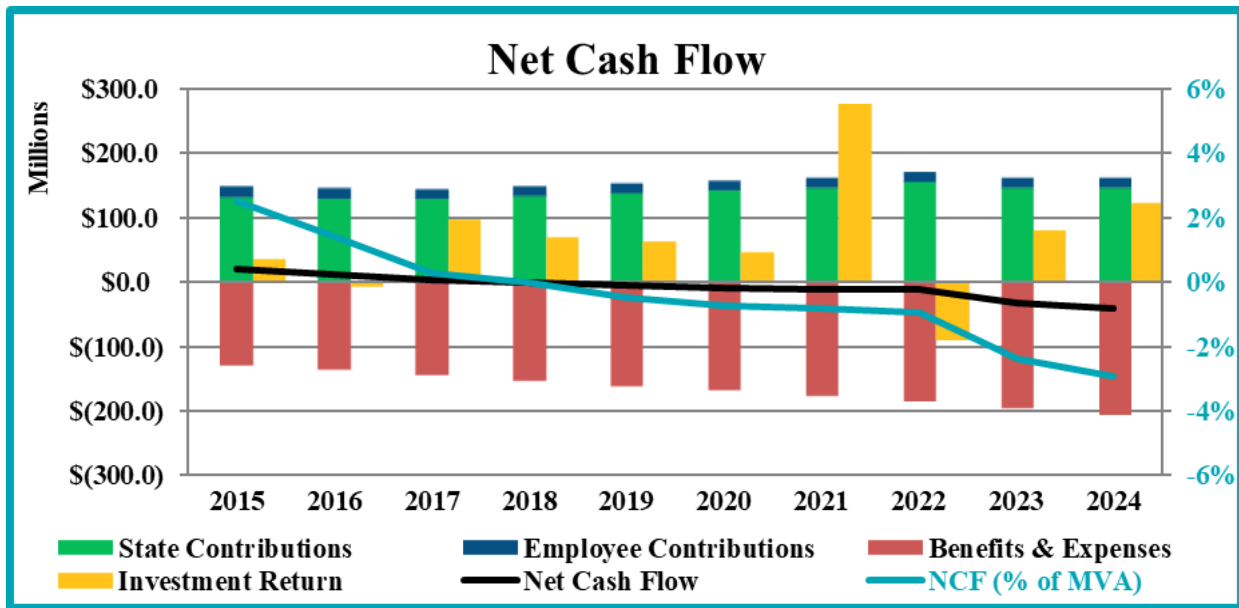
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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Net Cash Flow Analysis

The Plan's net cash flow is defined as State and Member contributions less benefit payments and administrative expenses. The more negative net cash flow is as a percentage of the plan's assets, the more vulnerable the Plan is to market downturns. When a pension plan has more payouts than contributions and suffers an investment loss, it is left with fewer assets to invest and recapture during a recovery.

Looking at the following chart, in the past JRS was neither mature nor immature on a net cash flow basis (black line), as the net cash flow was close to zero relative to the size of the System's assets. However, the System experienced an increase in negative cash flow over the last two years. This measure should continue to be monitored as negative cash flow increases the System's vulnerability to market downturns. The teal line shows net cash flow as a percent of Market Value of Assets on the right-side axis.



Source: Cheiron analysis of funding adequacy.

GRS's graph of cash flows on page 10 of the draft June 30, 2024 Actuarial Valuation shows that benefit payments and expenses in the years 2032 to 2037 are expected to come close to exceeding contributions and investment income at 6.50%. This should be monitored closely as assets can deteriorate quickly if investments earn less than what is assumed.

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

Response to Recommendations in 2023

In the State Actuary’s Preliminary Report on the Judges’ Retirement System of Illinois dated December 18, 2023, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in either the System’s comments last year, last year’s final June 30, 2023 Actuarial Valuation, or in this year’s draft June 30, 2024 Actuarial Valuation.

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.	Not Implemented	<p>The System has adopted a funding policy that would provide for annual State contributions, the Actuarially Determined Contribution; however, the actual funding of the System is based on State statute and a change in the funding method and funding policy would require a statutory change.</p> <p>GRS continues to include strong language throughout their report recommending the use of an actuarially sound method and stating clearly that the statutory method is not actuarially sound. We find these statements to be appropriate and support their continuation.</p> <p>Recommendation repeated.</p>
2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.	Not Implemented	<p>This period is determined by Public Act 100-0023 and would require a statutory change.</p> <p>Recommendation repeated.</p>
3. Section 3.2 of ASOP 51 requires the actuary to identify risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” [emphasis added]. The risks currently identified appear to largely duplicate the list of	Implemented	<p>In GRS’ letter regarding stress testing dated December 19, 2023, they identify the risks that may significantly affect the plan and explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition.</p>

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STATUS OF RECOMMENDATIONS FROM THE 2022 STATE ACTUARY REPORT

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
examples in ASOP 51 and could apply to almost any pension plan. For the 2023 valuation, we recommend that the actuary explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition.		Recommendation removed.
4. For each risk identified above, Section 3.3 of ASOP 51 requires the actuary to provide an assessment that takes into account “circumstances specific to the plan.” For some of the identified risks, the actuary has provided a quantitative assessment specific to the plan while for other identified risks, the actuary has only provided a generic statement that could apply to any plan. We recommend that for each identified risk the actuary provide an assessment, preferably quantitative, that considers the specific circumstances of this plan.	Implemented	In GRS’ letter regarding stress testing dated December 19, 2023, they provide an assessment that takes into account “circumstances specific to the plan” and provide quantitative assessment specific to the plan. Recommendation removed.
5. We recommend the JRS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.	Implemented	GRS has continued to do this, most recently providing a review in the <i>Economic Assumption Update Review</i> dated July 3, 2024. We will continue to include this recommendation each year. Recommendation continued.

Chapter Five

Preliminary Report on the General Assembly Retirement System

In accordance with 30 ILCS 5/2-8.1, Cheiron, the State Actuary, submitted a preliminary report to the Board of Trustees of the General Assembly Retirement

OVERVIEW GENERAL ASSEMBLY RETIREMENT SYSTEM as of June 30, 2024

Actuarial accrued liability	\$366,308,306
Actuarial value of assets	\$90,678,750
Unfunded liability	\$275,629,556
Funded ratio	24.8%
Employer normal cost	\$1,923,435
State contribution (FY26)	\$26,501,000
Active members	128
Inactive members	60
Current benefit recipients	438
Total membership	626
Interest rate assumption	6.50%
Inflation assumption	2.25%
Actuarial cost method	Projected Unit Credit
Asset valuation method	5-year Smoothing
Executive Director	Tim Blair
Actuarial Firm	Gabriel, Roeder, Smith & Company
Source: June 30, 2024 GARS actuarial valuation report.	

System (GARS) concerning proposed certifications of required State contributions submitted to Cheiron by the Board. The preliminary report was submitted to GARS on November 26, 2024. The preliminary report was based on Cheiron's review of actuarial assumptions included in GARS' 2024 Actuarial Valuation Report.

Following is Cheiron's final preliminary report on the General Assembly Retirement System. GARS' written response, provided on December 10, 2024, can be found in Appendix D.

December 13, 2024

Mr. Frank Mautino
Auditor General
400 W. Monroe Street
Springfield, Illinois 62704

Board of Trustees
General Assembly Retirement System of Illinois
2101 South Veterans Parkway
P.O. Box 19255
Springfield, Illinois 62794-9255

Dear Trustees and Auditor General:

In accordance with the Illinois State Auditing Act (30 ILCS 5/2-8.1), Cheiron is submitting this preliminary report concerning the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contribution to the General Assembly Retirement System of Illinois (GARS or System) for Fiscal Year 2026.

In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law. We note that the history of inadequate funding has resulted in current and future contribution levels, measured as a percentage of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings and recommendations. Section III provides the supporting analysis for those findings and presents more details on our assessment of the actuarial assumptions and methods employed in GRS's Actuarial Certification, as well as our assessment of GRS's determination of the required State contribution for Fiscal Year 2026. Section III also includes comments on other issues impacting the funding of the General Assembly Retirement System, including the implications of Article 2 of the Illinois Pension Code, which establishes the statutory minimum funding requirements for the System. Section IV reviews the projections contained in the draft June 30, 2024 Actuarial Valuation. Finally, Section V provides an analysis of funding adequacy.

In preparing this report, we relied on information (some oral and some written) supplied by GARS and GRS. This information includes actuarial assumptions and methods adopted by the GARS Board, System provisions, the draft June 30, 2024 Actuarial Valuation, the draft 2024 GASB 67/68 Report, the 2024 Actuarial Results presentation, the 2021 Actuarial Experience Study, the 2024 Economic Assumption Update Review, the actuarial audit of the June 30, 2020 actuarial valuation,

and minutes of the plan year 2024 GARS Board of Trustee meetings. A detailed description of all information provided for this review is contained in the body of our report as Appendix B.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Office of the Auditor General and the General Assembly Retirement System of Illinois for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron

SIGNED ORIGINAL ON FILE

Gene Kalwarski, FSA, EA, MAAA, FCA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Gregory A. Reardon, FSA, EA, MAAA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Jana R. Bowers, FSA, EA, MAAA
Associate Actuary

**THE STATE ACTUARY’S PRELIMINARY REPORT ON THE
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SECTION I – REPORT SCOPE

Illinois Public Act 097-0694 (the Act) amended the Illinois State Auditing Act (30 ILCS 5/2-8.1) and requires Cheiron, as the State Actuary, to review the actuarial assumptions and valuation of the General Assembly Retirement System of Illinois (GARS or System) and to issue to the GARS Board this preliminary report on the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contributions for Fiscal Year (FY) 2026. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the GARS Board to consider before finalizing its certification of the required State contributions for FY 2026.

While the Act states that just the actuarial assumptions and valuation are to be reviewed, we have also reviewed the actuarial methodologies (funding and asset smoothing methods) employed in preparing the Actuarial Certification, as these methods can have a material effect on the amount of the State contribution being certified. Finally, we have offered our opinion on the implications of Article 2-124 of the Illinois Pension Code, which impacts the contribution amount certified by GRS.

In conducting this review, Cheiron reviewed the draft June 30, 2024 Actuarial Valuation, the draft 2024 GASB 67/68 Report, the 2024 Actuarial Results presentation, the 2021 Actuarial Experience Study, the 2024 Economic Assumption Update Review, the actuarial audit of the June 30, 2020 actuarial valuation, and minutes of the plan year 2024 GARS Board of Trustee meetings. The materials we reviewed are listed in Appendix B.

In addition to reviewing the Actuarial Certification of the required State contribution to GARS, the Act requires the State Actuary to conduct a review of the “actuarial practices” of the Board. While the term “actuarial practices” was not defined in the Act, we continue to interpret this language to mean that we review: (1) the use of a qualified actuary (as defined by the Qualification Standards of the American Academy of Actuaries) to prepare the annual actuarial valuation for determining the required State contribution; and (2) the conduct of periodic formal experience studies to justify the assumptions used in the actuarial valuation. In addition, we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2024 Actuarial Valuation.

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SECTION II – SUMMARY OF RECOMMENDATIONS

This section summarizes recommendations from our review of the actuarial assumptions and methods employed in the draft June 30, 2024 Actuarial Valuation of GARS, as well as the “actuarial practices” of the GARS Board. Section III of this report contains detailed analysis and rationale for these recommendations.

Proposed Certification of the Required State Contribution

Gabriel, Roeder, Smith & Company (GRS) has determined that the FY 2026 required State contribution calculated under the current statutory funding requirements is \$26,501,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and have reviewed the assumptions on which it was based. We have accepted GRS’s 2024 Actuarial Liability as well as the annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions.

State Mandated Funding Method

1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State’s funding policy to require that the contribution impact of all assumption changes be phased-in over a five-year period.

2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing this phase-in period is under the jurisdiction of State law and not the Retirement System.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

30 ILCS 5/2-8.1 requires the State Actuary to identify recommended changes in actuarial assumptions that the GARS Board must consider before finalizing its certification of the required State contribution. We have reviewed all the actuarial assumptions used in the draft June 30, 2024 Actuarial Valuation and conclude that the assumptions are reasonable in general, based on the evidence provided to us.

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SECTION II – SUMMARY OF RECOMMENDATIONS

Recommended Changes for Future Valuations

3. We recommend the GARS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.
4. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.
5. We recommend GRS include annual opt-out data in the Active Membership table shown on page 11 of the Actuarial Valuation.

GASB 67 and 68

The 2024 GARS GASB 67 and 68 information was provided in a separate report. We find that the assumptions and methods used to prepare the 2024 GARS GASB 67 and 68 schedules are reasonable based on the evidence provided to us.

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SECTION III – SUPPORTING ANALYSIS

In this section we provide detailed analysis and supporting rationale for the recommendations that were presented in Section II of this report.

Proposed Certification of the Required State Contribution

As stated in our summary of recommendations in Section II, we have verified the arithmetic calculations made by GRS to develop the required State contribution, reviewed the assumptions on which it is based, and accepted GRS’s 2024 Actuarial Liability as well as the annual projections of future payroll, total normal costs, benefits, expenses, and total contributions. However, in accordance with 30 ILCS 5/2-8.1, our review does not include a replication of the actuarial valuation results.

State Mandated Methods

The Illinois Pension Code (40 ILCS 5/2-124) establishes a method that does not fully fund the System. This law requires the actuary to calculate the employer contribution as the level percentage of projected payroll that would accumulate assets equal to 90% of the Actuarial Accrued Liability in the year 2045 if all assumptions are met. This contribution methodology does not conform to generally accepted actuarial principles and practices. Generally accepted actuarial funding methods target the accumulation of assets equal to 100% of the Actuarial Accrued Liability, not 90%.

We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully fund plan benefits within a reasonable period. (Recommendation #1).

The State Mandated Method is entering a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the Plan is ultimately 100% funded within a reasonable period.

The State Mandated Contribution for FY 2026 is sufficient to pay the employer normal cost, administrative expenses, and an amortization payment on the UAL that, if based on flat payroll, would be expected to pay off the UAL in 18.3 years. According to “Actuarial Funding Policies and Practices for Public Plans” published by the Conference of Consulting Actuaries, an amortization period of 25 years or less is considered an “Acceptable Practice, with Conditions” where the conditions primarily relate to the amortization of plan amendments. Consequently, the current contribution amount may be considered reasonable even though the methodology is not reasonable because it does not accumulate assets equal to 100% of the Actuarial Accrued Liability.

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SECTION III – SUPPORTING ANALYSIS

The State Mandated Method will produce increasingly volatile contribution levels as the remaining period to achieve 90% funding shortens. Consequently, when changing to a reasonable ADC, as described above, consideration should be given to a method, such as layered amortization, that produces more stable contribution requirements.

The GRS draft June 30, 2024 Actuarial Valuation includes a calculation of a funding policy based on GASB 25 and 27 expense requirements which would contribute the normal cost plus an amortization payment that would seek to fully pay off the total Unfunded Actuarial Liability over a closed period of not more than 30 years. The GARS Board of Trustees has adopted a separate funding policy to calculate an *Actuarially Determined Contribution (ADC)*. The funding policy calls for a funding amount equal to the normal cost plus a closed 20-year amortization as a level percentage of capped payroll, as of June 30, 2015, of the Unfunded Actuarial Liability. As of June 30, 2024, the remaining amortization period is 11 years. This policy defines a method that would ultimately fully fund the Plan and falls within generally accepted actuarial funding methods currently in use for public plans. According to this methodology, the State's contribution amount would be \$37,062,736 for FY 2026 compared to the statutory contribution amount of \$26,501,000. It is important though to recognize that this policy does not affect the actual funding of the System.

We have reviewed the adopted policy. We note that this policy meets the requirements of a Reasonable Actuarially Determined Contribution and satisfies the ASOP 4 requirement to calculate and disclose a Reasonable Actuarially Determined Contribution (ADC). We also agree with its use in the GASB report as an ADC. Finally, while this method is an improvement to the State Mandated Funding Method, it would produce increasingly unstable contributions as 2035 approaches due to the method being a closed period amortization.

Recognition of Changes in Actuarial Assumptions

Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State's funding policy to require that the contribution impact of all assumption changes, including changes prior to P.A. 100-0023, be phased-in over a five-year period. As such, the Act delays the recognition of the impact of assumption changes when calculating the contribution requirement of the System. Assumption changes are intended to more accurately anticipate the obligations for funding based on the most recent experience analysis and forward-looking changes to future investment returns. However, only one-fifth of the impact of these changes are now recognized from the date of adoption. The remainder of the impact is recognized over four additional years such that the full impact is only recognized at the end of a five-year period beginning at the date of adoption. This phase-in provides time to adjust to a new level of contributions. However, the Conference of Consulting Actuaries White Paper on Actuarial Funding Policies and Practices for Public Pension Plans recommends that the "phase-in period should be no longer than the time period until the next review of assumptions." **Because experience studies are performed every three years, we recommend the phase-in period for the impact of assumption changes be reduced to no longer than three years (Recommendation #2).**

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SECTION III – SUPPORTING ANALYSIS

Stress Testing

We anticipate GRS will continue including stress testing of the System within the valuation report and include an explanation of the implications that volatile investment returns and a variety of other stressors (e.g., lower salary growth, assumption changes) can have on future State costs. The tests illustrate the potential stresses on the System and its contributing sponsors so that an assessment of sustainability can be made.

We note that GRS has included stress testing in the final report for the last several years, but the stress testing section has not been completed in this year’s draft report. Last year, a separate letter dated December 18, 2023 was subsequently provided that contained the stress testing that was ultimately included in the final report. We anticipate that similar stress testing will be included in the final June 30, 2024 Actuarial Valuation.

Actuarial Standard of Practice 51

Actuarial Standard of Practice (ASOP) 51 provides guidance to actuaries on the assessment and disclosure of risks to help readers of the actuarial valuation report “*understand the effects of future experience differing from the assumptions used*” and “*the potential volatility of future measurements resulting from such differences*”.

ASOP 51’s first requirement is to “*identify risks that, in the actuary’s professional judgment, may reasonably be anticipated to significantly affect the plan’s future financial condition.*” GRS lists six example sources of risk to GARS on page 13 of the draft report: investment risk, asset/liability mismatch risk, contribution risk, salary and payroll risk, longevity risk and other demographic risks. GRS notes that Section J of the report identifies and discusses key risks facing the System. This section is not included in the draft June 30, 2024 Actuarial Valuation, however the section was included in the final June 30, 2023 Actuarial Valuation.

ASOP 51 requires the actuary to assess each of the risks identified. While the assessment does not have to be quantitative, it does have to take into account the specifics of the individual plan. The following risks were identified in the final June 30, 2023 Actuarial Valuation.

- Investment Risk. GRS included additional stress testing in last year’s final actuarial valuation report that adequately assessed the investment risk with various investment return scenarios.
- Assumption Change Risk. GRS assessed the impact of a change to the discount rate assumption in Section J by projecting the impact of a change to 6.00%. If other assumption changes, like updates to mortality or retirement rates, are viewed as significant GRS may want to assess them in future valuations
- Contribution Risk. GRS discusses several issues with the statutorily required contribution amounts in the risk section as well as in other parts of the valuation report. The stress testing

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included in last year’s final actuarial valuation report assessed the impact changing the contribution requirement to fund to 100% in 2045.

- Demographic Risks. The stress testing included in last year’s final actuarial valuation report adequately assessed the salary and payroll risk by modeling alternative opt-out scenarios.

ASOP 51 requires the actuary to recommend a more detailed assessment of risks if it “*would be significantly beneficial.*” GRS adequately identified the primary drivers of these risks, provided background information and assessments about these identified risks. The stress testing included in last year’s final actuarial valuation report provided a quantitative assessment of the investment risk, assumption change risk, contribution risk, and salary and payroll risk and we anticipate similar stress testing will be included in this year’s actuarial valuation report. However, the example risks noted on page 13 of the draft June 30, 2024 Actuarial Valuation were only qualitatively described in a manner that could apply to any pension plan.

Section 3.2 of ASOP 51 requires the actuary to identify risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” In the draft June 30, 2024 Actuarial Valuation, the risks that are significant to the system are not identified though it is noted they will be identified in Section J of the final report. In the final June 30, 2023 Actuarial Valuation, GRS included a letter regarding stress testing that identified the risks that may significantly affect the plan and explained how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition. We anticipate similar identification and explanation will be included in the final 2024 valuation.

Actuarial Standard of Practice 4

Actuarial Standard of Practice No. 4 (ASOP 4) was amended and the changes first became effective for GARS’ actuarial valuations starting June 30, 2023. The revised ASOP added three requirements for actuarial valuation reports.

Calculate and disclose a Reasonable Actuarially Determined Contribution

GRS does calculate and disclose the funding policy contribution set forth by the Board. We note that this policy meets the requirements of a Reasonable Actuarially Determined Contribution and satisfies the ASOP 4 requirement to calculate and disclose a Reasonable Actuarially Determined Contribution (ADC).

Implications of the Funding Policy

In the draft June 30, 2024 Actuarial Valuation Report GRS includes disclosures of the implications of the State Mandated Funding Policy:

1. A qualitative assessment that contributions beginning in 2033 through 2045 are expected to be flat as a percentage of total payroll,

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2. The unfunded liability is expected to decrease in dollar amount through 2045,
3. A statement that the Unfunded Actuarial Liability is never expected to be paid off, and
4. The funded ratio is expected to increase to 90% in 2045.

Calculation and Disclosure of Low Default Risk Obligation Measure (LDROM)

The draft June 30, 2024 Actuarial Valuation includes a description and calculation of LDROM. This includes an explanation of the discount rate curve, cost method, and assumptions used to calculate LDROM. GRS has also included a comparison of the LDROM to the Accrued Liability and commentary explaining the significance of the LDROM as required by ASOP 4 “with respect to the funded status of the plan, plan contributions, and the security of participant benefits.”

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Assessment of Actuarial Assumptions Used in the 2024 Valuation

A. Economic Assumptions

The economic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Experience Review Report dated April 14, 2022, and the Economic Assumption Update Review dated May 1, 2024, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. Interest Rate

The interest rate assumption (also called the investment return or discount rate) is the most impactful assumption affecting the required State contribution amount. This assumption, which is used to value liabilities for funding purposes, was maintained at 6.50% for the draft June 30, 2024 Actuarial Valuation.

After reviewing all the materials (see Appendix B of this report) that were made available, Cheiron concludes that the interest rate of 6.50% for this valuation is reasonable.

We recommend the GARS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly (Recommendation #3).

The items we considered and our rationale for this recommendation are as follows:

- A review of the interest and inflation rates does not involve the collection of significant data and can be updated annually. In addition, it keeps the Board focused more closely on these critical assumptions.
- In GRS's May 1, 2024 Economic Assumption Update Review, they presented the opinions of eight independent investment consulting firms on the future long-term (20 to 30 year outlook) expected earnings of the System and concluded that, the long-term expected geometric mean of the GARS portfolio is 7.09% (See Exhibit C of the 2024 Economic Assumption Update Review, which was reproduced below for ease of reference). They also presented the distribution of the 20-year average geometric net nominal return for these eight independent consulting firms. This showed that GARS has a 58.38% chance of exceeding the 6.50% assumption (see the fifth column, bottom row in Exhibit C).

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In addition, GRS in that same review presented a 10-year outlook based on 12 independent investment consulting firm’s capital market assumptions which produced a 6.87% expected geometric mean with a 53.89% chance of exceeding the 6.50% assumption.

Distribution of Long-Term Average Geometric Net Nominal Return

Investment Consultant	Distribution of 20 to 30-Year Average Geometric Net Nominal Return			Probability of exceeding 6.50%
	40 th	50 th	60 th	
(1)	(2)	(3)	(4)	(5)
1	5.34%	5.98%	6.61%	41.72%
2	6.13%	6.84%	7.55%	54.78%
3	6.25%	6.95%	7.65%	56.40%
4	6.59%	7.24%	7.89%	61.40%
5	6.58%	7.27%	7.97%	61.13%
6	6.58%	7.34%	8.10%	61.02%
7	6.76%	7.45%	8.15%	63.71%
8	7.00%	7.69%	8.39%	66.86%
Average	6.40%	7.09%	7.79%	58.38%

In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received (Recommendation #4).

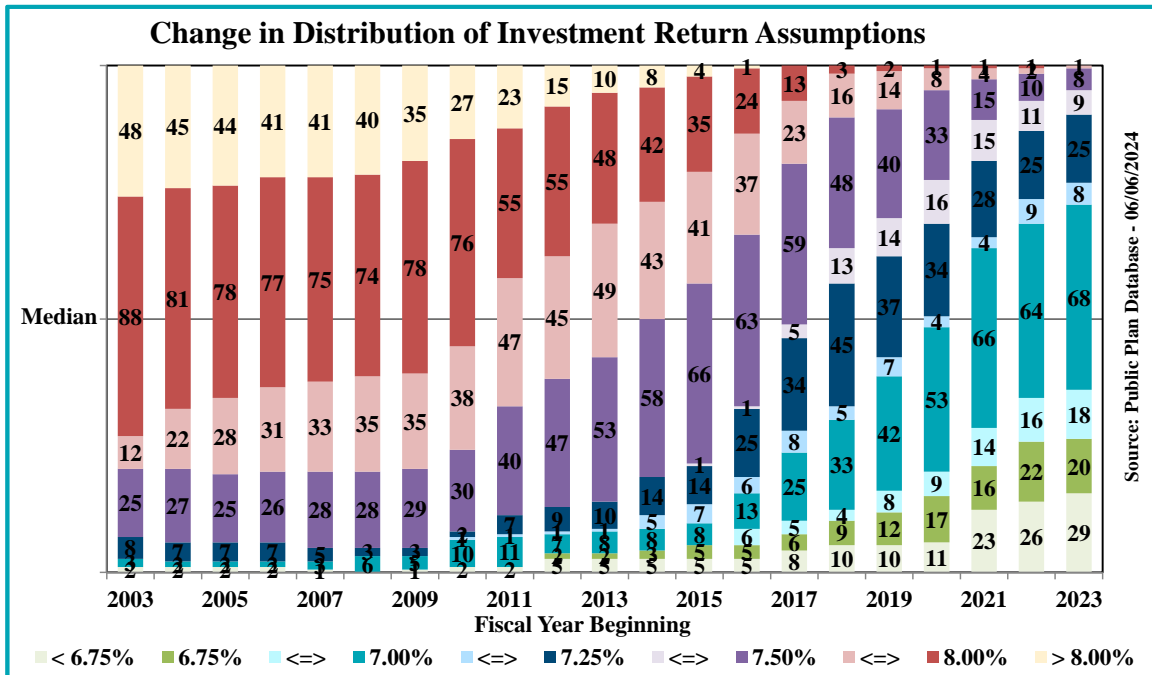
Disclosing the names of the investment consulting firms that participated in the survey will provide added transparency and the ability to review how each firm’s expectations have changed year to year. Market expectations can quickly change to reflect new information, trends and updated outlooks. Thus, knowing when the capital market assumptions were effective is also important.

- GRS’s May 1, 2024 Economic Assumption Update Review also presented the expectations of the Illinois State Board of Investment’s investment consultant Meketa Investment Group. After adjusting for GRS’s assumed rate of inflation, Meketa’s expected 20-year geometric average return of the GARS portfolio is 7.69% (See Exhibit A of the GRS 2024 Economic Assumption Update Review). Based on the capital market assumptions provided by Meketa, GARS has a 66.86% chance of exceeding the assumption of 6.50%. Given that GARS is only 24.65% funded on a market asset value, an expectation of achieving the investment return over 65% of the time could result in cost decreases following years that the returns are above the assumption.

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- The combination of the expectations from the Illinois State Board of Investment’s investment consultant and the expectations from a variety of independent investment consulting firms supports the reasonableness of assuming a 6.50% interest rate for the current year. It is prudent not to react to the recent uptick in expected returns until long-term trends are established.
- While the discount rate assumption should be based on the future expected investment returns for the System’s investment portfolio, survey information can provide an important context for evaluating the assumption. The Public Plans Database is maintained by a partnership between the Center for State and Local Government Excellence (SLGE) and the Center for Retirement Research at Boston College with support from the National Association of State Retirement Administrators (NASRA). This database contains historical information on large public pension plans, including key assumptions used in their actuarial valuations. The following chart shows the distribution of investment return assumptions for the 186 plans in the Public Plans Database with consistent information from 2003 through 2023 as of June 6, 2024.



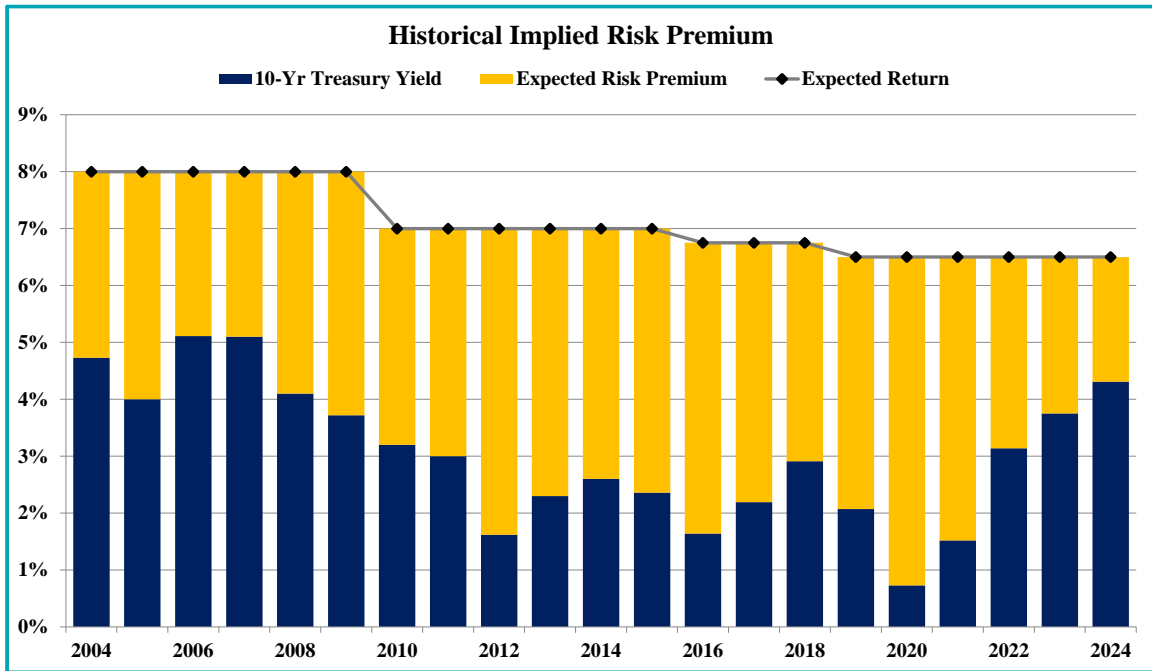
Over the period shown, there continues to be a pattern of reducing discount rates partially reflecting long-term changes in capital markets, interest rates and underlying inflation. Of the 186 plans shown, 128 have reduced their discount rate assumption since 2019. For these plans, the average reduction is 0.39%.

- Over the last two decades, declining interest rates have forced pension plans to either reduce their discount rates, increase their exposure to investment risk, or some

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combination of the two. For example, as shown in the chart below, in June 2006, the yield on 10-year Treasury bonds (a proxy for risk-free investments) reached a high in the 20-year period of 5.1%. To achieve GARS' then assumed return of 8.0%, the System's investments had to outperform the yield on the 10-year Treasury by 2.9%. In June 2020, the yield on the 10-year Treasury had dropped to 0.7%, and to achieve GARS' assumed return of 6.50%, the System's investments needed to exceed the 10-year Treasury yield by 5.8%. Even though GARS had reduced its return assumption by 150 basis points over the period, it still had to take more investment risk in 2020 to meet its assumption than it did in 2006. Since 2020, yields on 10-year Treasury bonds have increased, reducing the expected risk premium needed to achieve the System's assumed return. Yields on 10-year Treasury bonds have been approximately 4% during 2024; therefore, the System's investments currently only need to exceed the 10-year Treasury yield by about 2.50% to achieve the 6.50% assumed return, which is the lowest expected risk premium over the last 20 years. If these higher Treasury bond yields persist, plans may be able to achieve the expected return with less exposure to investment risk. However, if these higher Treasury bond yields prove temporary, plans could quickly find the pressure returning to further reduce discount rates or increase their exposure to investment risk.



- GARS experienced positive cash flow (contribution income greater than benefits and expense payouts) from FY 2020 through FY 2023 however currently the plan has negative cash flow for FY 2024 equal to 0.57% of assets, and this trend is expected to continue through FY 2041 as shown in the graph on page 10 of the draft 2024 Actuarial Valuation. When short-term returns are expected to be lower than the long-term

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expectations, which is the current case with GARS, a plan with negative cash flows will have actuarial returns (i.e., dollar-weighted returns) that are less than their “time-weighted” returns.

2. Inflation Assumption

As recommended in the GRS May 1, 2024 Economic Assumption Update Review, the inflation assumption of 2.25% was maintained for the draft June 30, 2024 Actuarial Valuation.

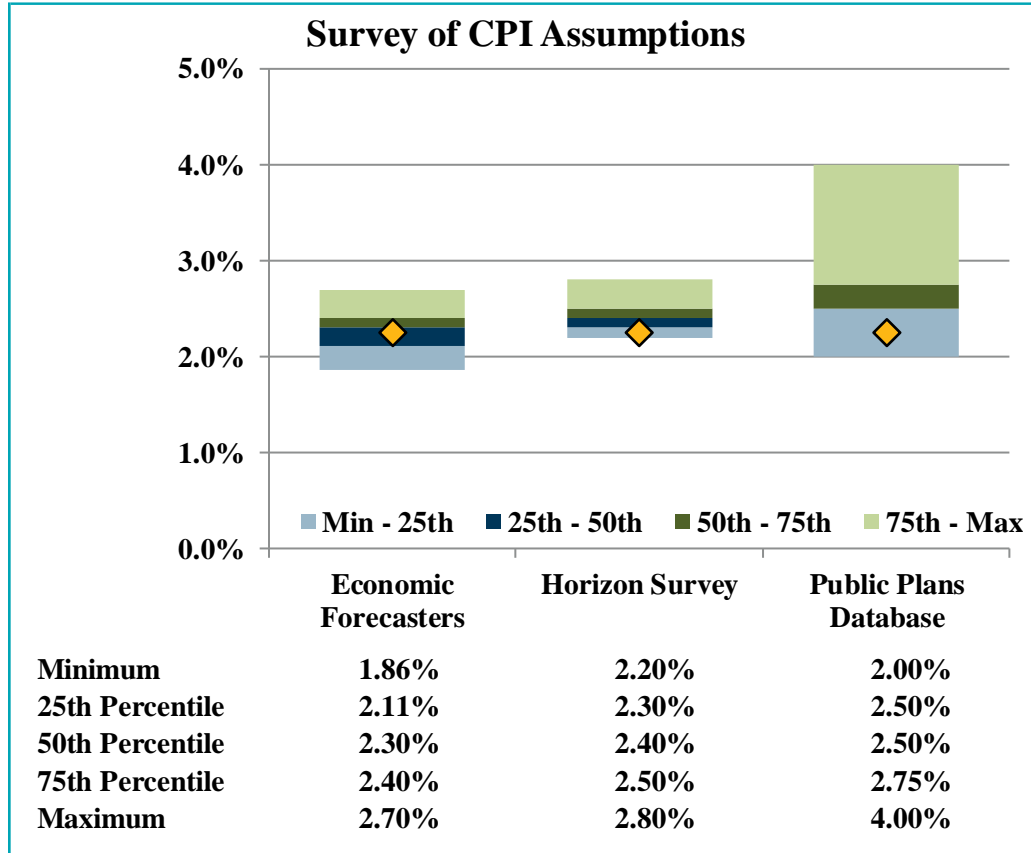
We find the 2.25% inflation assumption to be reasonable.

Our rationale for concurring with the 2.25% assumption:

- GRS’s May 1, 2024 Economic Assumption Update Review included a survey of the inflation assumptions of independent investment consulting firms. The eight investment consulting firms with longer time horizons (20+ years) reported an average inflation assumption of 2.53% and ranged from 2.20% to 2.84%. The twelve firms with a shorter time horizon reported an average inflation assumption of 2.39% and ranged from 2.13% to 2.70%. **As mentioned earlier, in future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received (Recommendation #4).**
- GRS’s May 1, 2024 Economic Assumption Update Review also included the forward-looking inflation forecasts from the Federal Reserve Bank of Cleveland as of April 1, 2024. This forecast shows inflation over the next 10 years of 2.34% increasing to 2.45% over 30 years.
- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), inflation will average between 1.8% and 3.0% (<http://www.ssa.gov/oact/tr/2024/tr2024.pdf>). Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.4%.
- The following chart shows the distribution of inflation expectations for the Third Quarter 2024 survey of professional economic forecasters published by the Philadelphia Federal Reserve, the 2024 Horizon survey of investment consultant capital market assumptions (20-year), and the 2023 inflation assumptions used by plans in the Public Plans Database compared to the GARS assumption (indicated by the gold diamonds). The assumption of 2.25% is in the second quartile of the range projected by professional economic forecasters and the lowest quartile of the range projected by investment consultants and of the range used by other public pension plans.

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3. *Salary (Annual Compensation) Increase Assumption*

The salary increase assumption for uncapped payroll is 2.50% per year, compounded annually for all Tier 1 active members, regardless of age or service. It includes components of 2.25% per annum for inflation and 0.25% per annum for productivity. The salary increase assumption for capped payroll is 2.25% per year, compounded annually for all Tier 2 active members, regardless of age or service.

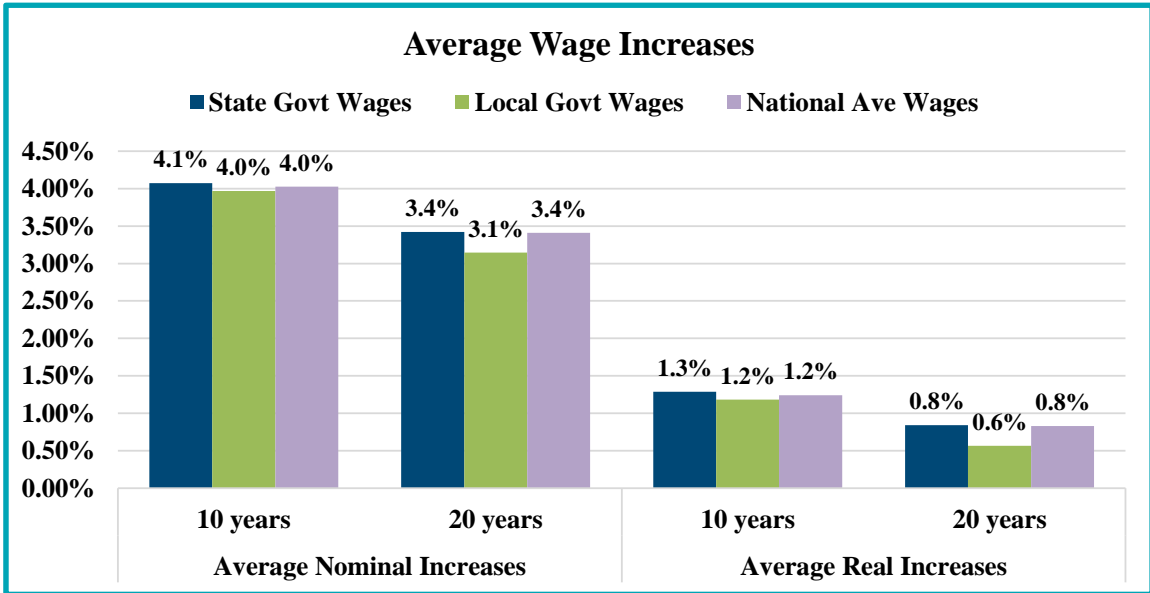
We find the assumption and the basis for setting the assumption reasonable and consistent with the inflation assumption.

Our rationale for concurring with GRS's recommended salary increase assumption:

- The following chart shows the average nominal and real increases in wages over the last 10 and 20 years for State governments, local governments, and National Average Wages. State and local government data is from the Quarterly Census of Employment and Wages as published by the Bureau of Labor Statistics. National Average Wages is published by the Social Security Administration.

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- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), real wage differential will average somewhere between 0.53% and 1.74%. Under the intermediate cost projection, the Social Security Administration uses an assumption of 1.14%.
- Although salary increases were higher than assumed in the most recent year, this assumption is a long-term assumption and we believe the 2.50% and 2.25% salary increase assumption for Tier 1 and Tier 2 active members, respectively, are reasonable.

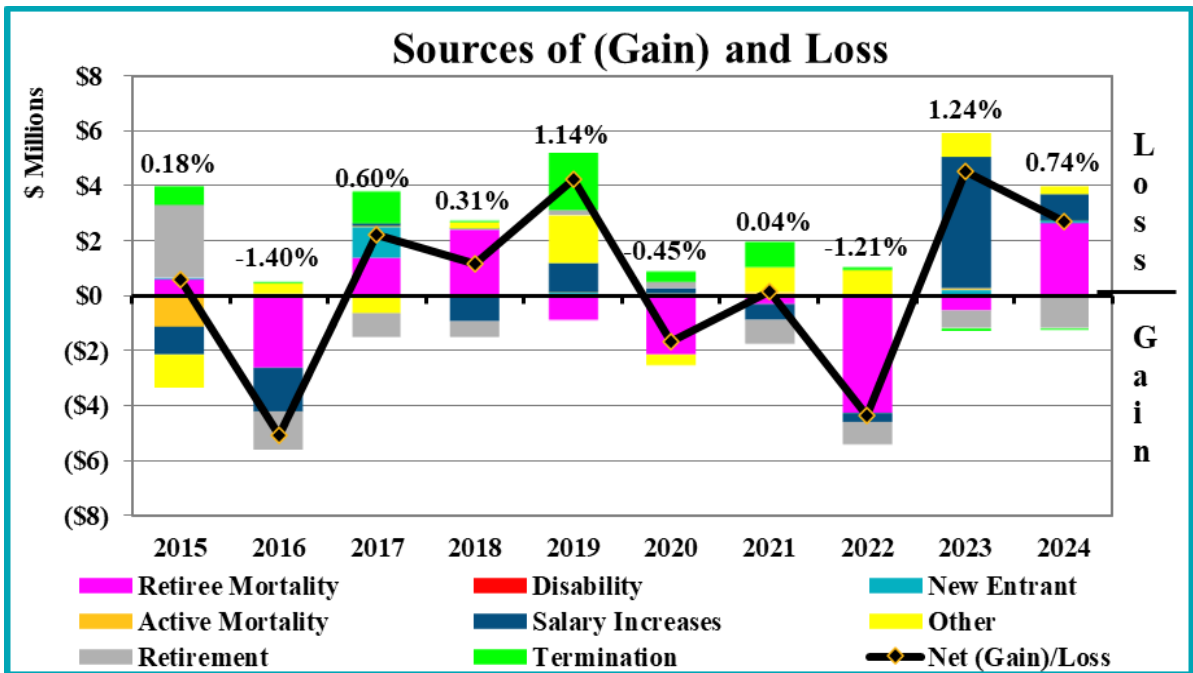
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B. Demographic Assumptions

In its annual actuarial valuation reports, GRS regularly reports sources of liability gains and losses. In the draft June 30, 2024 Actuarial Valuation, these are shown on page 24. In the chart below, we have collected similar data from past valuation reports dating back to 2015 and use these to present a historical review of past demographic and salary increase experience gains and losses.

The following chart shows the pattern of annual gains and losses attributable to eight different sources as shown in the legend. When the colored bar slices appear above zero on the Y-axis, it represents an experience loss with the value representing the increase in liabilities over what was expected. When the bar slices are below zero, they represent experience gains with the values representing the reductions in the liabilities for that year versus what was expected. The net liability (gain)/loss is shown by the black line. This net (gain)/loss as a percent of liability for each year is shown as the percentage above the bars.



The percentages shown above the bars refer to net (gain)/loss as a percentage of liability.

Key observations from this chart are as follows:

1. Although GARS experienced eight consecutive liability losses from 2015-2022 due to assumed termination rates, the Plan experienced small gains due to the termination assumption the last two years suggesting the termination assumption, which was updated effective with the June 30, 2022 Actuarial Valuation, is currently reasonable.

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2. There have been retirement gains the last four years. The gains from retirement should continue to be monitored and the assumption may need to be revised if it continues to result in consistent gains.
3. Mortality experience has been volatile over the last several years. In years where there were losses, it means fewer deaths were observed than anticipated. Another way to express this is retirees are living longer than the current mortality assumption predicts. In contrast, in years where there were gains, it means there were more deaths than anticipated. For 2022, there is a sizable gain due to mortality experience which may be attributable to COVID. However, in 2024 there is a loss indicating retirees are living longer than expected.
4. While there have been both salary gains and losses, total payroll had decreased significantly due to the decline in the active membership. However, payroll grew about 20% during FY 2023 and the Plan experienced a large loss due to actual salary increases that were higher than expected. Payroll continued to increase in FY 2024 by about 8% and average uncapped salary increased 4.25%, resulting in a salary loss.

The demographic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Experience Review Report dated April 14, 2022, and we have concluded all continue to be reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. New Entrants

The new entrant profile includes uncapped and capped salary information. New entrants are assumed to enter with an average age of 41.65, average uncapped pay of \$103,658, and average capped pay of \$101,980. Based on the assumption that 45 percent of future members elect to opt-out of the pension system, the population is projected to decrease from 128 members as of the valuation date, to 76 members in 2045 and ultimately reach 71 members in 2056. The average increase in uncapped payroll for the projection period is 2.50% per annum.

The 2021 Actuarial Experience Study noted the 2021 opt-out experience was 40% which is in line with the current assumption of 45%. More historical experience would be helpful to compare the historical trend to the ongoing assumption. **In addition, we recommend GRS include annual opt-out data in the Active Membership table shown on page 11 of the Actuarial Valuation (Recommendation #5).**

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C. Funding Methods

Actuarial funding methods consist of three components: (1) the actuarial cost method, which is the attribution of total costs to past, current, and future years; (2) the asset valuation method (i.e., asset smoothing); and (3) the amortization method.

1. Actuarial Cost Method

The System uses the Projected Unit Credit cost method (PUC) to assign costs to years of service, as required under the Pension Code (40 ILCS 5/2). **We have no objections with respect to using the PUC method, although we would prefer the Entry Age Normal (EAN) cost method, as it is more consistent with the requirement in 40 ILCS 5/2-124 for level percentage of pay funding.**

Under the PUC method, which is used by some public sector pension funds, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the valuation date but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the Actuarial Liability for a given active participant. Under the PUC cost method, the value of an active participant's benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. While the PUC method is not an unreasonable method, as a result of this pattern of benefit values increasing, more plans use the EAN cost method to mitigate this effect. It should also be noted that the EAN cost method is the required method to calculate liability for GASB Nos 67 and 68.

2. Asset Valuation Method

The Actuarial Value of Assets for the System is a smoothed market value. Unanticipated changes in market value are recognized over five years in the Actuarial Value of Assets. The primary purpose for smoothing out gains and losses over multiple years is so fluctuations in the contributions will be less volatile over time than if based on the Market Value of Assets.

The 2024 Public Retirement Systems Study by the National Conference on Public Employee Retirement Systems (NCPERS) survey of 157 public retirement funds found that the majority of plans responding to the survey have a five-year smoothing period.

Smoothing the market gains and losses over a period of five years to determine the Actuarial Value of Assets is a generally accepted approach in determining actuarial cost, and we concur with its use.

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3. Amortization Method

The mandated State contribution is based on a determination of the level percentage of payroll that is expected to achieve a 90% funded ratio in 2045. While not a traditional amortization method, this methodology effectively amortizes a portion of the Unfunded Actuarial Liability over the remaining period until 2045, which is currently 21 years.

One of the principles of funding public plans identified by the American Academy of Actuaries is that there should be “a plan to make up for any variations in actual assets from the funding target within a defined and reasonable time period.” Because it only targets 90%, the State method does not include a plan to achieve the funding target over any period of time.

Finally, as the remaining period to achieve 90% funding shortens, the State mandated method will also produce more volatile contributions. Instead of a single fixed period, typical public plan amortization methods use layered amortization bases such that new assumption changes and experience gains and losses are amortized over a new period (e.g., 20 years) while the remaining period for the prior amortization layers becomes one year shorter.

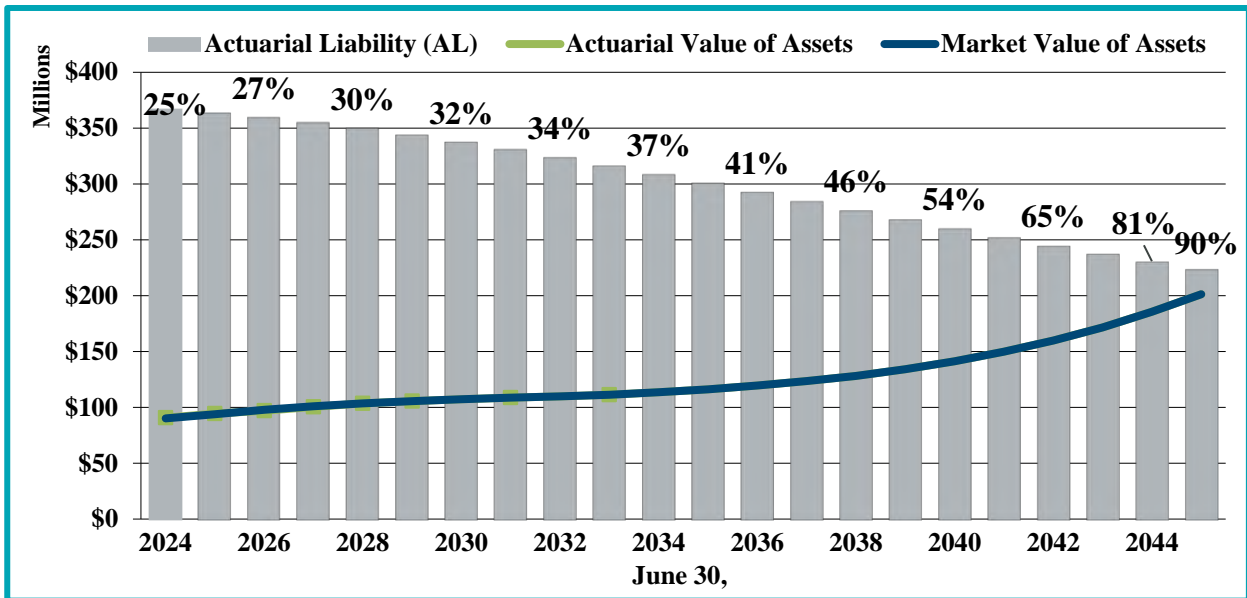
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SECTION IV– PROJECTION ANALYSIS

This section reviews the projections contained in the draft June 30, 2024 Actuarial Valuation of GARS. These projections are fundamental to the development of the required State contribution calculated under the current statutory funding requirement.

The following graphs are independent approximations of the projections performed by the State Actuary to verify that the System’s funding projections are reasonable. They do not reflect all the precision of the projections applied by the System’s actuary, but instead they are intended to verify the reasonableness of the modeling done by the System’s actuary.

The graph below shows our projection of the expected future liabilities and assets in the System through 2045. As pointed out on page 9 of the draft June 30, 2024 Actuarial Valuation, the majority of the funding of the System occurs in the later years of the projections. The **lines show the projected assets** (market value and actuarial value), and the **bars show the projected liabilities** of the System. The funded ratio for every other year is shown at the top of the graph. For example, in 2034, the funded ratio is projected to be approximately 37% with assets being approximately \$114 million and liabilities being approximately \$308 million.

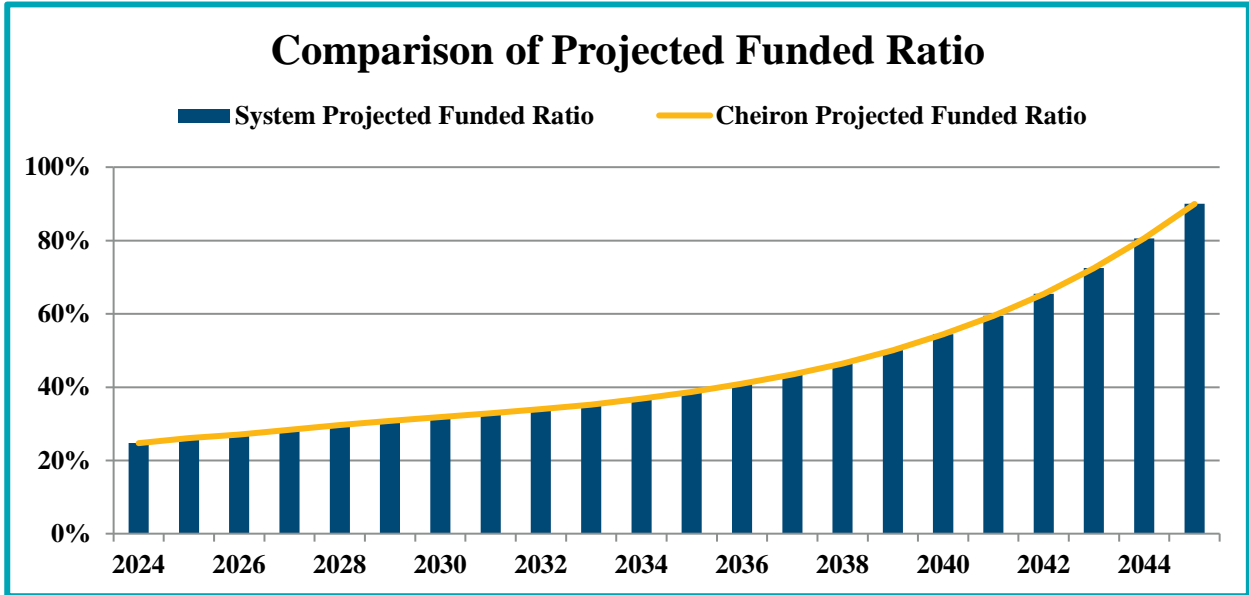


Source: Cheiron projection analysis.

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When we compare our projected funded ratio against the results shown in the draft June 30, 2024 Actuarial Valuation, **we find a close match in expected funded ratio.** This close match of the funded ratio supports that the projections done by the System's actuary are reasonable and the fact we show slightly different funded ratios is a function of Cheiron's approximation.

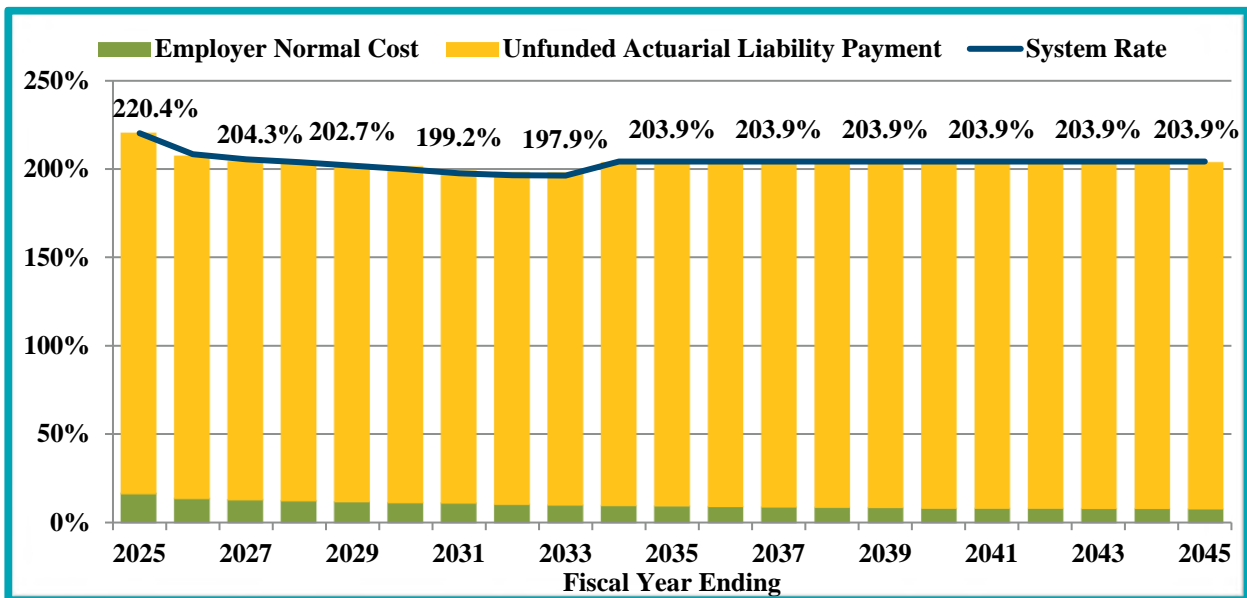


Source: Cheiron projection analysis.

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The following graph shows the expected contribution calculated under the statutory method. The contribution as a percentage of capped payroll for every other year is shown above the bar. The value shown for the fiscal year ending 2025 was set based on the June 30, 2023 Actuarial Valuation. The current valuation is the basis for setting the rates starting July 1, 2025 (Fiscal Year Ending June 30, 2026). The contribution requirement has two components: 1) the employer normal cost, which is the approximate value of the amount of benefits accrued by participants not covered by employee contributions based on the statutory funding method; and 2) an amortization of the unfunded liability. The normal cost amounts are shown by the green bars and the amortization of the Unfunded Actuarial Liability (UAL) amounts by the yellow bars. The percentages shown are the total contribution rates calculated by Cheiron, which are equal to the sum of the bars. The graph shows that a larger percentage of the total contribution is being made toward the UAL payment later in the period. The blue line shows the projected contribution rates as percentages of payroll from the draft June 30, 2024 Actuarial Valuation. The difference between Cheiron's approximation and the System's projections is the difference between the top of the bars and the line. The difference between the two calculations are insignificant. The contributions are being limited by the maximum contribution described in the General Obligation Bond Act prior to 2033, which is why the rate increases after 2033.



Source: Cheiron projection analysis.

Our conclusion is that **the projections performed by the System's actuary are reasonable.**

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

In this section, we examine the adequacy of the funding for the System, including funded ratio, the sources of changes in the Unfunded Actuarial Liability (UAL), and projections of the UAL and statutory funding requirements compared to contributions needed to pay down the UAL.

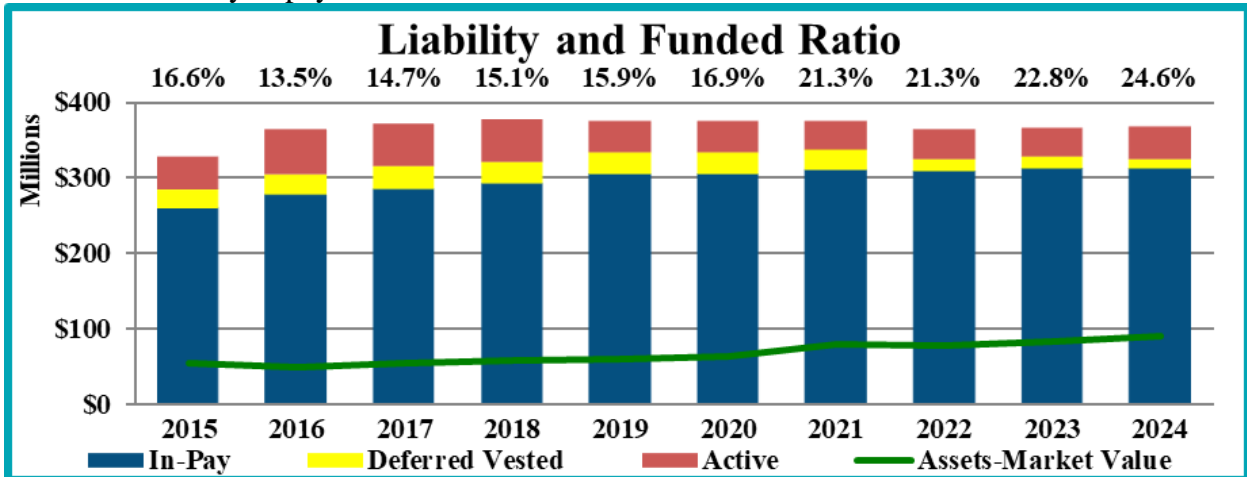
The actuarial valuation report prepared by GRS includes both traditional actuarial measurements, as well as additional risk measurements that are shown on pages 13 to 18 of the draft June 30, 2024 Actuarial Valuation report. GRS also identified and assessed risk measurements in Section J of their final 2023 Actuarial Valuation Report. Given the unique and substantial funding challenges faced by the Illinois pension systems, this additional information is quite important and supplements the information we present here on funding adequacy to better inform the legislature and other stakeholders about the adequacy of the System’s funding.

System Funded Ratio

The first funding adequacy measure is the historical trend of the System’s funded ratio for the past ten years. Funded ratio for this purpose is defined as the ratio of the Market Value of Assets to the Actuarial Liability. The chart below shows that GARS’ funded ratio has improved from 16.6% funded in 2015 to 24.6% funded in 2024, an increase in funded ratio of 8.0%. In addition to showing the funded ratio, this chart also shows the breakdown of the plan’s liabilities by membership status:

- Active liability – the liability (attributable to service already performed) for future payments to members who are currently working in the System,
- Deferred Vested liability – the liability for future payments to members who are no longer working in the System but due a benefit, and
- In-Pay liability – the liability for future payments to retirees and beneficiaries who are currently receiving benefits.

This breakdown shows that today plan assets only cover about 29% of the liabilities for just those members currently in pay status.



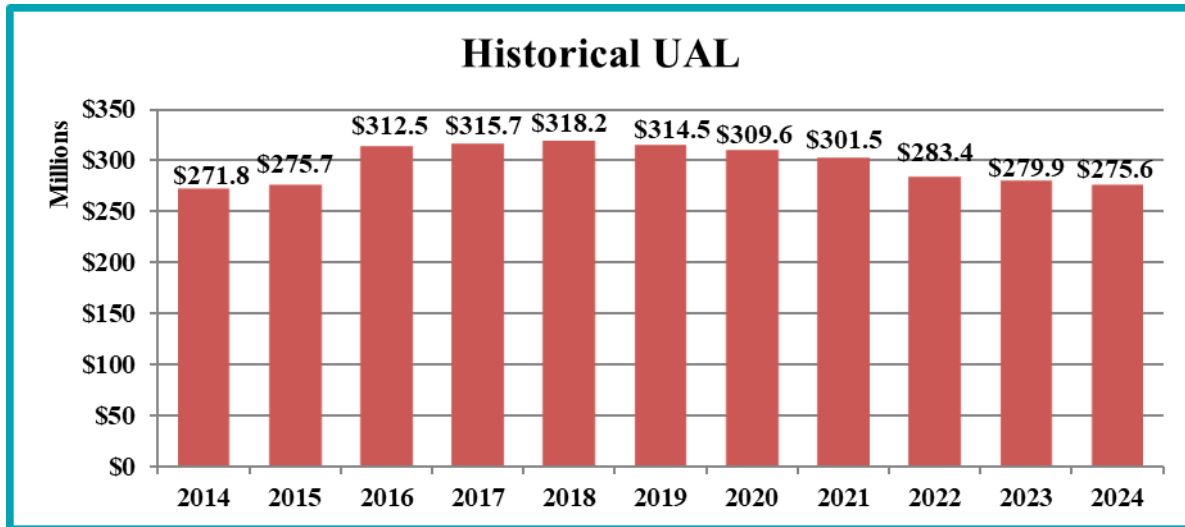
Source: Cheiron analysis of funding adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Sources of Changes in the UAL

As shown in the chart below, GARS' Unfunded Actuarial Liability (UAL) has grown from \$271.8 million in 2014 to \$275.6 million in 2024, an increase of about \$4 million, though it has decreased since 2018. It is important to understand the sources contributing to changes in the UAL.



Source: Cheiron analysis of funding adequacy.

The following analysis and graph provide the changes to the UAL from June 30, 2014 to June 30, 2024 from the following components:

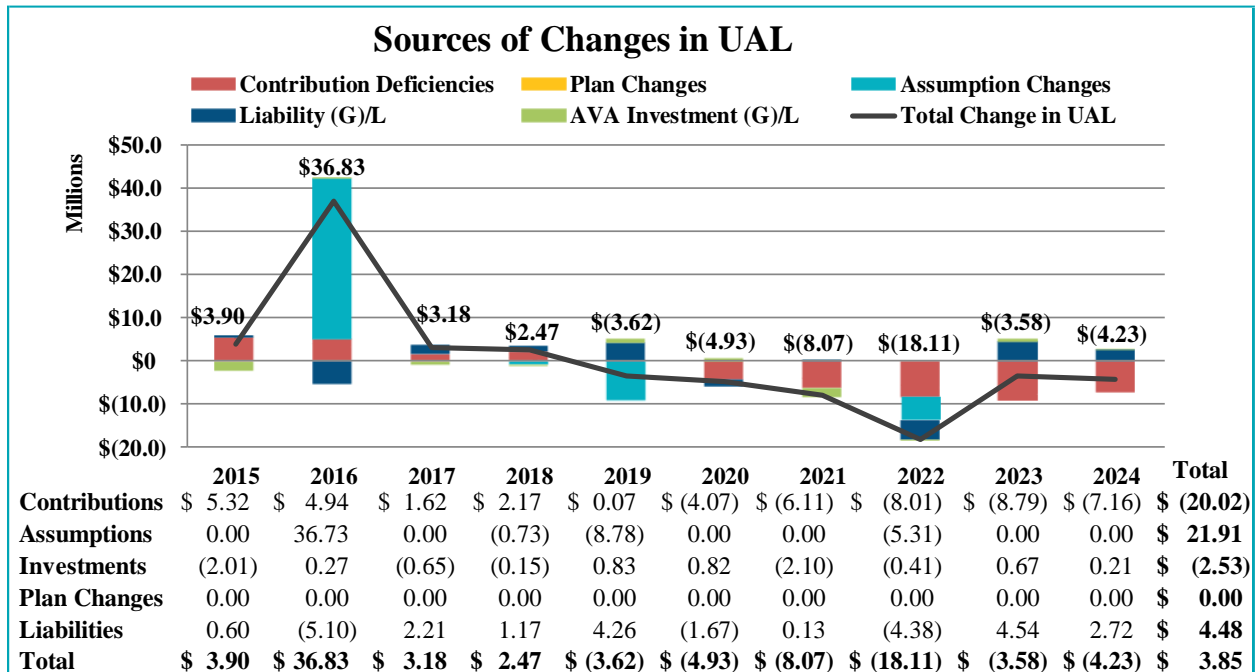
- **Contribution Deficiencies** – Contributions that are less than the tread water contribution causes the UAL to increase. The tread water contribution consists of two components: the normal cost, which is the cost of benefits earned in a given year, and the interest on the Unfunded Actuarial Liability. This sum is referred to as the tread water contribution because it is the contribution necessary so that the UAL will remain constant, or “tread water” (absent experience gains or losses). For each year from 2015-2019, contributions were below tread water which increased the UAL by \$14.1 million. However since 2020, contributions have been above tread water, which decreased the UAL by \$34.1 million. The difference between actual contributions and the tread water contributions decreased the UAL by \$20.0 million over this period.
- **Assumption Changes** – changes to actuarial assumptions over this period increased the UAL by \$21.9 million. A positive aspect of the UAL increases due to assumption changes is that they will result in liability measurements that more accurately reflect future expectations.
- **Plan Changes** – modifications to the design of the plan did not occur in this period.

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- **Liability (Gain) or Loss** – the changes in the UAL due to net liability experience (i.e., mortality, terminations, retirements, salary increases, etc.) were generally small and increased the UAL by \$4.5 million over this period.
- **AVA (Actuarial Value of Assets) Investment (Gain) or Loss** – the net investment gain or loss due to assets earning more or less than assumed decreased the UAL over this period by \$2.5 million.

The chart below shows the changes in UAL each year broken into these five components. The sum of all the components (total change in UAL) is shown as the black line. Values of each component as well as total by year are shown in the chart along with the totals for the period.



Source: Cheiron analysis of funding adequacy.

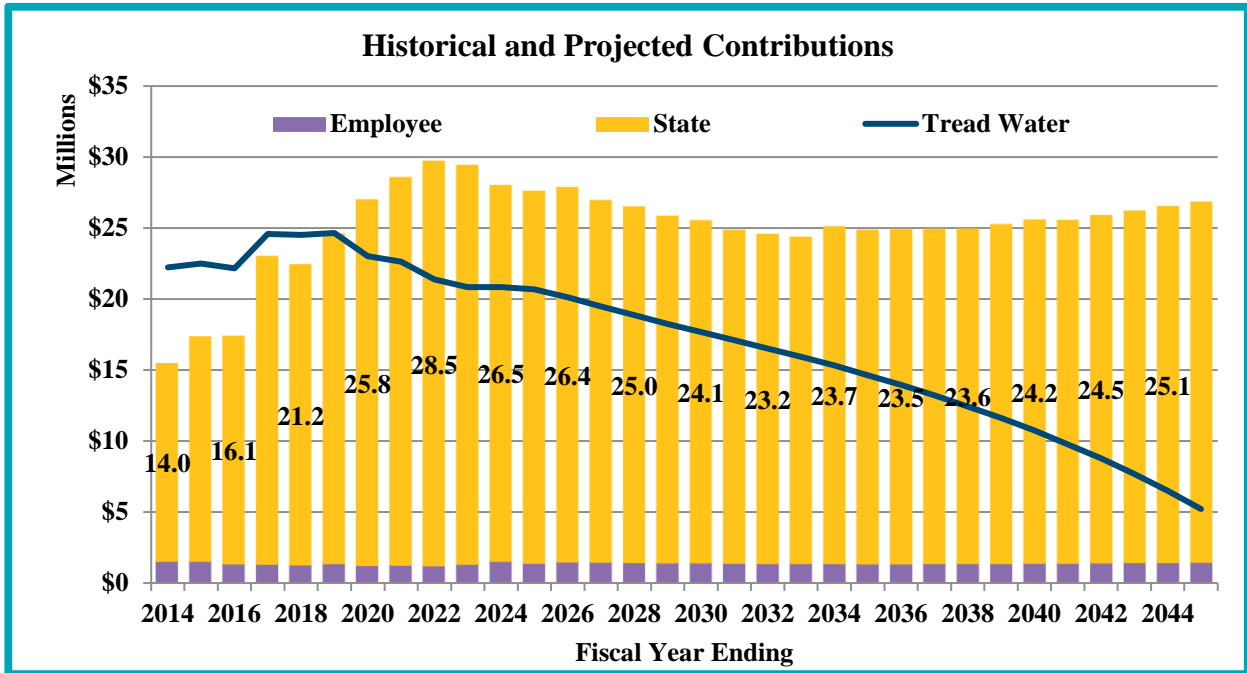
We expect that this chart will help stakeholders understand the sources of growth in the UAL over recent years and inform discussions about the current funding requirements and adequacy.

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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Actual Contributions Compared to Tread Water Contribution

One of the historical sources of the increase in UAL is due to actual contributions to the System being less than the tread water contribution (the amount needed to prevent the UAL from increasing if all assumptions are met). As the chart below shows, actual contributions had been less than the tread water cost prior to 2020. Starting in 2020, contributions have exceeded tread water. Each year that total contributions remain above the tread water cost (blue line), the UAL is expected to decline.



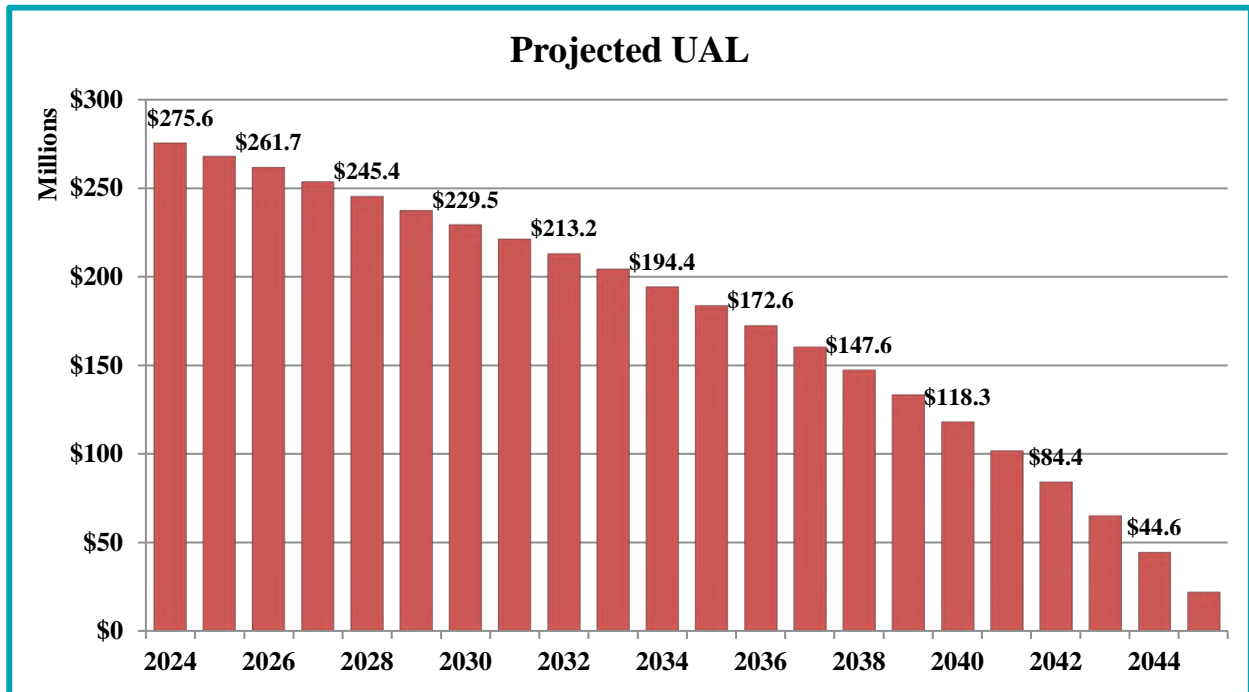
Source: Cheiron analysis of funding adequacy.

The System’s actuary commented that “the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution”. It isn’t clear what standard the System’s actuary is using to make this determination.

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The next chart shows that if the statutory contributions continue to be made each year and all other assumptions are met, the UAL is projected to decline from \$276 million in 2024 to \$22 million in 2045.



Source: Cheiron analysis of funding adequacy.

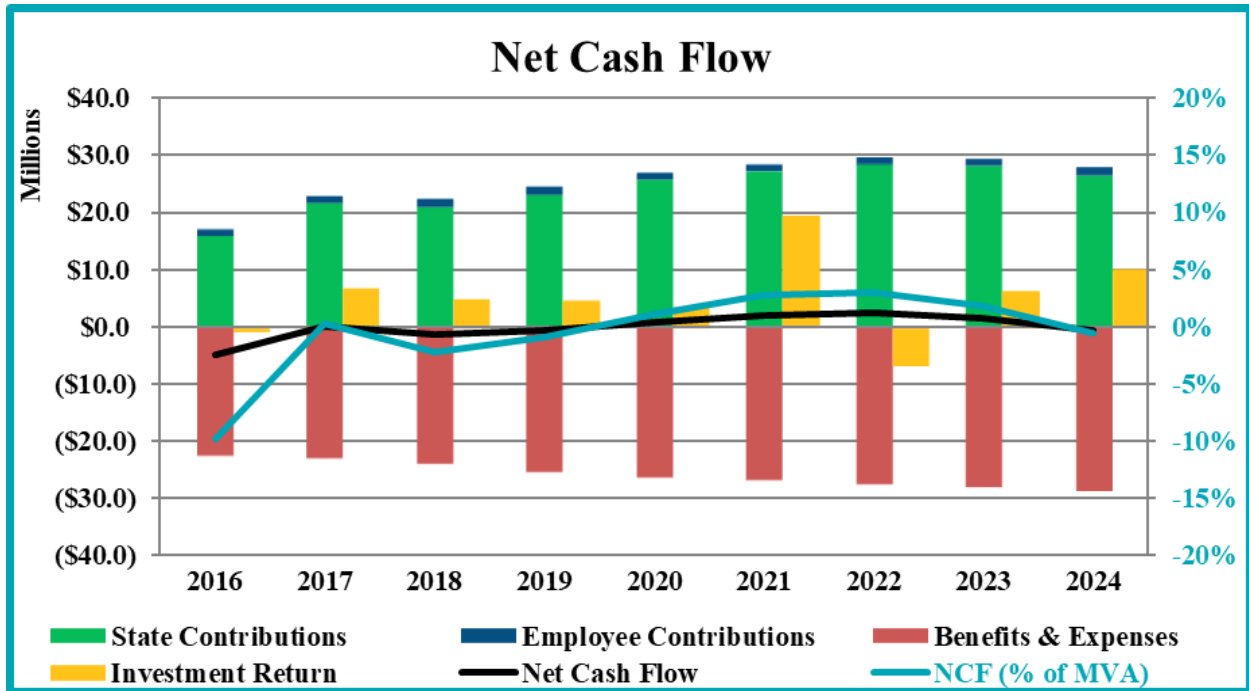
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SECTION V – ANALYSIS OF FUNDING ADEQUACY

Net Cash Flow Analysis

The Plan's net cash flow is defined as State and Member contributions less benefit payments and administrative expenses. The more negative net cash flow is as a percentage of the plan's assets, the more vulnerable the Plan is to market downturns. When a pension plan has more payouts than contributions and suffers an investment loss, it is left with fewer assets to invest and recapture during a recovery.

Looking at the following chart, GARS is neither mature nor immature on a net cash flow basis (black line), as the net cash flow has been close to zero relative to the size of the System's assets. This measure should continue to be monitored as a negative cash flow would increase the System's vulnerability to market downturns. The teal line shows net cash flow as a percent of Market Value of Assets on the right-side axis. The net cash flow has been slightly positive in recent years, which means that contributions into the Plan has exceeded the benefits and expenses paid out. However, currently the plan has slight negative cash flow for FY 2024.



Source: Cheiron analysis of funding adequacy.

GRS's graph of cash flows on page 10 of the draft June 30, 2024 Actuarial Valuation shows that benefit payments and expenses in the years 2031 to 2033 are expected to come close to exceeding contributions and investment income at 6.50%. This should be monitored closely as assets can deteriorate quickly if investments earn less than what is assumed.

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

Response to Recommendations in 2023

In the State Actuary’s Preliminary Report on the General Assembly Retirement System of Illinois dated December 18, 2023, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in either the System’s comments last year, last year’s final June 30, 2023 Actuarial Valuation, or in this year’s draft June 30, 2024 Actuarial Valuation.

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.	Not Implemented	<p>The System has adopted a funding policy that would provide for annual State contributions, the Actuarially Determined Contribution; however, the actual funding of the System is based on State statute and a change in the funding method and funding policy would require a statutory change.</p> <p>GRS continues to include strong language throughout their report recommending the use of an actuarially sound method and stating clearly that the statutory method is not actuarially sound. We find these statements to be appropriate and support their continuation.</p> <p>Recommendation repeated.</p>
2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.	Not Implemented	<p>This period is determined by Public Act 100-0023 and would require a statutory change.</p> <p>Recommendation repeated.</p>
3. Section 3.2 of ASOP 51 requires the actuary to identify risks that “may reasonably be anticipated to significantly affect the plan’s future financial condition.” [emphasis added]. The risks currently identified appear to largely duplicate the list of examples in ASOP 51 and could	Implemented	<p>In GRS’ letter regarding stress testing dated December 18, 2023, they identify the risks that may significantly affect the plan and explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition.</p> <p>Recommendation removed.</p>

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

<p>apply to almost any pension plan. For the 2023 valuation, we recommend that the actuary explain how each risk identified would reasonably be anticipated to significantly affect the specific plan’s future financial condition.</p>		
<p>4. For each risk identified above, Section 3.3 of ASOP 51 requires the actuary to provide an assessment that takes into account “circumstances specific to the plan.” For some of the identified risks, the actuary has provided a quantitative assessment specific to the plan while for other identified risks, the actuary has only provided a generic statement that could apply to any plan. We recommend that for each identified risk the actuary provide an assessment, preferably quantitative, that considers the specific circumstances of this plan.</p>	<p>Implemented</p>	<p>In GRS’ letter regarding stress testing dated December 18, 2023, they provide an assessment that takes into account “circumstances specific to the plan” and provide quantitative assessment specific to the plan.</p> <p>Recommendation removed.</p>
<p>5. We recommend the GARS Board continue to annually review the economic assumptions (interest rate, inflation, and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.</p>	<p>Implemented</p>	<p>GRS has continued to do this, most recently providing a review in the <i>Economic Assumption Update Review</i> report dated May 1, 2024.</p> <p>We will continue to include this recommendation each year.</p> <p>Recommendation continued.</p>
<p>6. We recommend that GRS include annual opt-out data in the Active Membership table shown on page 11 of the Actuarial Valuation.</p>	<p>Not Implemented</p>	<p>GRS responded that they would consider adding the opt-out information for the 2024 actuarial valuation report, as appropriate, and if the data is readily available.</p> <p>GRS did not make changes in the draft 2024 actuarial valuation report.</p> <p>Recommendation repeated.</p>

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<p>7. We recommend GRS expand the participant data section to include average pay and service for active members and information on inactive members owed a benefit in the future. In addition, a reconciliation of changes in member status from the prior year to the current year would improve the user’s understanding of membership changes.</p>	<p>Implemented</p>	<p>GRS responded that they would add the average pay and service statistics for active and inactive members for the 2024 valuation and would consider adding a participant status reconciliation for the 2024 valuation.</p> <p>GRS included average pay and service members for active and inactive members and a reconciliation of changes in member status.</p> <p>Recommendation removed.</p>
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Chapter Six

Preliminary Report on the Chicago Teachers' Pension Fund

In accordance with 40 ILCS 5/17-127(e), Cheiron, the State Actuary, submitted a preliminary report to the Board of Trustees of the Chicago Teachers' Pension

Fund (CTPF) concerning proposed certifications of required State contributions submitted to Cheiron by the Board. The preliminary report was submitted to CTPF on November 26, 2024. The preliminary report was based on Cheiron's review of actuarial assumptions included in CTPF's 2024 Actuarial Valuation Report.

Following is Cheiron's final preliminary report on the Chicago Teachers' Pension Fund. CTPF's written response, provided on December 10, 2024, can be found in Appendix D.

OVERVIEW**CHICAGO TEACHERS' PENSION FUND**

as of June 30, 2024

Actuarial accrued liability	\$26,835,128,764
Actuarial value of assets	\$12,898,414,480
Unfunded liability	\$13,936,714,284
Funded ratio	48.1%

State contribution (FY26)	\$F#,838,000
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Active members	33,089
Inactive members	7,018
Current benefit recipients	27,359
Non-vested eligible for refunds	<u>29,088</u>
Total membership	96,554

Interest rate assumption	6.50%
Inflation assumption	2.25%
Actuarial cost method	Projected Unit Credit
Asset valuation method	4-year Smoothing

Executive Director	Carlton Lenoir
Actuarial Firm	Gabriel, Roeder, Smith & Company

Source: June 30, 2024 CTPF actuarial valuation report.

December 13, 2024

Mr. Frank Mautino
Auditor General
400 W. Monroe Street
Springfield, Illinois 62704

Board of Trustees
Public School Teachers' Pension and Retirement Fund of Chicago
425 S. Financial Place
Suite 1400
Chicago, Illinois 60605-1000

Dear Trustees and Auditor General:

In accordance with Illinois Public Act 100-0465, Cheiron is submitting this preliminary report concerning the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contribution to the Public School Teachers' Pension and Retirement Fund of Chicago (CTPF or System) for Fiscal Year 2026.

In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified portion of the contribution which the State is responsible for was properly calculated.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings and recommendations. Section III provides the supporting analysis for those findings and presents more details on our assessment of the actuarial assumptions and methods employed in GRS's Actuarial Certification, as well as our assessment of GRS's determination of the required State contribution for Fiscal Year 2026. Section III also includes additional comments relating to our findings and recommendations. Section IV provides some analysis of the projected contributions from the State. Finally, Section V provides an analysis of historical trends.

In preparing this report, we relied on information (some oral and some written) supplied by CTPF and GRS. This information includes actuarial assumptions and methods adopted by the CTPF Board, the results of the 2017 through 2022 experience analysis, the 2024 Economic Assumption Review, plan provisions, the draft June 30, 2024 Actuarial Valuation, and minutes of the 2024 CTPF Board of Trustee meetings during the results presentation. A detailed description of all information provided for this review is contained in the body of our report as Appendix B.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in

this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared exclusively for the Office of the Auditor General and the Public School Teachers' Pension and Retirement Fund of Chicago for the purpose described herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron

SIGNED ORIGINAL ON FILE

Janet Cranna, FSA, EA, MAAA, FCA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Heath Merlak, FSA, EA, MAAA, FCA
Principal Consulting Actuary

SIGNED ORIGINAL ON FILE

Jana R. Bowers, FSA, EA, MAAA
Associate Actuary

**THE STATE ACTUARY’S PRELIMINARY REPORT ON THE
PUBLIC SCHOOL TEACHERS’ PENSION AND RETIREMENT FUND OF CHICAGO
PURSUANT TO 40 ILCS 5/17-127(e)**

SECTION I – REPORT SCOPE

Illinois Public Act 100-0465 (the Act) amended the Illinois Pension Code (40 ILCS 5/17-127) and requires Cheiron, as the State Actuary, to review the actuarial assumptions and valuation of the Public School Teachers' Pension and Retirement Fund of Chicago (CTPF or System) and to issue to the CTPF Board this preliminary report on the proposed certification prepared by Gabriel, Roeder, Smith & Company (GRS) of the required State contribution for Fiscal Year (FY) 2026. Under the Act, the required State contribution consists of 0.544% of Teacher total capped payroll, plus the employer normal cost, plus an amount pursuant to paragraph (3) of Section 17-142.1 to defray health insurance costs. The purpose of this review is to identify any recommended changes to the actuarial assumptions and methods for the CTPF Board to consider before finalizing its certification of the required State contribution for FY 2026.

In addition to reviewing the Actuarial Certification of the required State contribution to CTPF, we have reviewed the “actuarial practices” of the Board. We have reviewed: (1) the use of a qualified actuary (as defined in the Qualification Standards of the American Academy of Actuaries) to prepare the annual actuarial valuation for determining the required State contribution; and (2) the conduct of periodic formal experience studies to justify the assumptions used in the actuarial valuation. In addition, we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2024 Actuarial Valuation.

Finally, this report is more limited in scope than the State Actuary reviews for the other Illinois Retirement Systems because the State’s responsibility is limited to the 0.544% of Teacher total capped payroll, the employer Normal Cost, and a subsidy to defray health insurance costs. The State is not responsible for the funding of the Unfunded Actuarial Liability of CTPF or the current and future contributions that may be necessary to achieve the legislative requirement that the City fund the Plan to 90% by 2059. The State is responsible for the funding of the other Illinois Systems, which requires the State Actuary to review and analyze the long-term projections and the State mandated funding method.

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SECTION II – SUMMARY OF RECOMMENDATIONS

This section summarizes recommendations from our review of the actuarial assumptions and methods employed in the draft June 30, 2024 Actuarial Valuation of CTPF as well as the “actuarial practices” of the CTPF Board. Section III of this report provides detailed analysis and rationale for these recommendations.

Proposed Certification of the Required State Contribution

Gabriel, Roeder, Smith & Company (GRS) has determined that the FY 2026 required State contribution calculated under the current statutory funding plan is \$346,838,000 pursuant to P.A. 100-0465. This amount represents the two cost components of the States funding obligation which includes the net employer normal cost amount including administrative expenses of \$281,838,000 plus the \$65,000,000 health insurance subsidy. In addition, the State contributes an amount equal to 0.544 percent of pay which is equal to \$16,256,000

We have verified the arithmetic calculations made by GRS to develop this required State contribution except with regard to the adjustment of the total normal cost before expenses from the valuation date to fiscal year 2026 and have reviewed the assumptions on which it was based.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

40 ILCS 5/17-127(e) requires the State Actuary to identify recommended changes in actuarial assumptions that the CTPF Board must consider before finalizing its certification of the required State contribution. We have reviewed all the actuarial assumptions used in the draft June 30, 2024 Actuarial Valuation, which are the same assumptions used in the June 30, 2023 Actuarial Valuation and based on the 2023 Actuarial Experience Study dated August 31, 2023, and conclude that the assumptions are reasonable in general, based on the evidence provided to us.

Recommended Changes for Future Valuations

1. We recommend the CTPF Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.
2. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

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SECTION III – SUPPORTING ANALYSIS

In this section, we provide detailed analysis and supporting rationale for the recommendations that were presented in Section II of this report.

Proposed Certification of the Required State Contribution

As stated in our summary of recommendations in Section II, we have verified the arithmetic calculations made by GRS to develop this State required contribution except with regard to the adjustment of the total normal cost before expenses from the valuation date to fiscal year 2026. The State required contribution is clearly identified in the Executive Summary.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

A. Economic Assumptions

The economic assumptions are documented in Appendix C, with select assumptions listed below. We reviewed the development of these assumptions based on the Actuarial Experience Study dated August 31, 2023, and the Economic Assumption Review dated September 9, 2024, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

1. Interest Rate

The interest rate assumption (also called the investment return or discount rate) is the most impactful assumption affecting the contribution requirement of the system. The assumption, which is used to value liabilities for funding purposes, remains at 6.50% for the draft June 30, 2024 Actuarial Valuation.

After reviewing all the materials (see Appendix B of the report) that were made available, Cheiron concludes that 6.50% for this valuation is reasonable.

We recommend the CTPF Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly (Recommendation #1).

Our rationale for this recommendation:

- In their September 9, 2024 Economic Assumption Review, GRS presented short-term return expectations of 12 selected investment consultants using a 10-year time horizon adjusted for the CTPF inflation assumption. This produced an arithmetic average one-year nominal return of 7.59%. Using the average standard deviation and return expectation GRS concluded that the median 10-year expected geometric return was 6.82% and there is approximately a 53% probability of exceeding 6.50%. This is based on a CTPF assumption of 2.25% as the long-term inflation assumption. GRS notes

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SECTION III – SUPPORTING ANALYSIS

that because 50% of the actuarial accrued liability as of June 30, 2023, is attributable to benefits that are projected to be paid in the next 10 years it is appropriate to consider a 10-year time horizon in addition to longer-term expectations when setting the economic assumptions.

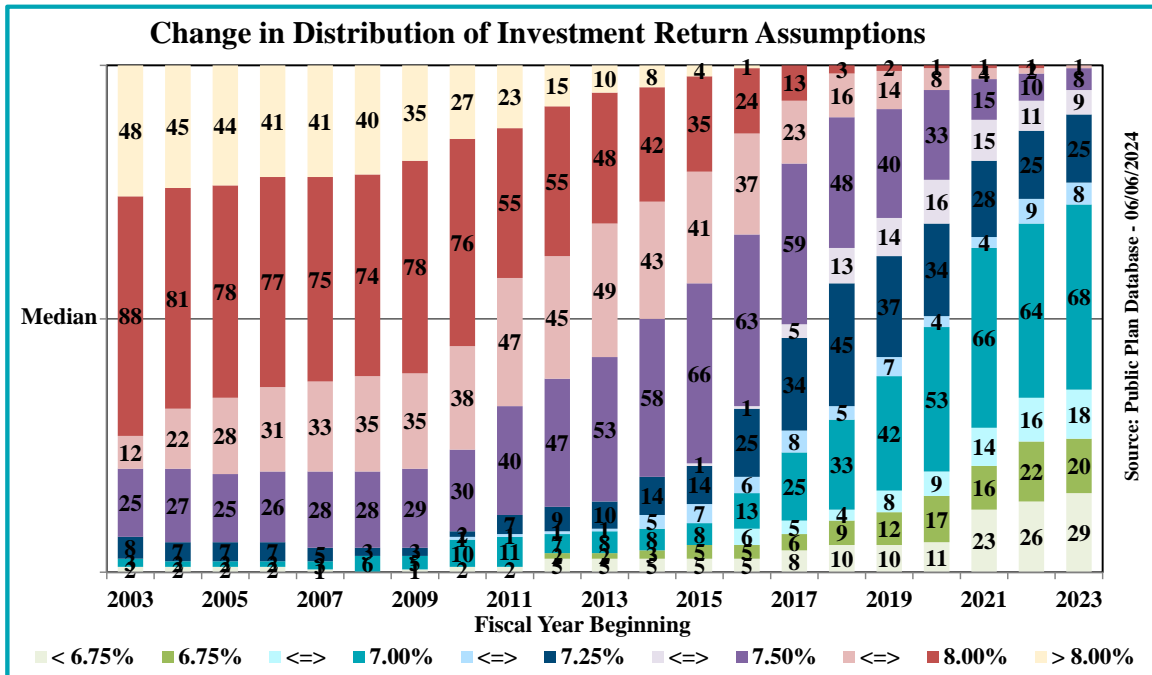
In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received (Recommendation #2).

Disclosing the names of the investment consulting firms that participated in the survey will provide added transparency and the ability to review how each firm's expectations have changed year to year. Market expectations can quickly change to reflect new information, trends and updated outlooks. Thus, knowing when the capital market assumptions were effective is also important.

- Using the average 10-year capital market assumptions in the 2024 Horizon survey, we calculated an expected 10-year geometric return of 7.01% for the CTPF asset allocation and approximately a 55% probability of exceeding 6.50%. Consequently, maintaining the current assumption of 6.50% is reasonable.
- While the discount rate assumption should be based on the future expected investment returns for the System's investment portfolio, survey information can provide an important context for evaluating the assumption. The Public Plans Database is maintained by a partnership between the Center for State and Local Government Excellence (SLGE) and the Center for Retirement Research at Boston College with support from the National Association of State Retirement Administrators (NASRA). This database contains historical information on large public pension plans, including key assumptions used in their actuarial valuations. The following chart shows the distribution of investment return assumptions for the 186 plans in the Public Plans Database with consistent information from 2003 through 2023 as of June 6, 2024.

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SECTION III – SUPPORTING ANALYSIS



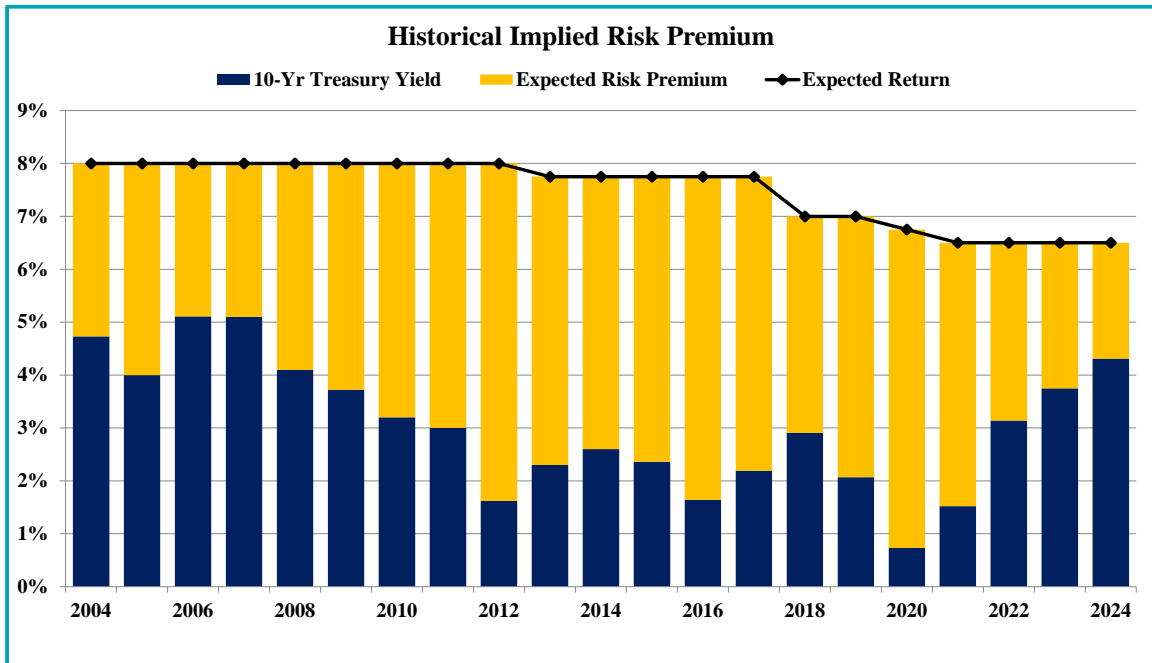
Over the period shown, there continues to be a pattern of reducing discount rates partially reflecting long-term changes in capital markets, interest rates and underlying inflation. Of the 186 plans shown, 128 have reduced their discount rate assumption since 2019. For these plans, the average reduction is 0.39%.

- Over the last two decades, declining interest rates have forced pension plans to either reduce their discount rates, increase their exposure to investment risk, or some combination of the two. For example, as shown in the following chart, in June 2006, the yield on 10-year Treasury bonds (a proxy for a risk-free investments) reached a high in the 20-year period of 5.1%. To achieve CTPF's then assumed return of 8.00%, the System's investments had to outperform the yield on the 10-year Treasury by 2.9%. In June 2020, the yield on the 10-year Treasury had dropped to 0.7%, and to achieve CTPF's assumed return of 6.75%, the System's investments needed to exceed the 10-year Treasury yield by 6.05%. Even though CTPF had reduced its return assumption by 125 basis points over the period, it still had to take more investment risk in 2020 to meet its assumption than it did in 2006. Since 2020, yields on 10-year Treasury bonds have increased, reducing the expected risk premium needed to achieve the System's assumed return. Yields on 10-year Treasury bonds have been approximately 4% during 2024; therefore, the System's investments currently only need to exceed the 10-year Treasury yield by about 2.50% to achieve the 6.50% assumed return, which is the lowest expected risk premium over the last 20 years. If these higher Treasury bond yields persist, plans may be able to achieve the expected return with less exposure to investment risk. However, if these higher Treasury bond yields prove temporary, plans

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SECTION III – SUPPORTING ANALYSIS

could quickly find the pressure returning to further reduce discount rates or increase their exposure to investment risk.



- As is the case with most maturing pension plans, CTPF is experiencing negative cash flows measured as contributions less benefits and expenses. CTPF’s negative cash flow is 3.53% of assets. When short-term returns are expected to be lower than the long-term expectations, a plan with negative cash flows will have actuarial returns (i.e., dollar weighted returns) that are less than “time weighted” returns.

2. Inflation Assumption

As recommended in the GRS September 9, 2024 Economic Assumption Review, the inflation assumption was maintained at 2.25% in the draft June 30, 2024 Actuarial Valuation.

We find the 2.25% inflation assumption to be reasonable.

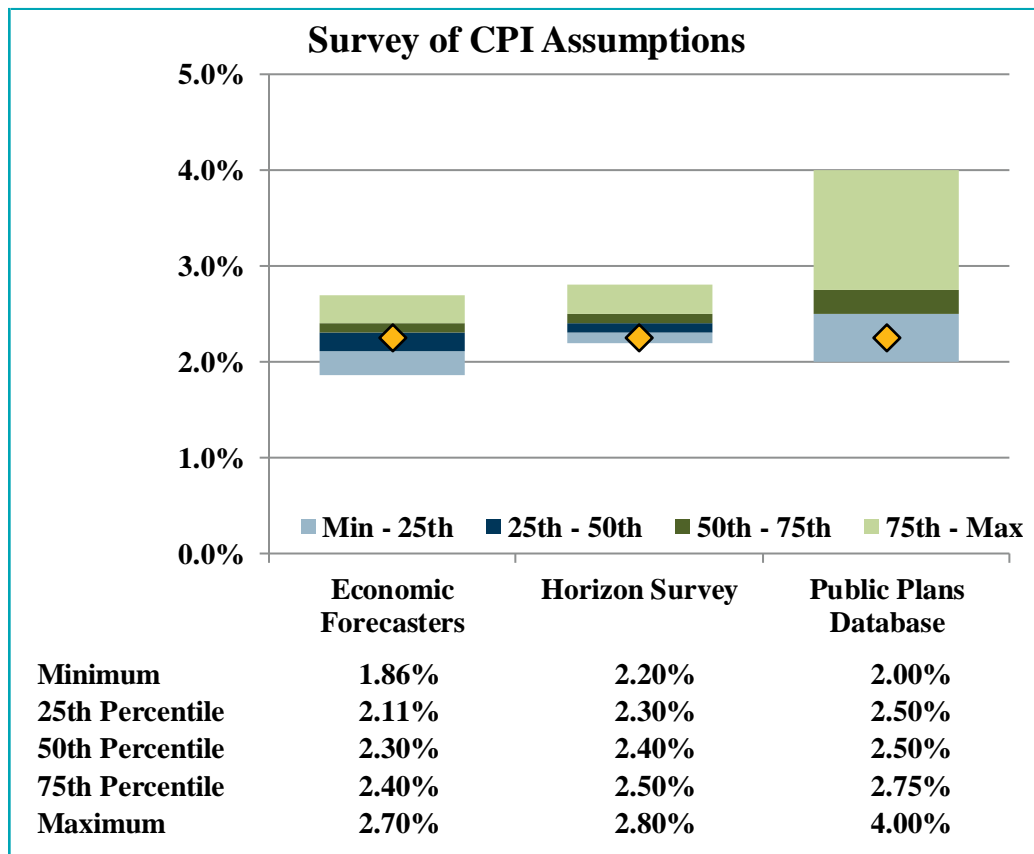
The items we considered and our rationale for concurring with the 2.25% assumption are as follows:

- On Pages 8 and 9 of the 2024 Economic Assumption Review, GRS provides significant data on inflation forecasts that provides a range of 2.19% to 2.50%. While the majority of the data presented point to slightly higher inflation than the current assumption, the current assumption remains within the reasonable range.

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- The May 2024 Old-Age, Survivors, and Disability Insurance (OASDI) Trustees Report projects that over the long-term (next 75 years), inflation will average between 1.8% and 3.0% (<http://www.ssa.gov/oact/tr/2024/tr2024.pdf>). Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.4%.
- The following chart shows the distribution of inflation expectations for the Third Quarter 2024 survey of professional economic forecasters published by the Philadelphia Federal Reserve, the 2024 Horizon survey of investment consultant capital market assumptions (20-year), and the 2023 inflation assumptions used by plans in the Public Plans Database compared to the CTPF assumption (indicated by the gold diamonds). The assumption of 2.25% is in the second quartile of the range projected by professional economic forecasters and the lowest quartile of the range projected by investment consultants and of the range used by other public pension plans.



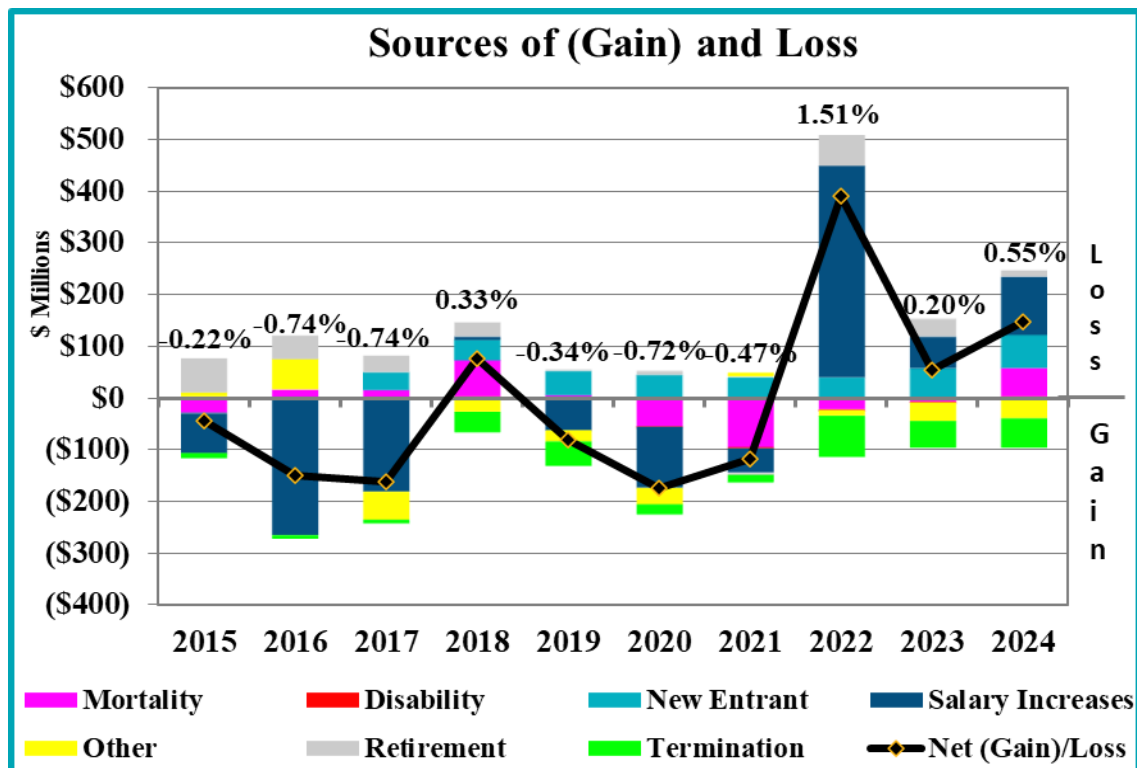
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B. Demographic Assumptions

In its annual actuarial valuation reports, CTPF regularly reports sources of liability gains and losses. In the 2024 draft report, these are shown on page 27. In the following chart, we have collected similar data from CTPF's past valuation reports dating back to 2015 and presented a historical review of past demographic and salary increase experience gains and losses.

The chart below shows the pattern of annual gains and losses attributable to seven different sources as shown in the legend. When the colored bar slices appear above zero on the Y-axis, it represents an experience loss with the value representing the increase in liabilities over what was expected. When the bar is below zero, it represents an experience gain for that year with liabilities less than expected. This net liability (gain)/loss is shown by the black line. This net (gain)/loss as a percent of liability is shown above the bars.



The percentages shown above the bars refer to net (gain)/loss as a percentage of liability.

Key observations from this chart are as follows:

1. After experiencing salary gains in most years from 2015-2021, there have been losses in the last three years. The recent losses likely reflect the impact of current levels of inflation and may not persist over the long term. Over the period of 2015 – 2024, salary increase experience resulted in a cumulative \$163 million gain.

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2. Most years, there were experience losses attributable to retirement. As anticipated by CPS's expectations, the trend appeared to have changed in the last few years but returned in 2022-2024. This assumption was changed effective with the June 30, 2023 valuation based on the 2023 Actuarial Experience Study and resulted in a smaller retirement loss this year.
3. Note that prior to 2017, New Entrant liability was not separately reported and is included in the 'Other' category.

The demographic assumptions are documented in Appendix C. We reviewed the development of these assumptions based on the Actuarial Experience Study dated August 31, 2023, and we have concluded all are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.

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C. Funding Methods

Actuarial funding methods consist of three components: (1) the actuarial cost method, which is the attribution of total costs to past, current, and future years; (2) the asset valuation method (i.e., asset smoothing); and (3) the amortization method.

1. Actuarial Cost Method

The System uses the projected unit credit cost method (PUC) to assign costs to years of service, as required under the Pension Code (40 ILCS 5/17). **We have no objections with respect to using the PUC method, although we, as GRS does, would prefer the Entry Age Normal (EAN) cost method as it is more consistent with the requirement in 40 ILCS 5/17-129 for level percent of pay funding.**

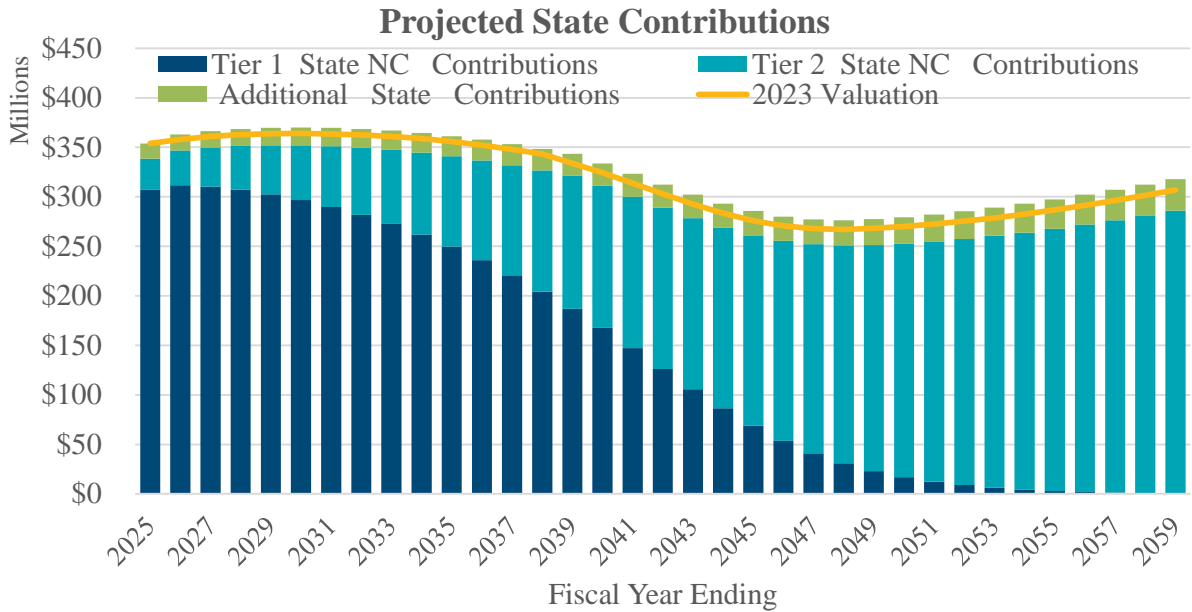
Under the PUC method, which is used by some public sector pension funds, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the valuation date but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the Actuarial Liability for a given active participant. Under the PUC cost method, the value of an active participant's benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. As a result of this pattern of benefit value increasing, while the PUC method is not an unreasonable method, more plans use the EAN cost method to mitigate this effect. It should also be noted that the EAN cost method is the required method to calculate liability for GASB Nos. 67 and 68.

While there is concern over the mandated funding method conforming to generally acceptable actuarial principles and practices, the State's obligation to fund CTPF is limited to payment of the future normal cost plus expenses and a health care subsidy. Consequently, we have not reviewed the asset valuation method, the amortization method, or the projection of the Unfunded Actuarial Liability.

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SECTION IV – PROJECTION ANALYSIS

This section reviews the projections of the State's contributions to CTPF. The State's contributions are equal to the employer normal cost, including a health insurance subsidy, plus an additional contribution equal to 0.544 percent of pay. The chart below compares the State's projected contributions contained in the draft June 30, 2024 Actuarial Valuation of CTPF to the same projections from the prior year.



The dark blue bars represent the projection of the State's normal cost contributions for Tier 1 members, and the teal bars represent the State's normal cost contributions for Tier 2 members. The green bars represent the additional State contribution, and the gold line represents the total projected State contribution from the 2023 actuarial valuation. The contribution is expected to increase gradually for the next several years before declining as Tier 2 members become the dominant portion of active membership. The Tier 2 normal cost under the projected unit credit method rises as the Tier 2 membership matures, ultimately increasing the State's contribution.

The slight increase in projected State contributions from the prior valuation is primarily due to the higher payroll than previously projected.

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SECTION V – ANALYSIS OF HISTORICAL TRENDS

In this section, we examine the historical trends of the funding for the System, including funded ratio, the sources of changes in the Unfunded Actuarial Liability (UAL), sources of contributions, and net cash flow. Because the State's obligation to fund CTPF is limited to the payment of future normal cost including a health care subsidy and an additional fixed percentage of covered payroll, we have not reviewed the projections or assessed the adequacy of anticipated future contributions. The primary risk to the State is that anticipated future normal costs increase.

Currently the System is 47.5% funded based on the Market Value of Assets. When coupled with the negative cash flow (where benefit payments and expenses exceed the contributions to the fund) of 3.53% of the market asset value, the risk of a declining funded ratio is increased. Even if the expected return on assets of 6.50% is met, only 2.97% (6.50% - 3.53%) of the return will be available to increase the asset value.

Insolvency risk increases if contributions increase to unsustainable levels. The State's current obligation is fixed at the net employer normal cost plus 0.544% of capped payroll and the health insurance subsidy. However, if the contributions required of the Board of Education become unsustainable, there could be additional risk of the State being called on to provide additional funding assistance through legislation. Therefore, it is important that the State understand the risks within the System, and GRS included stress testing of the System within the valuation report which tested the implications that volatile investment returns and the impact of changes in the active population have on the funded ratio and employer contributions. However, the more direct risk to the State is further reductions in the discount rate which will directly increase the State's contribution. Using current capital market assumptions, GRS indicated there is only a 53% chance of achieving a return equal to or greater than the current discount rate of 6.50%. The Board of Education currently bears the risk for the actual investment returns, but if the discount rate needs to be reduced further, the State contribution would increase. GRS provides a stress test scenario based on the 2023 actuarial valuation showing that a reduction in the discount rate from 6.50% to 6.25% would increase the State contribution by approximately \$28 million per year for the next 25 years and an increasing amount thereafter.

The actuarial valuation report prepared by GRS includes both traditional actuarial measurements, as well as some projections on pages 31 to 36, and stress test scenarios based on the prior valuation in Appendix 1 of the draft June 30, 2024 Actuarial Valuation report. Given the unique and substantial funding challenges faced by the CTPF and the implications of future reliance on the State for funding, this additional information is quite important and supplements the information we present here on funding adequacy to better inform the legislature and other stakeholders about the adequacy of the System's funding.

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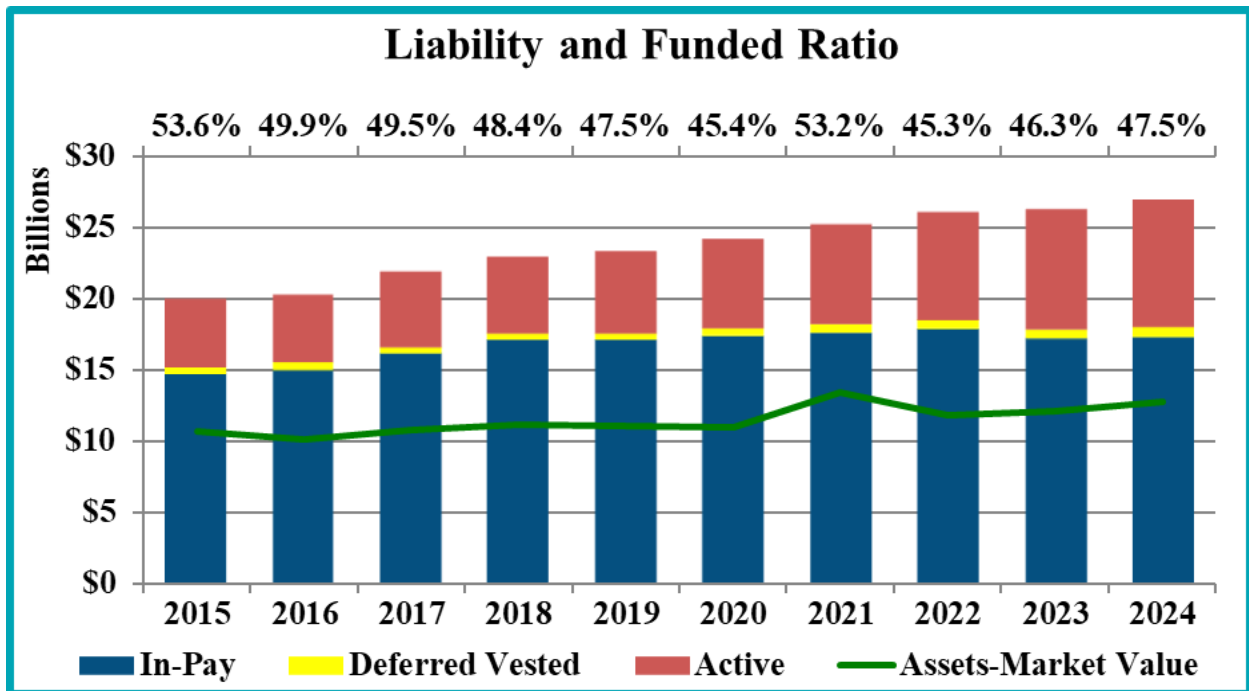
SECTION V – ANALYSIS OF HISTORICAL TRENDS

System Funded Ratio

The first trend measure is the System’s funded ratio for the past 10 years which is also included in the GRS report. Funded ratio for this purpose is defined as the ratio of the Market Value of Assets to the Actuarial Liability. The chart below shows that CTPF’s funded ratio has gone from 53.6% in 2015 to 47.5% in 2024, a decline in funded ratio of 6.1%. In addition to showing the funded ratio, this chart also shows the breakdown of the Plan’s liabilities by membership status:

- Active liability – the liability (attributable to service already performed) for future payments to members who are currently working in the System,
- Deferred Vested liability – the liability for future payments to members who are no longer working in the system, and
- In-Pay liability – the liability for future payments to retirees and beneficiaries who are currently receiving benefits.

This breakdown shows that today plan assets only cover about 74% of the liabilities for just those members currently in-pay status.



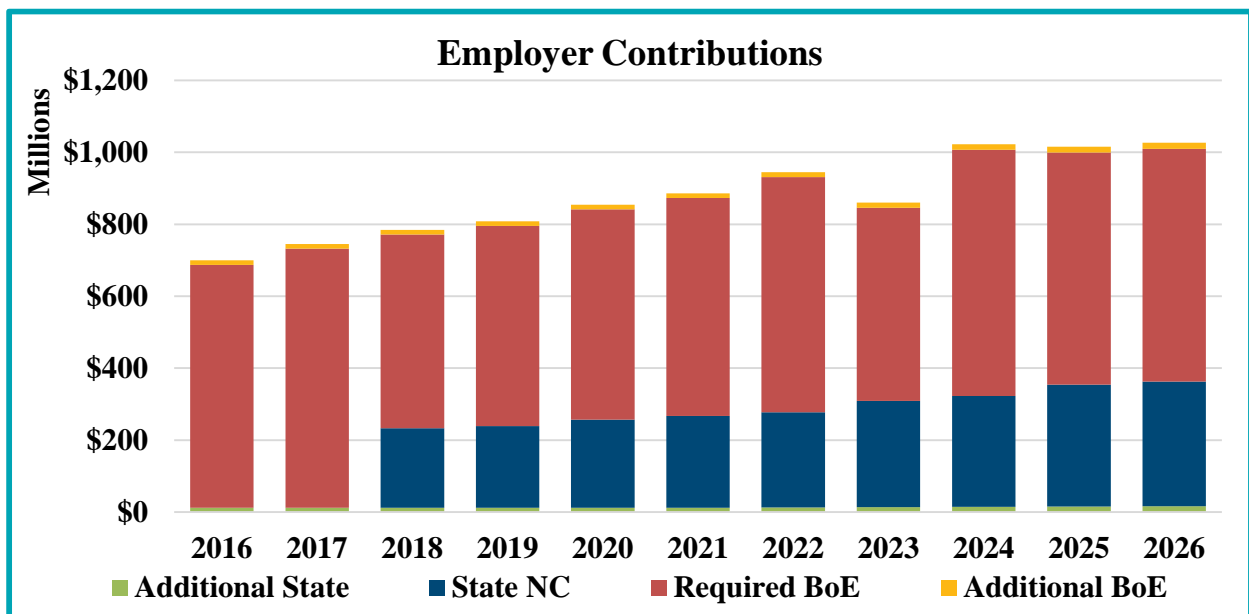
Source: Cheiron analysis of funding adequacy.

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Sources of Contributions

CTPF receives contributions from the Board of Education as well as the State. The chart below shows the source of employer contributions based on the last 10 actuarial valuations. Beginning in fiscal year 2018, the State began contributing the employer normal cost (blue bars). The Board of Education's required contribution toward the Unfunded Actuarial Liability (UAL) has continued to grow, with the exception of large investment returns for the 2021 fiscal year which reduced the contribution for the 2023 fiscal year. At the same time, reductions in the discount rate have increased the State's contribution for normal cost.



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Sources of Changes in the UAL

CTPF's UAL has grown from about \$9.5 billion in 2014 to \$13.9 billion in 2024, an increase of \$4.4 billion. To understand how to reverse this trend, it is important to understand the sources contributing to it. To the extent the sources contributing to the growth in UAL indicate a need to change assumptions, they may also indicate potential short-term risk of increased contributions for the State when assumptions are updated.

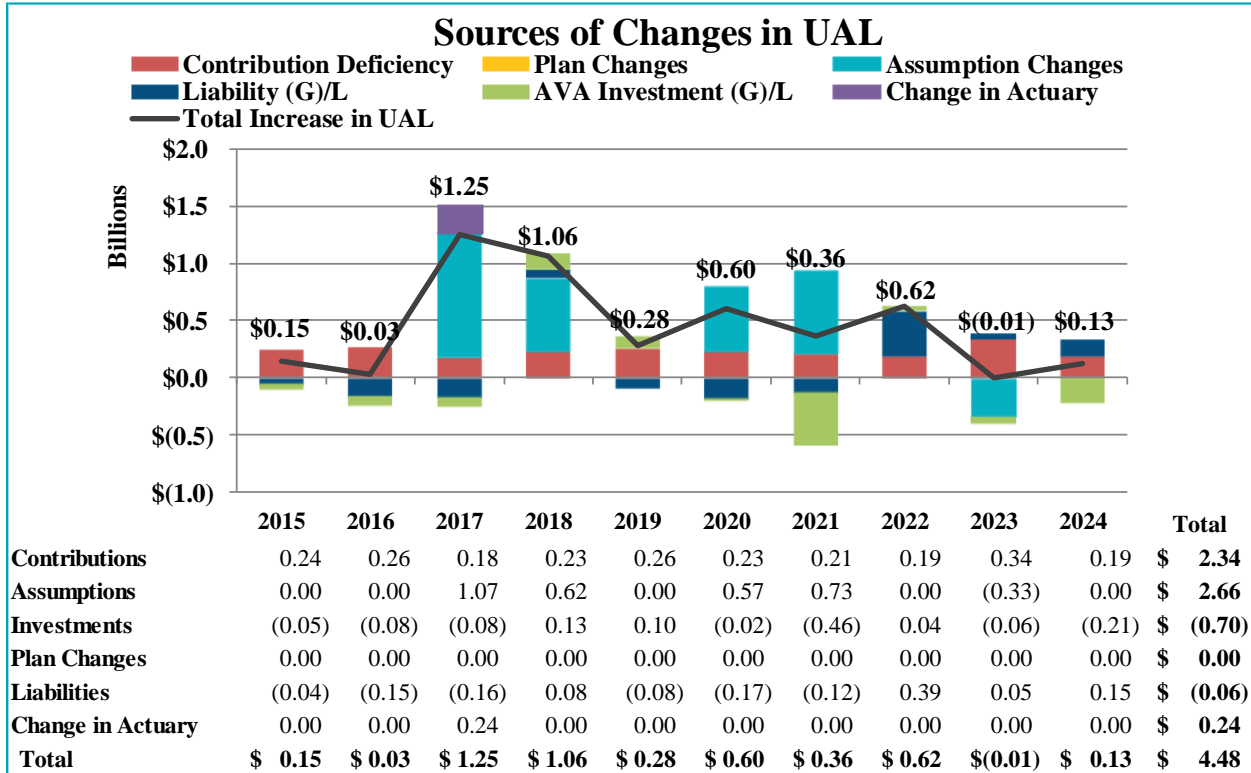
The changes to the UAL from June 30, 2014 to June 30, 2024 can be separated into the following components:

- **Contribution Deficiencies** – Contributions that are less than the tread water contribution cause the UAL to increase. The tread water contribution consists of two components: the normal cost, which is the cost of benefits earned in a given year, and the interest on the Unfunded Actuarial Liability. This sum is referred to as the tread water contribution because it is the contribution necessary so that the UAL will remain constant, or “tread water” (absent experience gains or losses). The difference between actual contributions and the tread water contributions increased the UAL by \$2.3 billion over this period.
- **Assumption Changes** – Changes to actuarial assumptions over this period increased the UAL by \$2.7 billion. A positive aspect of the UAL increases due to assumption changes is that they will result in liability measurements that more accurately reflect future expectations. Without the changes a similar UAL increase would show up as experience losses over time.
- **Plan Changes** – Modifications to the design of the Plan had no impact over this period as there were no changes affecting prior benefits.
- **Liability (Gain) or Loss** – The changes in the UAL due to liability experience (i.e., mortality, terminations, salary increases, etc.) were generally small and decreased the UAL by \$0.1 billion over this period.
- **AVA (Actuarial Value of Assets) Investment (Gain) or Loss** – The net investment gain or loss due to assets earning more or less than assumed decreased the UAL over this period by \$0.7 billion.

The chart on the next page shows the changes in UAL each year broken into these components. The sum of all the components (total change in UAL) is shown as the black line. Values of each component as well as total by year are shown in the chart along with the totals for the period.

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Source: Cheiron analysis of funding adequacy.

We expect that this chart will help stakeholders understand the sources of growth in the UAL over the past decade and inform discussions about the current funding requirements and adequacy.

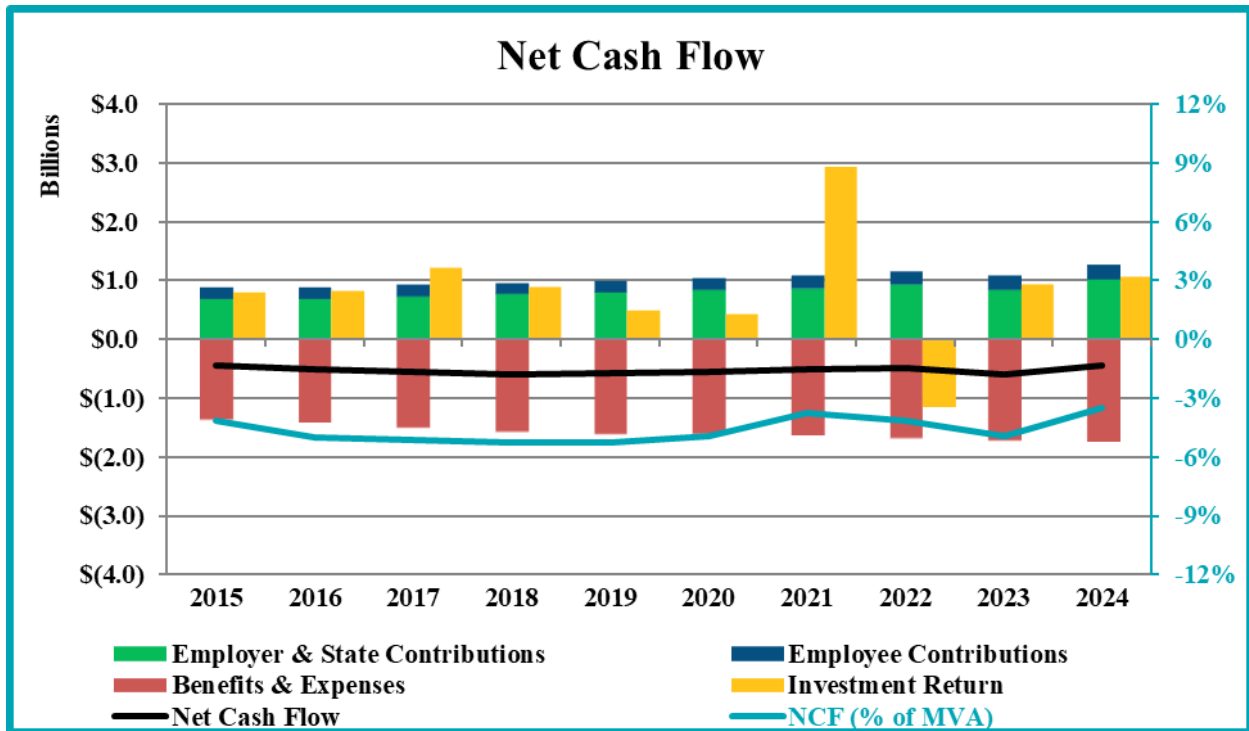
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Net Cash Flow Analysis

The plan's net cash flow (NCF) is defined as State and member contributions less benefit payments and administrative expenses. The more negative net cash flow is as a percentage of the plan's assets, the more vulnerable the Plan is to market downturns. When a pension plan has more payouts than contributions and suffers an investment loss, it is left with fewer assets to invest and recapture during a recovery.

Looking at the chart below, CTPF has a significant negative net cash flow (black line). If contributions increase as quickly as benefit payments, the net cash flow will remain stable. But if contributions do not continue to grow either because the Plan has become better funded or because the expected contributions are not made, negative net cash flow may become an even more significant issue, therefore it should continue to be monitored. The teal line shows net cash flow as a percent of Market Value of Assets on the right-side axis. The greater the negative cash flows are relative to plan assets the more vulnerable a plan is to market downturns. This is because once there is a market downturn, the plan assets lose both on the return and the negative cash flow, leaving it with a lower asset base from which to recover from the loss.



Source: Cheiron analysis of funding adequacy.

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STATUS OF RECOMMENDATIONS FROM THE 2023 STATE ACTUARY’S REPORT

Response to Recommendations in 2023

In the State Actuary’s Preliminary Report on the CTPF dated December 18, 2023, Cheiron made two recommendations. Below we summarize how these recommendations were reflected in either the System’s comments last year or in this year’s draft June 30, 2024 Actuarial Valuation.

Recommendations to Retirement System from 2023 State Actuary Report	Status	Comments
1. We recommend that GRS continue to include stress testing of the System within the valuation report, including the impact to the required State contribution of potential reductions in the discount rate.	Implemented	GRS included as an Appendix in the draft June 30, 2024 Actuarial Valuation Report Stress Testing Scenarios based on the June 30, 2023 Actuarial Valuation Results. These scenarios include both static and volatile return scenarios as well as scenarios testing a reduction in discount rate to 6.25% and an annual change in the number of active members of +1% and -1% for each of the next 10 years. The results show the impact on State and Board of Education contributions separately. Recommendation removed.
2. We recommend the CTPF Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.	Implemented	This recommendation has been addressed in the <i>2024 Economic Review</i> . We will continue to include this recommendation each year. Recommendation continued.

Appendix A

Illinois State Auditing Act (30 ILCS 5/2-8.1)

Sec. 2-8.1. Actuarial Responsibilities.

- (a) The Auditor General shall contract with or hire an actuary to serve as the State Actuary. The State Actuary shall be retained by, serve at the pleasure of, and be under the supervision of the Auditor General and shall be paid from appropriations to the office of the Auditor General. The State Actuary may be selected by the Auditor General without engaging in a competitive procurement process.
- (b) The State Actuary shall:
 - (1) review assumptions and valuations prepared by actuaries retained by the boards of trustees of the State-funded retirement systems;
 - (2) issue preliminary reports to the boards of trustees of the State-funded retirement systems concerning proposed certifications of required State contributions submitted to the State Actuary by those boards;
 - (3) cooperate with the boards of trustees of the State-funded retirement systems to identify recommended changes in actuarial assumptions that the boards must consider before finalizing their certifications of the required State contributions;
 - (4) conduct reviews of the actuarial practices of the boards of trustees of the State-funded retirement systems;
 - (5) make additional reports as directed by joint resolution of the General Assembly; and
 - (6) perform any other duties assigned by the Auditor General, including, but not limited to, reviews of the actuarial practices of other entities.
- (c) On or before January 1, 2013 and each January 1 thereafter, the Auditor General shall submit a written report to the General Assembly and Governor documenting the initial assumptions and valuations prepared by actuaries retained by the boards of trustees of the State-funded retirement systems, any changes recommended by the State Actuary in the actuarial assumptions, and the responses of each board to the State Actuary's recommendations.
- (d) For the purposes of this Section, "State-funded retirement system" means a retirement system established pursuant to Article 2, 14, 15, 16, or 18 of the Illinois Pension Code.

(Source: P.A. 97-694, eff. 6-18-12.)

Appendix B

Materials Reviewed by Cheiron

Following is a listing of information reviewed by Cheiron for each of the retirement systems. This is the information Cheiron relied upon in preparing the preliminary reports of the retirement systems.

Teachers' Retirement System:

- Illinois Law:
 - Illinois State Auditing Act (30 ILCS 5/2-8.1): Actuarial Responsibilities
 - Illinois Pension Code (40 ILCS 5/) Article 16: Teachers' Retirement System of the State of Illinois
 - Public Act (P.A.) 088-0593, P.A. 093-0002, P.A. 093-0839, P.A. 094-0004, P.A. 096-0043, P.A. 096-0889, P.A. 097-0694, P.A. 099-0232, P.A. 100-0023, P.A. 100-0340, P.A. 100-0587, P.A. 101-0010, P.A. 102-0718
- Files received from the Teachers' Retirement System:
 - RVK 2011-2024 Asset Allocation/Investment Performance Presentations
 - Buck IL TRS 2012-2015 Board Meeting Presentations and Memos
 - Segal IL TRS 2016-2024 Board Meeting Presentations
 - Board Meeting Minutes and Agendas from 2013-2022
 - Buck IL TRS 2007-2015 Valuation Reports
 - Segal IL TRS 2016-2024 Valuation Reports
 - Buck IL TRS 2012-2015 Certifications of Required State Contribution
 - Segal IL TRS 2016-2024 Certifications of Required State Contribution
 - Buck IL TRS Experience Analysis Reports for 2007, 2012, 2015
 - Segal IL TRS Experience Analysis 2016, 2017, 2018, 2021, 2024
 - Buck IL TRS spreadsheet with additional details on Section 4 of 2013-2015 AVRs
 - TRS Economic Impact Study of Benefits – May 2015
 - TRS Stress Testing Scenarios
- Other:
 - May 2014 *GFOA Best Practice – Actuarial Audits* published by the Government Finance Officers Association
 - 2024 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Retirement Systems Study
 - May 2024 *Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)
 - Public Plans Database as of June 2024
 - Survey of Professional Forecasters, Third Quarter 2024, Federal Reserve Bank of Philadelphia
 - Publication H.15 Selected Interest Rates, Board of Governors of the Federal Reserve System
 - CPI-All Urban Consumers, Bureau of Labor Statistics

- Quarterly Census of Employment and Wages, Bureau of Labor Statistics
- Survey of Capital Market Assumptions, 2022 – 2024 Editions, Horizon Actuarial Services, LLC

State Universities Retirement System

- Illinois Law:
 - Illinois State Auditing Act (30 ILCS 5/2-8.1): Actuarial Responsibilities
 - Illinois Pension Code (40 ILCS 5/) Article 15: State Universities Retirement System of Illinois
 - Public Act (P.A.) 088-0593, P.A. 093-0002, P.A. 093-0839, P.A. 094-0004, P.A. 096-0043, P.A. 096-0889, P.A. 097-0694, P.A. 099-0232, P.A. 100-0023, P.A. 100-0587, P.A. 103-0548
- Files received from the State Universities Retirement System:
 - Board Meeting Minutes and Agendas from 2013-2024
 - GRS IL SURS 2008-2024 Valuation Reports
 - GRS IL SURS 2012-2024 Certifications of Required State Contribution
 - GRS IL SURS DRAFT 2014-2024 GASB 67/68 Reports
 - GRS SURS 2015 Economic Assumptions Review Presentation & Report
 - GRS SURS 2018 Experience Review Report
 - GRS SURS 2021 Experience Review Report
 - GRS SURS 2024 Experience Review Report
 - SURS Asset Liability Study, Economic Assumption Review, and Recommendation Memos
 - Athena IL SURS Limited Scope Audit of the June 30, 2022 Actuarial Valuation
 - Athena IL SURS Audit of the 2021 Experience Review
 - NEPC IL SURS Asset Class Assumptions and Actions annual presentations
 - SURS Investment Plan Update FY 2012 - FY 2024
 - GRS IL SURS GASB 67 Plan Reporting and Accounting Schedules
- Other:
 - May 2014 *GFOA Best Practice – Actuarial Audits* published by the Government Finance Officers Association
 - 2024 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Retirement Systems Study
 - May 2024 *Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)
 - Public Plans Database as of June 2024
 - Survey of Professional Forecasters, Third Quarter 2024, Federal Reserve Bank of Philadelphia
 - Publication H.15 Selected Interest Rates, Board of Governors of the Federal Reserve System
 - CPI-All Urban Consumers, Bureau of Labor Statistics
 - Quarterly Census of Employment and Wages, Bureau of Labor Statistics

- Survey of Capital Market Assumptions, 2022 – 2024 Editions, Horizon Actuarial Services, LLC

State Employees' Retirement System

- Illinois Law:
 - Illinois State Auditing Act (30 ILCS 5/2-8.1): Actuarial Responsibilities
 - Illinois Pension Code (40 ILCS 5/) Article 14: State Employees' Retirement System of Illinois
 - Public Act (P.A.) 088-0593, P.A. 093-0002, P.A. 093-0839, P.A. 094-0004, P.A. 096-0043, P.A. 096-0889, P.A. 097-0694, P.A. 099-0232, P.A. 100-0023, P.A. 100-0587
- Files received from the State Employees' Retirement System:
 - SERS 2018 Experience Review for the Years July 1, 2015 to June 30, 2018
 - SERS 2021 Experience Review for the Years July 1, 2018 to June 30, 2021
 - Board Meeting Minutes and Agendas from 2013-2024
 - GRS IL SERS 2007-2024 Valuation Reports
 - GRS IL SERS 2012-2024 Certifications of Required State Contribution
 - GRS IL SERS spreadsheet with additional details on Tables 4 and 7-10 from 2014 & 2015 Valuation Reports
 - GRS IL SERS DRAFT 2014-2024 GASB 67/68 Reports
 - ISBI Fund Evaluation Reports 2015-2024
- Other:
 - May 2014 *GFOA Best Practice – Actuarial Audits* published by the Government Finance Officers Association
 - 2024 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Retirement Systems Study
 - May 2024 *Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)
 - Public Plans Database as of June 2024
 - Survey of Professional Forecasters, Third Quarter 2024, Federal Reserve Bank of Philadelphia
 - Publication H.15 Selected Interest Rates, Board of Governors of the Federal Reserve System
 - CPI-All Urban Consumers, Bureau of Labor Statistics
 - Quarterly Census of Employment and Wages, Bureau of Labor Statistics
 - Survey of Capital Market Assumptions, 2022 – 2024 Editions, Horizon Actuarial Services, LLC

Judges' Retirement System

- Illinois Law:
 - Illinois State Auditing Act (30 ILCS 5/2-8.1): Actuarial Responsibilities
 - Illinois Pension Code (40 ILCS 5/) Article 18: Judges' Retirement System of Illinois
 - Public Act (P.A.) 088-0593, P.A. 093-0002, P.A. 093-0839, P.A. 094-0004, P.A. 096-0043, P.A. 096-0889, P.A. 097-0694, P.A. 099-0232, P.A. 100-0023.
- Files received from the Judges' Retirement System:
 - JRS Experience Review for July 1, 2015 to June 30, 2018
 - JRS Experience Review for July 1, 2018 to June 30, 2021
 - Board Meeting Minutes and Agendas from 2013-2024
 - Goldstein & Associates JRS 2006 – 2011 Valuation Reports
 - GRS IL JRS 2012 – 2024 Valuation Reports
 - GRS IL JRS 2012 – 2024 Certifications of Required State Contributions
 - GRS IL JRS 2019 – 2021 and 2023 – 2024 Economic Assumption Update Review
 - GRS IL JRS 2024 Valuation Results presentation
 - GRS IL JRS spreadsheet with additional details on Tables 4 and 7-10 from 2014 & 2015 Valuation Reports
 - GRS IL JRS DRAFT 2015 – 2024 GASB 67/68 Reports
- Other:
 - May 2014 *GFOA Best Practice – Actuarial Audits* published by the Government Finance Officers Association
 - 2024 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Retirement Systems Study
 - May 2024 *Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)
 - Public Plans Database as of June 2024
 - Survey of Professional Forecasters, Third Quarter 2024, Federal Reserve Bank of Philadelphia
 - Publication H.15 Selected Interest Rates, Board of Governors of the Federal Reserve System
 - CPI-All Urban Consumers, Bureau of Labor Statistics
 - Quarterly Census of Employment and Wages, Bureau of Labor Statistics
 - Survey of Capital Market Assumptions, 2022 – 2024 Editions, Horizon Actuarial Services, LLC

General Assembly Retirement System

- Illinois Law:
 - Illinois State Auditing Act (30 ILCS 5/2-8.1): Actuarial Responsibilities
 - Illinois Pension Code (40 ILCS 5/) Article 2: General Assembly Retirement System of Illinois

- Public Act (P.A.) 088-0593, P.A. 093-0002, P.A. 093-0839, P.A. 094-0004, P.A. 096-0043, P.A. 096-0889, P.A. 097-0694, P.A. 099-0232, P.A. 100-0023
- Files received from the General Assembly Retirement System:
 - GARS Experience Study for July 1, 2018 to June 30, 2021
 - Board Meeting Minutes and Agendas from 2013 – 2024
 - Goldstein & Associates GARS 2006 – 2011 Valuation Reports
 - GRS IL GARS 2012 – 2024 Valuation Reports
 - GRS IL GARS 2012 – 2024 Certifications of Required State Contributions
 - GRS IL GARS 2019 – 2021 and 2023 – 2024 Economic Assumption Update Review
 - GRS IL GARS spreadsheet with additional details on Tables 4 and 7-10 from 2014 – 2023 Valuation Reports
 - GRS IL GARS DRAFT 2015 – 2024 GASB 67/68 Reports
- Other:
 - May 2014 *GFOA Best Practice – Actuarial Audits* published by the Government Finance Officers Association
 - 2024 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Retirement Systems Study
 - May 2024 *Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)
 - Public Plans Database as of June 2024
 - Survey of Professional Forecasters, Third Quarter 2024, Federal Reserve Bank of Philadelphia
 - Publication H.15 Selected Interest Rates, Board of Governors of the Federal Reserve System
 - CPI-All Urban Consumers, Bureau of Labor Statistics
 - Quarterly Census of Employment and Wages, Bureau of Labor Statistics
 - Survey of Capital Market Assumptions, 2022 – 2024 Editions, Horizon Actuarial Services, LLC

Chicago Teachers' Pension Fund

- Illinois Law:
 - Illinois Pension Code (40 ILCS 5/) Article 17: Public School Teachers' Pension And Retirement Fund--Cities Of Over 500,000 Inhabitants
 - Public Act (P.A.) 090-0566, P.A. 090-0582, P.A. 091-0357, P.A. 100-0465
- Files received from the Chicago Teachers' Pension Fund:
 - Goldstein & Associates CTPF 2007-2011 Valuation Reports
 - Segal CTPF 2012-2016 Valuation Reports
 - GRS 2017-2024 Valuation Reports
 - 2018 Actuarial Experience Study dated May 25, 2018.
 - 2023 Actuarial Experience Study dated August 31, 2023
 - 2024 Economic Assumption Review dated September 9, 2024

- Other:
 - May 2014 *GFOA Best Practice – Actuarial Audits* published by the Government Finance Officers Association
 - *2024 National Conference on Public Employees Retirement Systems* (NCPERS) Public Retirement Systems Study
 - May 2024 *Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)
 - Public Plans Database as of June 2024
 - Survey of Professional Forecasters, Third Quarter 2024 Federal Reserve Bank of Philadelphia
 - Publication H.15 Selected Interest Rates, Board of Governors of the Federal Reserve System
 - CPI-All Urban Consumers, Bureau of Labor Statistics
 - Quarterly Census of Employment and Wages, Bureau of Labor Statistics
 - Survey of Capital Market Assumptions, 2024 Edition, Horizon Actuarial Services, LLC

Appendix C

Summary of Actuarial Assumptions

Teachers' Retirement System

1. Interest Rate

7.00%

2. Inflation Rate

2.50%

3. Salary Increases

The components include 2.50% inflation (adopted effective June 30, 2022), plus merit and seniority increases. Salary increase rates are shown below.

Service	Rate (%)
1	8.50
2	7.00
3	6.50
4	6.50
5	6.25
6	6.00
7-8	5.75
9-11	5.50
12	5.25
13-14	5.00
15-16	4.75
17-18	4.50
19	4.25
20+	4.00

Salary increases are applied as of the beginning of the year.

4. Cost of Living for Tier 2 Assumption

For Tier 2 participants, benefits are increased annually equal to 50% of the consumer price index urban rates with a maximum of 3.0%. Therefore, the COLA assumption is 50% of assumed inflation, or 1.25%.

5. Tier 2 Capped Pay Assumption

Benefits for members hired after January 1, 2011, are calculated using pay that is capped under 40 ILCS 5/1-160. The pay cap increase assumption is 50% of assumed inflation, or 1.25%.

6. Severance Pay Assumption

20% percent of retirees are expected to receive additional pay of 10% of compensation in the final year before retirement.

7. Rates of Mortality

Healthy Post-Retirement PubT-2010 Retiree Mortality Table projected generationally with the 2024 Adjusted Scale MP-2021, with female rates multiplied by 91% for ages under 75 and 103% for ages 75 and older and male rates multiplied by 103% for ages under 85 and 111% for ages 85 and older.

Disabled Post-Retirement: PubNS-2010 Non-Safety Disabled Retiree Mortality Table projected generationally with the 2024 Adjusted Scale MP-2021, with no adjustments to female or male rates.

Beneficiary Post-Retirement: Pub-2010 Contingent Survivor Mortality Table projected generationally with the 2024 Adjusted Scale MP-2021, with female rates multiplied by 94% for all ages and male rates multiplied by 106% for all ages.

Pre-Retirement: PubT-2010 Employee Mortality Table projected generationally with the 2024 Adjusted Scale MP-2021, with female and male rates multiplied by 94% for all ages.

8. Rates of Termination

Termination rates based on service, for causes other than death, disability, or retirement.

Age	Under 5 Years of Service		5 or More Years of Service	
	Male	Female	Male	Female
25	6.50%	6.50%	3.75%	4.50%
30	7.25%	7.45%	3.00%	4.25%
35	7.45%	7.75%	1.75%	2.50%
40	8.70%	7.25%	1.50%	1.25%
45	10.20%	7.50%	1.00%	1.00%
50	11.10%	8.55%	0.75%	1.25%
55	12.00%	10.60%	2.00%	2.25%
60	16.30%	14.00%	3.00%	2.25%
65	29.25%	27.50%	3.00%	2.25%

9. Rates of Disability

Age	Males	Females
25	0.005%	0.015%
30	0.005%	0.024%
35	0.010%	0.036%
40	0.015%	0.042%
45	0.025%	0.060%
50	0.049%	0.107%
55	0.068%	0.119%
60	0.088%	0.160%

10. Rates of Retirement

a. Active Members Hired before January 1, 2011:

Age	Service			
	5 – 18	19 - 29	30-33	34+
54	0%	7%	24%	50%
55	0%	7%	24%	50%
56	0%	7%	27%	50%
57	0%	9%	33%	47%
58	0%	10%	33%	46%
59	0%	35%	50%	44%
60	23%	35%	59%	44%
61	16%	27%	36%	37%
62	17%	27%	43%	37%
63	16%	28%	38%	39%
64	26%	40%	46%	36%
65	28%	41%	45%	41%
66	25%	38%	39%	40%
67	25%	39%	40%	34%
68	23%	35%	44%	39%
69	29%	40%	37%	32%
70	100%	100%	36%	32%
71	100%	100%	35%	38%
72	100%	100%	100%	29%
73	100%	100%	100%	36%
74	100%	100%	100%	37%
75	100%	100%	100%	100%

b. Active Members Hired on or after January 1, 2011:

Age	Service				
	5 – 18	19 - 30	31	32-33	34+
≤ 61	0%	0%	0%	0%	0%
62	13%	15%	20%	25%	25%
63	8%	10%	15%	20%	20%
64	8%	10%	15%	20%	20%
65	8%	10%	15%	20%	20%
66	20%	10%	15%	20%	20%
67	20%	40%	70%	70%	70%
68	20%	40%	40%	40%	40%
69	20%	40%	40%	40%	40%
70	100%	100%	100%	100%	100%

c. Inactive Members

Hired before January 1, 2011		Hired on or after January 1, 2011	
Age	Rate	Age	Rate
55	50%	62	50%
56	15%	63	15%
57	15%	64	15%
58	15%	65	15%
59	50%	66	50%

11. Percent Married

For valuation purposes, 85% of members are assumed to be married. Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

12. Form of Payment

Single participants: Life Annuity

Married Participants:

Tier 1: 50% Joint and Survivor

Tier 2: 66 ²/₃% Joint and Survivor Annuity

13. Inactive Vested Buyout

Ten percent of future inactive vested members are assumed to receive a lump-sum buyout in lieu of an annuity at retirement. An additional 1% of current inactive vested members are assumed to elect the inactive vested buyout to reflect the re-issue of buyout election packages to all eligible current inactive vested participants during fiscal year 2023.

14. Buyout Period

Buyouts are assumed to be paid through fiscal year 2026, corresponding with the current buyout program ending date (June 30, 2026). This valuation assumes that additional funds will be allocated to TRS to pay for all assumed buyout payments, as needed.

15. Automatic Annual Increase Buyout

Twenty-five percent of eligible retiring Tier 1 members are assumed to receive a lump-sum buyout and a retirement annuity with automatic annual increases of 1.5% of the originally granted retirement benefit starting at the later of January 1 following age 67 and the first anniversary of retirement.

16. Optional Service Purchases

The liability for retirement benefits for active members who have not previously purchased optional service is increased to cover the employer cost of out-of-system service purchased in the last two years prior to retirement. The amount purchased varies by the amount of regular service at retirement. Representative amounts purchased at retirement, and other assumptions used, are as follows:

Regular Service at Retirement	Maximum Service Purchased
10 years	0.073 years
15 years	0.233 years
20 years	0.440 years
25 years	0.580 years
30 years	0.538 years
34 or more	None

- Actual optional service credit for each current member is provided by TRS;
- No additional service purchases will be assumed for members who currently have optional service credit;
- Members will not purchase service if it does not improve their pension benefit; and
- When optional service is purchased within the last two years prior to retirement, 25% of the cost is covered by member payments and the remaining cost is the responsibility of the employer.

A 25% factor is applied for Substitute, Part-Time, and Hourly-Paid members.

17. Sick Leave Service Credit

The assumed unused and uncompensated sick leave service credit at retirement varies by the amount of regular service at retirement. Representative assumed amounts of unused and uncompensated sick leave service are as follows:

Regular Service at Retirement	Sick Leave Service Credit
10 years	0.291 years
15 years	0.692 years
20 years	0.949 years
25 years	1.148 years
30 years	1.371 years
34 years	1.623 years
35 or more	None

A 25% factor is applied for Substitute, Part-Time, and Hourly-Paid members.

18. Future Service Accrual Rate:

1.00 years of service per year for current and future Full-time and Regular Part-Time members. Actual service accrual in the prior year for current Substitute, Part-Time, and Hourly-Paid members.

0.33 years of service per year for future Substitute, Part-Time, and Hourly-Paid members.

19. Administrative Expenses

The \$49,915,900 of administrative expenses is expected to be paid for the year beginning July 1, 2024. \$59,339,056 of administrative expenses is expected to be paid for the year beginning July 1, 2025. Each year thereafter, administrative expenses are assumed to increase by the rate at which payroll is expected to increase.

20. 2.2 Upgrade Assumption

For those active members who have already made a payment to upgrade past service prior to June 30, 1998, their benefits are based on their upgrading at the valuation date. For all other active members, they are assumed to upgrade at retirement.

21. COLA timing

Assumed to occur middle of year (effective January 1st)

22. Substitute, part-time, and hourly-paid minimum annual salary

\$1,000

23. Average cost of excess salary increases over 6% FAS Cap at retirement

\$2,200

24. Decrement timing

All decrements are assumed to occur middle of year, except for the 100% retirement rate assumptions which are assumed to occur beginning of year.

25. Census and Assets

The current actuarial valuation was based on the latest membership data available, which were submitted by the System for active, inactive, and retired members as of the prior valuation date. The valuation assumptions were used to project results to account for the one-year difference in the census date and the valuation date. Any change in liability due to changes in census between the collection date of the census information and the valuation date is captured in the next actuarial valuation.

26. New Entrant Assumption for Projections

Projected Normal Cost is based on an open group forecast with the number of active participants assumed to remain level for both full-time and substitute/hourly groups. The new entrants are assumed to enter the plan with an average age and an average pay as noted below, which is based on the same demographic profile as new entrants over the past 5 years (July 1, 2018 – June 30, 2023). New entrant salaries assumed to increase by 2.50% per annum during the projection period (adopted effective June 30, 2022).

Full-time and regular part-time:

Age	Male Salary	Male Proportion	Female Salary	Female Proportion
22	\$49,417	5.3%	\$48,729	28.6%
27	51,979	6.3	53,276	25.8
32	58,525	3.0	56,967	10.8
37	61,917	1.9	58,624	5.7
42	64,174	1.3	59,469	3.8
47	63,159	0.8	60,667	2.5
52	64,111	0.6	60,826	1.6
57	66,273	0.4	59,757	0.9
62	65,677	0.2	60,485	0.4
67	63,309	0.1	66,065	0.1

Substitutes, part-time, and hourly-paid

Age	Male Salary	Male Proportion	Female Salary	Female Proportion
22	\$22,639	6.6%	\$22,788	20.4%
27	23,025	6.1	23,344	12.7
32	22,417	2.7	21,433	7.8
37	21,993	1.7	19,529	8.5
42	21,665	1.3	19,305	9.1
47	21,612	1.2	19,318	6.4
52	20,666	1.1	19,435	4.5
57	20,826	1.1	19,275	2.8
62	19,974	1.1	19,208	1.8
67	19,356	1.1	18,783	1.1
70	18,751	0.5	19,107	0.4

State Universities Retirement System

1. Interest Rate

6.50%

2. Inflation Rate

2.40%

3. Salary (Annual Compensation) Increase Assumption

Each member's compensation is assumed to increase by 3.15% each year, 2.40% reflecting salary inflation, and 0.75% reflecting standard of living increases. That rate is increased for members with less than 34 years of service to reflect merit, longevity, and promotion increases. The rates are based on service at the beginning of the year and are as follows:

Service Year	Total Increase - Academic		Total Increase – Non-Academic	
	Under Age 50	50 and Older	Under Age 50	50 and Older
0-1	15.00%	13.00%	12.00%	11.00%
2	9.00%	9.25%	9.00%	8.25%
3	7.75%	7.50%	8.00%	7.00%
4	6.75%	6.75%	7.00%	6.00%
5	6.25%	6.25%	6.50%	5.50%
6	6.00%	5.75%	6.25%	5.25%
7	5.50%	5.25%	5.75%	4.75%
8-10	5.00%	4.25%	5.25%	4.50%
11-14	4.75%	3.75%	5.00%	4.00%
15-18	4.50%	3.50%	4.75%	3.75%
19	4.50%	3.25%	4.50%	3.50%
20-24	4.25%	3.25%	4.25%	3.50%
25-29	4.00%	3.25%	4.00%	3.50%
30-33	3.75%	3.25%	3.75%	3.50%
34+	3.50%	3.15%	3.50%	3.15%

4. Cost-of-Living Adjustment Assumption

Annual increases are 3.0% compounded for those hired before January 1, 2011, who did not elect the accelerated AAI payment and 1.50% simple for those who did elect an accelerated AAI payment. For those hired on or after January 1, 2011, the assumed annual rate is 1.20%.

5. Capped Pay Assumption

Benefits for members hired after January 1, 2011, are calculated using pay capped under 40 ILCS 5/1-160. The pay cap increase assumption is 1.20%.

6. Effective Rate of Interest

The assumed rate credited to member accounts is 7.00%.

7. Mortality

Future mortality improvements are reflected by projecting the base mortality tables from 2010 using the MP-2021 projection scale. The base mortality tables are as follows:

Applicable Group	Pub 2010 Base Mortality Table	Male Factor	Female Factor
Academic Employees			
Pre-retirement	Employee Mortality Table for Teachers	99%	100%
Post-retirement (non-disabled)	Healthy Retiree Mortality Table for Teachers	96%	103%
Post-retirement (disabled)	Disabled Retiree Mortality Table for Non-Safety Employees	122%	106%
Non-Academic Employees			
Pre-retirement	Employee Mortality Table for General Employees	120%	104%
Post-retirement (non-disabled)	Healthy Retiree Mortality Table for General Employees	102%	104%
Post-retirement (disabled)	Disabled Retiree Mortality Table for Non-Safety Employees	122%	106%
Police Employees			
Pre-retirement	Employee Mortality Table for Safety Employees	100%	100%
Post-retirement (non-disabled)	Healthy Retiree Mortality Table for Safety Employees	100%	100%
Post-retirement (disabled)	Disabled Retiree Mortality Table for Safety Employees	100%	100%

8. Marriage Assumption

Members are assumed to be married in the following proportions:

Age	Males	Females
20-24	10%	25%
25-29	35	45
30-34	60	65
35-39	70	70
40-44	75	75
45-59	80	75
60-89	80	70

Female spouses are assumed to be three years younger than male spouses.

9. Termination Rates

The termination rates are based on the most recent experience study period. The assumption is a table of turnover rates for each classification by years of service.

A sample of these rates follows:

Years of Service	Academic	Non-Academic
0	15.00%	14.00%
1	15.00	14.00
2	11.00	14.00
3	10.00	13.00
4	9.00	12.00
5	8.00	10.50
6	7.00	8.50
7	6.00	7.50
8	5.50	6.50
9	5.00	6.00
10	4.00	5.00
11	3.50	5.00
12	3.00	4.00
13	2.50	3.00
14	2.50	3.00
15	2.00	3.00
16	2.00	2.50
17	2.00	2.50
18	2.00	2.50
19	2.00	2.50
20	1.50	2.00
21	1.50	2.00
22	1.50	2.00
23	1.50	2.00
24	1.50	2.00
25	1.25	1.25
26	1.25	1.25
27	1.25	1.25
28	1.25	1.25
29	1.25	1.25

Part time members follow the above termination rates for valuation purposes.

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

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

10. Retirement Rates

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

Age	<u>Members Hired before January 1, 2011</u>				
	<u>Academic</u>		<u>Non-Academic</u>		<u>Police</u>
	<u>Normal Retirement</u>	<u>Early Retirement</u>	<u>Normal Retirement</u>	<u>Early Retirement</u>	<u>Normal Retirement</u>
Under					
50	55.0%	-	55.0%		-
50	55.0%	-	40.0%		50.0%
51	40.0%	-	30.0%		40.0%
52	40.0%	-	30.0%		40.0%
53	30.0%	-	30.0%		40.0%
54	30.0%	-	30.0%		40.0%
55	20.0%	4.0%	25.0%	8.5%	50.0%
56	18.0%	3.0%	25.0%	5.5%	30.0%
57	18.0%	4.0%	25.0%	6.0%	30.0%
58	18.0%	4.0%	25.0%	6.0%	30.0%
59	18.0%	4.0%	25.0%	8.0%	30.0%
60	12.0%	-	20.0%	-	20.0%
61	12.0%	-	15.0%	-	15.0%
62	12.0%	-	17.0%	-	15.0%
63	13.0%	-	17.0%	-	15.0%
64	13.0%	-	17.0%	-	15.0%
65	17.0%	-	25.0%	-	40.0%
66	17.0%	-	25.0%	-	40.0%
67	17.0%	-	25.0%	-	40.0%
68	17.0%	-	25.0%	-	40.0%
69	17.0%	-	25.0%	-	40.0%
70	17.0%	-	22.0%	-	100.0%
71-79	17.0%		22.0%		100.0%
80+	100.0%	-	100.0%	-	100.0%

<u>Members Hired on or After January 1, 2011</u>					
Age	<u>Academic</u>		<u>Non-Academic</u>		<u>Police</u>
	Normal Retirement	Early Retirement	Normal Retirement	Early Retirement	Normal Retirement
60	-	-	-	-	60.0%
61	-	-	-	-	25.0%
62	-	15.0%	-	20.0%	25.0%
63	-	10.0%	-	12.0%	25.0%
64	-	10.0%	-	12.0%	25.0%
65	-	10.0%	-	12.0%	15.0%
66	-	10.0%	-	12.0%	15.0%
67	30.0%	-	30.0%	-	15.0%
68	17.0%	-	25.0%	-	25.0%
69	17.0%	-	25.0%	-	25.0%
70	17.0%	-	22.0%	-	100.0%
71-79	17.0%	-	22.0%	-	100.0%
80+	100.0%	-	100.0%	-	100.0%

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

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

11. Disability Rates

A table of disability incidence with sample rates follows:

Age	<u>Academic</u>		<u>Non-Academic</u>		<u>Police</u>	
	Males	Females	Males	Females	Males	Females
20	0.00741%	0.01312%	0.02717%	0.03608%	0.05434%	0.07216%
21	0.00759%	0.01388%	0.02783%	0.03817%	0.05566%	0.07634%
22	0.00777%	0.01464%	0.02849%	0.04026%	0.05698%	0.08052%
23	0.00795%	0.01540%	0.02915%	0.04235%	0.05830%	0.08470%
24	0.00813%	0.01616%	0.02981%	0.04440%	0.05962%	0.08888%
25	0.00831%	0.01692%	0.03047%	0.04653%	0.06094%	0.09306%
26	0.00849%	0.01768%	0.03113%	0.04862%	0.06226%	0.09724%
27	0.00867%	0.01844%	0.03179%	0.05071%	0.06358%	0.10142%
28	0.00885%	0.01924%	0.03245%	0.05291%	0.06490%	0.10582%
29	0.00900%	0.02000%	0.03300%	0.05500%	0.06600%	0.11000%
30	0.00945%	0.02164%	0.03465%	0.05951%	0.06930%	0.11902%
31	0.00990%	0.02328%	0.03630%	0.06402%	0.07260%	0.12804%
32	0.01035%	0.02492%	0.03795%	0.06853%	0.07590%	0.13706%
33	0.01077%	0.02656%	0.03949%	0.07304%	0.07898%	0.14608%
34	0.01122%	0.02820%	0.04114%	0.07755%	0.08228%	0.15510%
35	0.01185%	0.02980%	0.04345%	0.08195%	0.08690%	0.16390%
36	0.01245%	0.03144%	0.04565%	0.08646%	0.09130%	0.17292%
37	0.01308%	0.03308%	0.04796%	0.09097%	0.09592%	0.18194%
38	0.01371%	0.03472%	0.05027%	0.09548%	0.10054%	0.19096%
39	0.01431%	0.03636%	0.05247%	0.09999%	0.10494%	0.19998%
40	0.01608%	0.03800%	0.05896%	0.10450%	0.11792%	0.20900%
41	0.01785%	0.03964%	0.06545%	0.10901%	0.13090%	0.21802%
42	0.01962%	0.04128%	0.07194%	0.11352%	0.14388%	0.22704%
43	0.02139%	0.04292%	0.07843%	0.11803%	0.15686%	0.23606%
44	0.02316%	0.04456%	0.08492%	0.12254%	0.16984%	0.24508%
45	0.02535%	0.04620%	0.09295%	0.12705%	0.18590%	0.25410%
46	0.02757%	0.04784%	0.10109%	0.13156%	0.20218%	0.26312%
47	0.02979%	0.04948%	0.10923%	0.13607%	0.21846%	0.27214%
48	0.03198%	0.05112%	0.11726%	0.14058%	0.23452%	0.28116%
49	0.03420%	0.05276%	0.12540%	0.14509%	0.25080%	0.29018%
50	0.03642%	0.05440%	0.13354%	0.14960%	0.26708%	0.29920%
51	0.03861%	0.05604%	0.14157%	0.15411%	0.28314%	0.30822%
52	0.04083%	0.05768%	0.14971%	0.15862%	0.29942%	0.31724%
53	0.04305%	0.05932%	0.15785%	0.16313%	0.31570%	0.32626%
54	0.04524%	0.06096%	0.16588%	0.16764%	0.33176%	0.33528%
55 and older	0.04656%	0.06260%	0.17072%	0.17215%	0.34144%	0.34430%

Disability rates apply during the retirement eligibility period. Members are assumed to first receive disability benefits and then receive disability retirement annuity benefits.

For police officers, 50 percent of disabilities are assumed to occur in the line of duty and 50 percent of disabilities are assumed to be ordinary.

12. Operational Expenses

The amount of operational expenses for administration incurred in the latest fiscal year are supplied by SURS staff and incorporated in the normal cost. Estimated administrative expenses for FY 2026 and after are assumed to increase by 3.00%.

13. Spouse's Age

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

14. Missing Data

Members with an unknown gender are assumed to be female. Active and inactive members with an unknown date of birth are assumed to be 37 years old at the valuation date. An assumed spouse date of birth is calculated for current service retirees in the traditional plan for purposes of calculating future survivor benefits. The female spouse is assumed to be three years younger than the male spouse. Seventy percent of current total male retirees and 80% of current total female retirees in the traditional plan who have not elected a survivor refund are assumed to have a spouse at the valuation date.

15. Benefit Commencement Age

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

16. Load on Final Average Salary

No load is assumed to account for higher than assumed pay increases in final years of employment before retirement.

17. Load on Liabilities for Service Retirees with Non-finalized Benefits

A load of 10% on liabilities for service retirees whose benefits have not been finalized as of the valuation date is assumed to account for finalized benefits that on average are 10% higher than 100% of the preliminary estimated benefit. A load of 5% is used if a "best formula" benefit was provided in the data by Staff.

18. Valuation of Inactives

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

19. Reciprocal Service

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

20. Projection Assumptions

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

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

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

New entrants have an average age of 37.7 and average capped pay of \$53,935 and average uncapped pay of \$56,231 (2024 dollars). The new entrant data is based on the age at hire and assumed pay at hire (using the actuarial assumptions, inflated to 2024 dollars) of current active members with hire dates between July 1, 2020 and July 1, 2023.

Summary of New Entrants - Academic									
Age	Number Males	Average Pay		Number Females	Average Pay		Total Number	Average Pay	
		Capped Male	Uncapped Male		Capped Female	Uncapped Female		Capped Total	Uncapped Total
<20	0	\$0	\$0	0	\$0	\$0	0	\$0	\$0
20 - 24	76	35,153	35,153	69	33,517	33,517	145	34,375	34,375
25 - 29	215	45,339	46,292	323	46,881	47,618	538	46,265	47,088
30 - 34	443	65,808	72,026	593	59,432	63,826	1,036	62,159	67,332
35 - 39	411	67,730	75,144	482	58,164	62,579	893	62,567	68,362
40 - 44	278	63,167	70,400	360	53,328	56,579	638	57,615	62,602
45 - 49	192	52,414	58,196	262	51,526	56,760	454	51,902	57,367
50 - 54	139	54,767	60,409	192	49,158	52,607	331	51,513	55,883
55 - 59	123	55,464	67,999	143	50,213	56,381	266	52,641	61,753
60 - 64	102	40,156	50,915	73	41,082	43,815	175	40,543	47,954
65 - 69	11	37,338	46,790	7	48,224	67,672	18	41,572	54,911
Total	1,990	\$58,279	\$64,638	2,504	\$53,270	\$57,021	4,494	\$55,488	\$60,394

Summary of New Entrants – Non - Academic									
Age	Number Males	Average Pay		Number Females	Average Pay		Total Number	Average Pay	
		Capped Male	Uncapped Male		Capped Female	Uncapped Female		Capped Total	Uncapped Total
<20	25	\$30,661	\$30,661	34	\$28,751	\$28,751	59	\$29,560	\$29,560
20 - 24	600	40,307	40,318	1,005	39,467	39,467	1,605	39,781	39,785
25 - 29	1,316	51,215	51,230	2,103	49,337	49,360	3,419	50,060	50,080
30 - 34	1,103	56,161	57,680	1,594	55,010	55,563	2,697	55,481	56,429
35 - 39	731	63,086	66,279	1,208	55,187	56,258	1,939	58,164	60,036
40 - 44	623	64,997	67,570	1,000	55,243	56,926	1,623	58,987	61,012
45 - 49	458	63,417	68,363	788	54,930	57,149	1,246	58,049	61,271
50 - 54	450	61,675	65,412	708	54,660	58,025	1,158	57,386	60,895
55 - 59	322	58,656	62,447	519	52,186	55,034	841	54,663	57,872
60 - 64	183	56,777	66,199	242	51,204	53,446	425	53,604	58,937
65 - 69	12	72,002	87,187	10	58,152	60,322	22	65,706	74,975
Total	5,823	\$56,302	\$58,485	9,211	\$51,681	\$52,775	15,034	\$53,471	\$54,987

21. Retirement Savings Plan (RSP) Contribution Assumptions

The projected RSP contributions are equal to 7.6% of RSP payroll, plus estimated RSP expenses minus RSP employer forfeitures. Estimated RSP expenses for FY 2025 are \$1,304,401 and actual FY 2024 RSP employer forfeitures used to reduce the certified contributions for FY 2026 are \$7,903,822 (as provided by SURS). Estimated RSP expenses for FY 2026 and after are assumed to increase by 3.00%. Estimated RSP employer forfeitures used to reduce the certified contributions for FY 2027 and after are assumed to be 7.5% of the gross RSP employer contribution.

22. Pensionable Earnings Greater than 6%

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

23. Governor's Pay

The Governor's pay is \$216,000 as of June 30, 2024, and budgeted as of \$226,800 for fiscal year ending June 30, 2025, and is expected to increase each year by the assumed rate of Tier 2 capped payroll growth of 1.20%.

24. Buyout Election Assumption.

Zero percent of eligible Tier 1 active members are assumed to elect to receive a reduced and delayed AAI benefit at retirement and an accelerated pension benefit option in accordance with Public Act 100-0587 and 101-0010. Zero percent of eligible inactive members are assumed to elect to receive an accelerated pension benefit option in lieu of an annuity at retirement in accordance with Public Act 100-0587 and 101-0010.

25. Treatment of Benefits in Excess of the Internal Revenue Code Section 415 Limits.

The benefit amounts in excess of the IRC Section 415 limits for current retirees are paid through the Excess Benefit Arrangement (EBA) and are not reported in the actuarial valuation data. Therefore, the liabilities and the required contributions for these EBA benefits are not reflected in the actuarial valuation results. The amount of the estimated EBA payments for the upcoming fiscal year are provided by SURS Staff and included in the statutory contribution requirement.

State Employees' Retirement System

1. Interest Rate

6.75%, net of investment expenses

2. Inflation Rate

2.25%

3. Salary (Annual Compensation) Increase Assumption

The salary increase assumption consists of inflation (2.25%), real wage growth (0.50%) and merit or longevity increases that vary by age. Illustrative rates of increase per individual employee per annum, compounded annually are shown in the table below:

Age	Annual Increase
25	7.41%
30	6.29%
35	5.19%
40	4.36%
45	3.79%
50	3.38%
55	3.08%
60	2.84%
65	2.60%
70	2.50%
80+	2.25%

These increases include the wage inflation assumption of 2.75% comprised of an inflation assumption of 2.25% per annum and 0.50% per annum productivity or real wage growth assumption.

4. Cost of Living Adjustment Assumption

Benefits are increased annually as described on pages 59 through 69 of the draft June 30, 2024 Actuarial Valuation. Annual increases are 3% for those hired prior to January 1, 2011 and the lesser of 3% or ½ of the Consumer Price Index for those hired on or after January 1, 2011, which is 1.125% based on the inflation assumption of 2.25%.

5. Expenses

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

6. Mortality

Post-Retirement Mortality

The mortality assumption for general retirees is based on the Pub-2010 Below-Median Income General Healthy Retiree Mortality tables, sex distinct multiplied by 91% for males and 115% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales.

The mortality assumption for Public Safety retirees is based on the Pub-2010 Below-Median Income Public Safety Healthy Retiree Mortality tables, sex distinct, multiplied by 97% for males and 103% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales.

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

The mortality assumption for general active members is based on the Pub-2010 General Employee Mortality headcount-weighted tables, sex distinct, and multiplied by 84% for males and 92% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales.

The mortality assumption for Public Safety employees is based on the Pub-2010 Public Safety Healthy Employee Mortality headcount-weighted tables, sex distinct, multiplied by 90% for males and 100% for females. Generational mortality improvement is applied using the MP-2021 two-dimensional mortality improvement scales.

7. Termination

Assumed rates of withdrawal from the System for Tier 1 members are as follows:

Service (Beginning of Year)	Service Based Withdrawal			
	Regular Formula Employees		Alternate Formula Employees	
	Males	Females	Males	Females
0	0.2400	0.2200	0.0300	0.0700
1	0.0900	0.0900	0.0300	0.0700
2	0.0700	0.0550	0.0300	0.0650
3	0.0600	0.0550	0.0300	0.0600
4	0.0600	0.0450	0.0300	0.0600
5	0.0410	0.0400	0.0300	0.0500
6	0.0450	0.0350	0.0300	0.0400
7	0.0400	0.0350	0.0300	0.0300
8	0.0300	0.0350	0.0200	0.0200
9	0.0300	0.0350	0.0200	0.0200
10	0.0300	0.0300	0.0150	0.0200
11	0.0250	0.0300	0.0150	0.0175
12	0.0250	0.0250	0.0150	0.0175
13	0.0250	0.0250	0.0150	0.0175
14	0.0250	0.0250	0.0150	0.0175
15	0.0225	0.0250	0.0150	0.0175
16	0.0200	0.0200	0.0150	0.0150
17	0.0200	0.0200	0.0150	0.0150
18	0.0200	0.0200	0.0150	0.0150
19	0.0200	0.0200	0.0150	0.0125
20	0.0200	0.0175	0.0150	0.0125
21	0.0200	0.0175	0.0150	0.0125
22	0.0200	0.0175	0.0150	0.0125
23	0.0200	0.0175	0.0150	0.0125
24	0.0200	0.0175	0.0150	0.0100
25	0.0200	0.0150	0.0150	0.0100
26	0.0200	0.0150	0.0150	0.0100
27	0.0200	0.0150	0.0150	0.0100
28	0.0200	0.0150	0.0150	0.0100
29	0.0200	0.0150	0.0150	0.0100
30+	0.0200	0.0150	0.0150	0.0100

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.

Assumed rates of withdrawal from the System for Tier 2 members are as follows:

Service (Beginning of Year)	Service Based Withdrawal			
	Regular Formula Employees		Alternate Formula Employees	
	Males	Females	Males	Females
0	0.3300	0.2800	0.1000	0.1100
1	0.1650	0.1500	0.0800	0.0800
2	0.0600	0.0800	0.0625	0.0750
3	0.0600	0.0700	0.0550	0.0625
4	0.0575	0.0650	0.0425	0.0525
5	0.0500	0.0550	0.0300	0.0500
6	0.0450	0.0500	0.0250	0.0500
7	0.0450	0.0400	0.0225	0.0325
8	0.0300	0.0300	0.0150	0.0200
9	0.0300	0.0350	0.0150	0.0200
10	0.0300	0.0300	0.0150	0.0200
11	0.0250	0.0300	0.0150	0.0175
12	0.0250	0.0250	0.0150	0.0175
13	0.0250	0.0250	0.0150	0.0175
14	0.0200	0.0250	0.0150	0.0175
15	0.0200	0.0250	0.0150	0.0175
16	0.0200	0.0200	0.0150	0.0150
17	0.0200	0.0200	0.0150	0.0150
18	0.0200	0.0200	0.0150	0.0150
19	0.0200	0.0200	0.0150	0.0125
20	0.0250	0.0150	0.0150	0.0125
21	0.0250	0.0150	0.0150	0.0125
22	0.0250	0.0150	0.0150	0.0125
23	0.0250	0.0150	0.0150	0.0125
24	0.0200	0.0150	0.0150	0.0100
25	0.0200	0.0150	0.0150	0.0100
26	0.0200	0.0150	0.0150	0.0100
27	0.0200	0.0150	0.0150	0.0100
28	0.0200	0.0150	0.0150	0.0100
29	0.0200	0.0150	0.0150	0.0100
30+	0.0200	0.0150	0.0150	0.0100

8. Unused Sick Leave and Optional Service Purchases

Current and future active member's service is increased by 5.0 months to account for increases of service at retirement due to converting unused sick leave and vacation days and purchasing applicable optional service.

9. Marriage Assumption

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

10. Social Security Offset for Survivor Benefits

There is no offset assumption for male surviving spouses because it is assumed their own primary insurance amount (PIA) is as great as their spouses' PIA. 60% of married male members are assumed to have a dual income household. For the dual income household, it is assumed the offset at age 60 is 45.0% of the original survivor benefit. It is assumed the offset at age 62 is 10.0% of the original survivor benefit. Furthermore, it is assumed that 50% of retirees on or after July 1, 2009 will elect to remove the offset provision. In exchange for the removal, the member's retirement annuity is reduced by 3.825% monthly as mandated by Statutes (40 ILCS 5/14-121).

11. Disability

Because members who receive disability benefits typically spend less than one year on disability, they are considered active members. Therefore, a load of 1.31% of pay on the normal cost is applied to reflect the near-term cash flow. This assumption is based on 110% of the most recent disability benefit payment information as a percent of payroll and will be updated at each valuation date as experience emerges.

12. Retirement

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

Retirement Rates for Regular Formula Employees		
Age	Males	Females
50	15.00%	30.00%
51	24.00%	30.00%
52	24.00%	30.00%
53	24.00%	27.50%
54	24.00%	25.00%
55	24.00%	25.00%
56	18.00%	24.00%
57	18.00%	18.00%
58	18.00%	18.00%
59	18.00%	18.00%
60	13.00%	16.00%
61	12.00%	12.50%
62	19.00%	22.00%
63	16.50%	18.00%
64	16.50%	19.00%
65	22.50%	25.00%
66	22.50%	27.00%
67	22.50%	25.00%
68	22.50%	25.00%
69	22.50%	22.00%
70	22.50%	22.00%
71	20.00%	22.00%
72	20.00%	22.00%
73	20.00%	22.00%
74	20.00%	22.00%
75	100.00%	100.00%

Early Retirement Rates for Regular Formula Employees		
Age	Males	Females
55	3.50%	2.50%
56	3.50%	2.50%
57	3.50%	3.50%
58	6.00%	4.00%
59	6.50%	5.00%

Age	Retirement Rates for Alternative Formula Employees Eligible for Alternate Formula Benefits Only		Eligible for Regular Formula Benefits Only	
	Males	Females	Males	Females
50	60.00%	41.50%	N/A	N/A
51	50.00%	31.00%	N/A	N/A
52	35.00%	25.00%	N/A	N/A
53	35.00%	25.00%	N/A	N/A
54	35.00%	25.00%	N/A	N/A
55	40.00%	40.00%	N/A	N/A
56	30.00%	25.00%	N/A	N/A
57	25.00%	25.00%	N/A	N/A
58	27.00%	25.00%	N/A	N/A
59	27.00%	25.00%	N/A	N/A
60	30.00%	30.00%	4.00%	5.00%
61	30.00%	30.00%	4.00%	5.00%
62	30.00%	30.00%	8.00%	10.00%
63	35.00%	30.00%	10.00%	10.00%
64	35.00%	30.00%	11.00%	15.00%
65	35.00%	50.00%	14.00%	20.00%
66	40.00%	50.00%	25.00%	20.00%
67	40.00%	50.00%	20.00%	25.00%
68	45.00%	50.00%	17.50%	30.00%
69	45.00%	50.00%	17.50%	30.00%
70	50.00%	50.00%	17.50%	30.00%
71	50.00%	50.00%	17.50%	30.00%
72	100.00%	100.00%	100.00%	100.00%

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

Retirement Rates for Regular Formula Employees – Tier 2 Members			
Age	Employees Eligible for Normal Retirement	Age	Employees Eligible for Early Retirement
67	50.0%	62	30.0%
68	32.5%	63	15.0%
69	32.5%	64	15.0%
70	32.5%	65	15.0%
71	20.0%	66	15.0%
72	20.0%		
73	20.0%		
74	20.0%		
75	100.0%		

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

Retirement Rates for Alternative Formula Employees		
Age	Males	Females
60	50.0%	50.0%
61	25.0%	30.0%
62	25.0%	35.0%
63	30.0%	30.0%
64	30.0%	35.0%
65	30.0%	50.0%
66	30.0%	50.0%
67	30.0%	50.0%
68	30.0%	50.0%
69	40.0%	50.0%
70	45.0%	50.0%
71	45.0%	50.0%
72	100.0%	100.0%

13. Spouse's Age

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

14. Children

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

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

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

15. Overtime and Shift Differentials

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

16. Load for Inactive Members Eligible for Deferred Vested Pension Benefits

Load of 15% for Regular Formula members and 13% for Alternative Formula members to the liability attributable to inactive members eligible for deferred vested pension benefits for increase in final average salary due to participation in a reciprocal system after termination.

17. Missing Data

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

If a birth date was not available, the member was assumed to be age 35.

18. Decrement Timing

All decrements are assumed to occur mid-year.

19. Decrement Relativity

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

20. Decrement Operation

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

21. Eligibility Testing

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

22. 415(b) and 401(a)(17) Limits

No explicit assumption is made with respect to these items.

23. Buyout Election Assumption

In accordance with Public Act 100-0587, Public Act 101-0010 and Public Act 102-0718,

- Eligible Tier 1 active members may elect the “COLA Buyout”, through June 30, 2026, in which the member receives reduced and delayed COLA benefits at retirement and an accelerated pension benefit payment.
- Eligible inactive Tier 1 and Tier 2 members may elect the “Total Buyout”, through June 30, 2026, in which the member receives an accelerated pension benefit payment in lieu of an annuity at retirement.

With respect to the COLA Buyout, 20 percent of Regular Formula members, 45 percent of Alternative Formula members not covered by Social Security, and 40 percent of Alternative Formula members covered by Social Security, are assumed to elect the COLA Buyout. The election percentages are based on experience through June 2024 as provided by SERS. With respect to the Total Buyout, 3 percent are assumed to elect the Total Buyout. The election percentages apply until the end of each Buyout Program; i.e., June 30, 2026.

24. Population Projection

For purposes of determining annual appropriations as a percentage of total covered payroll, the size of the active group is assumed to remain level at the number of actives as of the valuation date. New entrants are assumed to enter with an average age and an average pay as disclosed below. New entrants are assumed to have the same demographic profile as actual new entrants over the 15 years prior to the valuation date. The average increase in uncapped payroll for the projection period is 2.75% per annum. New entrants not covered by Social Security are assumed to participate in the Tier 2 defined benefit plan.

Age Group	New Entrant Benefit Groups												Total	
	<i>Total Salaries in Thousands</i>													
	New Entrants Eligible for Regular Formula Covered by Social Security			New Entrants Eligible for Alternate Formula Covered by Social Security			New Entrants Formerly Eligible for Alternate Formula Benefits who are not Covered by Social Security and are now Eligible for Regular Formula Benefits			New Entrants Formerly Eligible for Alternate Formula Benefits who are now Eligible for Social Security				
	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary	No.	Salary
Under 20	172	7,252	174	9,437	9	479	357	26,461	2	95	355	17,168	5,620	304,327
20-24	3,122	151,375	1,910	113,157	228	13,188	479	37,903	1	59	8,260	494,359	8,260	494,359
25-29	5,403	303,839	2,089	133,363	288	19,195	277	22,746	1	85	6,783	439,469	6,783	439,469
30-34	5,018	313,342	1,230	84,347	224	16,740	93	7,968	1	85	5,464	373,890	5,464	373,890
35-39	4,326	288,864	821	60,318	224	16,740	93	7,968	1	85	5,464	373,890	5,464	373,890
40-44	4,159	289,229	658	50,462	189	15,324	54	4,787	2	95	5,062	359,943	5,062	359,943
45-49	3,555	250,010	465	35,861	165	13,411	29	2,482	1	59	4,216	301,922	4,216	301,922
50-54	3,015	213,195	296	22,459	119	9,681	51	4,707	1	59	3,494	251,078	3,494	251,078
55-59	1,949	132,183	154	11,465	60	4,638	26	2,549	1	59	2,192	151,088	2,192	151,088
60-64	724	48,616	56	4,132	18	1,179	2	241	1	59	801	54,247	801	54,247
65-69	62	3,654	3	206	6	415	3	206	1	59	71	4,275	71	4,275
70 & Over														
Total	31,505	2,001,559	7,856	525,207	1,563	113,200	1,368	109,843	4	239	42,318	2,751,766	42,318	2,751,766
Avg. Salary		63,531		66,854		72,425		80,295		59,651		65,026		65,026
Avg. Age		37.99		31.63		35.99		30.05		27.27		36.48		36.48
Percent Male		41%		72%		63%		90%		100%		49%		49%

Judges' Retirement System

1. Interest Rate

6.50%

2. Inflation Rate

2.25%

3. Salary Increases

2.50% compounded annually

The 2.50% salary increase assumption includes an inflation component of 2.25 percent per year, and a court differential pay component of 0.25 percent.

4. Cost of Living Adjustment Assumption

While Tier 1 members receive an annual automatic three percent COLA, Tier 2 members receive an annual increase equal to the lesser of the three percent received by Tier 1 and the annual change in the Consumer Price Index for all Urban Consumers. Tier 2 members are assumed to receive 2.25% COLA.

5. Capped Pay Assumption

The Tier 2 capped payroll growth is 2.25% per year, compounded annually, which is the inflation assumption.

6. Expenses

Expenses are expected to increase with the projected capped payroll at 2.25% and are included in the service cost.

7. 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.

8. Termination

Rates of withdrawal from the Plan are as follows:

Termination Rates - Tier 1		
Age	Males	Females
25-29	0.0159	0.0192
30-34	0.0159	0.0192
35-39	0.0159	0.0192
40-44	0.0158	0.0192
45-49	0.0139	0.0192
50-54	0.0114	0.0172
55-59	0.0093	0.0132
60-64	0.0082	0.0092
65+	0.0076	0.0068

Termination Rates - Tier 2		
	Males	Females
25-29	0.0200	0.0200
30-34	0.0200	0.0200
35-39	0.0191	0.0185
40-44	0.0176	0.0170
45-49	0.0161	0.0170
50-54	0.0146	0.0155
55-59	0.0137	0.0130
60-64	0.0137	0.0105
65-69	0.0137	0.0086
70-74	0.0137	0.0085
75+	0.0000	0.0000

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.

9. Retirement

Tier 1 Retirement rates were modified based on the 2021 Actuarial Experience Study for valuations beginning with the June 30, 2022 Actuarial Valuation.

Assumed retirement rates are as follows:

Retirement Rates – Tier 1		
	Males	Females
55-59	5.50%	8.50%
60-69	12.00%	12.00%
70-79	13.00%	13.00%
80+	100.00%	100.00%

Retirement Rates – Tier 2	
Age	Male & Female
62	11.00%
63	12.00%
64	13.00%
65	14.00%
66	14.00%
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%

Comment: Due to a lack of data on Tier 2 member retirements, GRS maintained the prior valuation's assumed rates. **We find the assumption and the basis for setting it reasonable.**

10. Disability

No assumption for disability was assumed.

11. 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.

12. Spouse's Age

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

13. New Entrants

The new entrant profile includes uncapped and capped salary information. New entrants are assumed to enter with an average age of 47.84, average uncapped pay of \$231,115, average capped pay of \$138,094, and with 61.07% male. The size of the active group is assumed to remain level at the number of actives as of the valuation date. The average increase in uncapped payroll for the projection period is 2.50% per annum. The average increase in capped payroll for the projection period is 2.25% percent per year.

14. Decrement Timing

All decrements are assumed to occur beginning of year.

15. Decrement Relativity

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

16. Decrement Operation

Turnover decrements do not operate after a member reaches retirement eligibility.

17. Eligibility Testing

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

18. Marriage Assumption

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

19. Employee Contribution Election

All judges are assumed to elect to contribute only on increases in salary when eligible for this provision.

20. 415(b) and 401(a)(17) Limits

No explicit assumption is made with respect to these items.

21. 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.

Age Group	Number	New Entrant Profile	
		Uncapped Salary	Capped Salary
30-34	16	\$ 3,926,873	\$ 2,209,496
35-39	100	23,316,446	13,809,350
40-44	202	46,621,203	27,894,887
45-49	225	151,850,388	31,071,038
50-54	162	37,433,150	22,371,147
55-59	123	28,233,328	16,985,500
60-64	60	13,852,977	8,285,612
65-69	6	1,382,842	828,561
Total	894	\$ 206,617,207	\$ 123,455,591
Average Salary		\$ 231,115	\$ 138,094
Average Age			47.84
Percent Male			61.07%

Other Assumptions as a result of Public Act 96-0889

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.

General Assembly Retirement System

1. Interest Rate

6.50%

2. Inflation Rate

2.25%

3. Salary Increases

2.50% compounded annually

The 2.50% salary increase assumption includes an inflation component of 2.25 percent per year, and a productivity/merit/promotion pay component of 0.25 percent.

4. Cost of Living Adjustment Assumption

While Tier 1 members receive an annual automatic three percent COLA, Tier 2 members receive an annual increase equal to the lesser of the three percent received by Tier 1 and the annual change in the Consumer Price Index for all Urban Consumers. Tier 2 members are assumed to receive 2.25% COLA.

5. Capped Pay Assumption

The Tier 2 capped payroll growth is 2.25% per year, compounded annually, which is the inflation assumption.

6. Expenses

Expenses are expected to increase with the projected capped payroll at 2.25% and are included in the service cost.

7. Mortality

Post-Retirement Mortality

The mortality basis was updated with the June 30, 2022 Actuarial Valuation and is based on the Pub-2010 Above-Median Income General Healthy Retiree Mortality tables, sex distinct, with no scaling factors, with generational mortality improvement using the MP-2021 two-dimensional mortality improvement scales.

Pre-Retirement Mortality

The mortality basis was updated with the June 30, 2022 Actuarial Valuation and is based on the Pub-2010 Above-Median Income General Employee Mortality tables, sex distinct, with no scaling factors and with generational mortality improvement using the MP-2021 two-dimensional mortality improvement scales.

Future mortality improvements are found by projecting the base mortality tables forward from the base year of 2010 using the MP-2021 mortality improvement scale.

8. Termination

Rates of withdrawal are assumed to be equal to seven percent for all ages 20 through 65 for both Tier 1 and Tier 2 members.

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.

9. Retirement

Retirement rates were increased at select ages for Tier 1 members based on the Actuarial Experience Study for valuations beginning with the June 30, 2022 Actuarial Valuation.

Rates of retirement for Tier 1 members are as follows:

Retirement Rates	
Age	Male and Female
55	10.00%
56-64	15.00%
65-69	20.00%
70-74	25.00%
75	100.00%

Rates of retirement for Tier 2 members are as follows:

Retirement Rates	
Age	Male and Female
62	20.00%
63	10.00%
64	12.00%
65	14.00%
66	16.00%
67	35.00%
68-70	25.00%
71-74	20.00%
75	100.00%

10. Deferred Vested Pension Benefits

Inactive deferred vested members are assumed to receive a deferred annuity at the time in which they reach Normal Retirement age and service requirements. If a member does not have at least four years (eight years for Tier 2) of credited service, it is assumed that the member will receive a refund of member contributions.

11. Marriage Assumption

75.0% of active and retired participants are assumed to be married.

12. Disability

No assumption for disability was assumed.

13. Population Projection

The new entrant profile includes uncapped and capped salary information. New entrants are assumed to enter with an average age as disclosed below. Based on the assumption that 45 percent of future members elect to opt-out of the pension system, the population is projected to decrease from 128 members as of the valuation date, to 76 members in 2045 and ultimately reach 71 members in 2056. The average increase in uncapped payroll for the projection period is 2.50% per annum.

Age Group	New Entrant Profile		
	No.	Uncapped Salary	Capped Salary
Under 20			
20-24	3	\$ 279,403	\$ 279,403
25-29	8	850,907	850,907
30-34	22	2,318,064	2,256,361
35-39	20	1,967,495	1,967,495
40-44	23	2,404,414	2,350,042
45-49	18	1,955,315	1,900,943
50-54	14	1,450,573	1,419,722
55-59	11	1,111,864	1,111,864
60-64			
65-69	1	100,903	100,903
70 & Over			
Total	120	\$ 12,438,938	\$ 12,237,640
Avg. Salary		\$ 103,658	\$ 101,980
Avg. Age			41.65
Percent Male			54.17%

The 2021 Actuarial Experience Study noted the 2021 opt-out experience was 40% which is in line with the current assumption of 45%. More historical experience would be helpful to compare the historical trend to the ongoing assumption. **In addition, we recommend GRS include annual opt-out data in the Active Membership table shown on page 11 of the Actuarial Valuation (Recommendation #5).**

14. Spouse's Age

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

15. Decrement Timing

All decrements are assumed to occur beginning of year.

16. Decrement Relativity

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

17. Decrement Operation

Turnover decrements do not operate after a member reaches retirement eligibility.

18. Eligibility Testing

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

19. 415(b) and 401(a)(17) Limits

No explicit assumption is made with respect to these items.

20. Other Assumptions as a result of Public Act 96-0889

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.

Chicago Teachers' Pension Fund

1. Interest Rate

6.50% per annum, compounded annually, net of investment expenses

2. Inflation Rate

2.25% per annum, compounded annually

3. Salary (Annual Compensation) Increase Assumption

Sample individual salaries are expected to increase as follows:

Age	Annual Increase
20	12.75%
25	7.25%
30	6.75%
35	6.00%
40	4.75%
45	4.25%
50	3.75%
55	3.75%
60	3.50%
65	3.25%
70	2.75%

Salary increase assumptions include the wage inflation assumption of 2.75% comprised of an inflation assumption of 2.25% per annum and 0.50% per annum productivity or real wage growth assumption.

4. Cost of Living Adjustment

For members hired before January 1, 2011, 3% per year as reflected in the benefit provisions. For members hired on or after January 1, 2011, 50% of assumed inflation, or 1.125% per year.

5. Tier 2 Capped Pay Assumption

Benefits for members hired after January 1, 2011 are calculated using pay that is capped under 40 ILCS 5/1-160. The pay cap increase assumption is 50% of assumed inflation, or 1.125% per year.

6. Mortality

Pre-Retirement Mortality

The Pub-2010 General Employee, sex distinct tables with 92% male adjustment and 122% female adjustment is used.

Post-Retirement Disability Mortality

The Pub-2010 Disabled Retiree, sex distinct tables with 100% male adjustment and 106% female adjustment is used.

Post-Retirement Healthy Mortality

The Pub-2010 General Healthy Retiree, sex distinct tables with 108% male adjustment and 105% female adjustment is used.

Future mortality improvements are reflected by projecting the base mortality tables from 2010 using the Society of Actuaries MP-2021 projection scale. This assumption provides generational mortality and includes a margin for future mortality improvements.

7. Disability

Disability rates, based on recent experience of the Fund, were applied to members with at least 10 years of service. All disabilities are assumed to be non-duty disabilities. Sample rates are as follows:

Age	Rate (%)
20	0.03%
25	0.03%
30	0.03%
35	0.04%
40	0.04%
45	0.06%
50	0.14%
55	0.19%
60	0.24%

8. Termination

Service-based termination rates were used. Select rates are as follows:

Termination			
Service (Beginning of Year)	Rate (%)	Service (Beginning of Year)	Rate (%)
0	31.00%	16	2.50%
1	15.00%	17	2.50%
2	12.00%	18	2.00%
3	11.00%	19	2.00%
4	9.00%	20	2.00%
5	9.00%	21	2.00%
6	8.00%	22	2.00%
7	6.00%	23	2.00%
8	6.00%	24	2.00%
9	5.00%	25	1.75%
10	4.00%	26	1.75%
11	3.00%	27	1.75%
12	3.00%	28	1.75%
13	3.00%	29	1.75%
14	3.00%	30	1.50%
15	3.00%	31 +	1.50%

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.

9. Retirement

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

Retirement Rates for Tier 1 Employees		
Age	<34 Years of Service Rate (%)	34+ Years of Service Rate (%)
55	5.00%	30.00%
56	5.00%	30.00%
57	6.00%	30.00%
58	6.00%	30.00%
59	7.00%	25.00%
60	15.00%	25.00%
61	15.00%	25.00%
62	15.00%	25.00%
63	15.00%	25.00%
64	15.00%	25.00%
65	17.50%	27.50%
66	17.50%	27.50%
67	17.50%	27.50%
68	18.00%	27.50%
69	18.00%	27.50%
70	18.00%	27.50%
71	18.00%	27.50%
72	18.00%	27.50%
73	18.00%	27.50%
74	18.00%	35.00%
75	100.00%	100.00%

Retirement Rates for Tier 2 Employees			
Age	Rate (%)	Age	Rate (%)
62	40.00%	69	27.50%
63	25.00%	70	27.50%
64	25.00%	71	27.50%
65	27.50%	72	27.50%
66	27.50%	73	27.50%
67	35.00%	74	35.00%
68	27.50%	75	100.00%

10. Active Member Population as of the Valuation Date

The Tier 2 active population as of the actuarial valuation date of June 30, 2024, was increased by 385 members in order to estimate the total expected number of active members that will be working and making contributions in the upcoming fiscal year. Members who retire at the end of the school year have June retirement dates and are already reflected as retirees in the data received as of June 30, but new active members to replace these members are not hired until August or September and are not included in the census data until the following fiscal year. These members are assumed to have a similar demographic profile as new entrants who have been hired in the last three years.

11. Expenses

Administrative expenses included in the normal cost for fiscal year 2025 are based on the budgeted administrative expense of \$27,986,716, as provided by Staff. Future administrative expenses are assumed to increase by 7.50 percent per year for 14 years and then increase at a rate consistent with the increase in projected capped payroll thereafter.

12. Marriage Assumption

70.0 percent of active male participants and 55.0 percent of active female participants are assumed to be married. Actual marital status at benefit commencement is used for retirees.

13. Spouse's Age

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

14. Total Service at Retirement

A teacher's total service credit at retirement is assumed to be 103.3 percent of the teacher's regular period of service at retirement.

15. Assumption for Missing Data

Members whose gender was not provided are assumed to be female.

16. Benefit Option

Retirees whose record includes a spouse date of birth are assumed to have the automatic 50% Joint and Survivor benefit. All other retirees are assumed to have a straight life benefit.

17. 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 including new hires, or 33,474. New entrants are assumed to enter with an average age and an average pay as disclosed below. New entrants are assumed to have a similar demographic profile of recent new entrants to the Fund. The average increase in uncapped payroll for the projection period is 2.75 percent per year.

New Entrant Profile		
Age Group	No.	Salary
Under 20	1	\$ 33,195
20-24	1,048	57,239,848
25-29	1,928	116,584,165
30-34	1,140	73,571,102
35-39	704	45,547,799
40-44	464	29,354,190
45-49	337	20,784,061
50-54	275	17,474,158
55-59	181	9,425,247
60-64	94	4,178,294
65-69	11	509,235
70 & Over		
Total	6,183	\$ 374,701,294
Avg. Salary		\$ 60,602
Avg. Age		33.10
Percent Female		74%

18. Contribution Timing

Projected employer contributions are assumed to occur based on the following timing:

1. Additional Board of Education Contribution (0.58 percent of pay) – June 30th (End of Year)
2. Additional State Contribution (0.544 percent of pay) – Monthly (Middle of Year)
3. State Normal Cost Contribution – Monthly (Middle of Year)
4. Board of Education Early Payment of Special Tax Levy – March 1st, annually
 - a. A portion of the prior year's tax levy is assumed to occur each March 1st
 - i. The payments made through March 31 (which are assumed to be paid on March 1 on average) as provided by CTPF is equal to \$307,945,495 for Fiscal Year 2024 and is assumed to increase three percent per year.
5. Remaining Board of Education Contribution – June 30th (End of Year)

19. Pay Increase Timing

Pay increases are assumed to occur at the beginning of the year.

20. Decrement Timing

All decrements are assumed to occur during the middle of the year.

21. Decrement Relativity

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

22. Decrement Operation

Turnover decrements do not operate after a member reaches retirement eligibility. Disability decrements do not operate after a member reaches normal retirement eligibility.

23. Eligibility Testing

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

24. Assumptions as a result of Public Act 96-0889

Members hired on or after January 1, 2011, are assumed to make contributions on salary up to the final average compensation cap in a given year.

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

Capped (pensionable) pay was \$125,774 for fiscal year 2024 and increases at $\frac{1}{2}$ the annual increase in the Consumer Price Index-U thereafter.

The annual increase in the Consumer Price Index-U is assumed to be 2.25 percent for all years.

Appendix D

Responses from the Retirement Systems

The responses from the Retirement Systems to the State Actuary's recommendations appear on the following pages:

TRS – pages 259-261

SURS – pages 262-265

SERS – pages 266-270

JRS – pages 271-275

GARS – pages 276-280

CTPF – pages 281-284

**TEACHERS' RETIREMENT SYSTEM OF THE STATE OF ILLINOIS**

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December 13, 2024

VIA ELECTRONIC MAIL

Mr. Joe Butcher

Office of the Auditor General

400 West Monroe, Suite 306

Springfield, IL 62704

Dear Mr. Butcher:

We reviewed the draft report prepared by the state actuary on the preliminary 2024 actuarial valuation prepared by Segal. TRS and Segal offer the following joint response to Cheiron's recommendations.

The TRS Board met on December 13, 2024 to provide final certification to the June 30, 2024 actuarial valuation report and the FY 2026 state funding requirements.

State Mandated Methods**1. Cheiron continues to recommend that the funding method be changed to employ a methodology that produces a reasonable actuarially determined contribution and fully funds plan benefits within a reasonable period. (Recommendation #1)**

We agree that the current funding methodology does not follow the Actuarial Standards of Practice (ASOPs). The TRS Board consistently expresses concerns over inadequate funding and, in 2012, began certifying alternative state funding requirements that do conform to actuarial standards. Cheiron confirms that the alternative funding method used by the Board conforms to the requirements of a reasonable actuarially determined contribution that fully funds plan benefits within a reasonable period, though notes that the FY 2026 contribution requirement under this alternative funding method of over \$10 billion may not be "plausible" from a State budgeting standpoint. If the TRS Board so desires, Segal can further review with them the current Board-Adopted Funding Policy and outline possible modifications within model practice that may yield a contribution that would be more "plausible" (including defining parameters for plausibility, as its definition is rather subjective) for the State to contribute (in addition to targeting a 100% funded percentage within a reasonable period). Cheiron confirms that the current Board-adopted Actuarial Funding Policy targets full funding after 20 years and is considered actuarially sound.

2. Cheiron recommends the phase-in period for the impact of assumption changes be reduced to no longer than three years since experience studies are performed every three years. (Recommendation #2)

We agree that the current phase-in period should be reduced from five years to three years based on the required time between experience studies. However, the phase-in period is determined in Public Act 100-0023 and is under the jurisdiction of State law rather than TRS.

Recommended Changes for the 2024 Valuation

- 3. Cheiron recommends that Segal include an assessment for “Economic and Other Related Risks” and “Longevity Risk” identified as a key risk per section 3.3 of ASOP 51. (Recommendation #3)**

Segal will include additional language in the final version of the 2024 valuation report to provide a risk assessment of the “Economic and Other Related Risks” and “Longevity Risk” pertaining to TRS.

- 4. Cheiron recommends that Segal disclose how long before the state mandated contribution is expected to exceed the normal cost plus interest on the unfunded actuarial accrued liability and disclose whether the funding policy is significantly inconsistent with asset accumulation necessary for benefit payments per section 3.19 of ASOP 4. (Recommendation #4)**

Segal agrees with Cheiron’s recommendation and will include these additional disclosures in the final version of the 2024 valuation report.

Recommended Changes for Future Valuations

- 5. Cheiron recommends that Segal provide additional information in the valuation report about the projected demographics of the active population used in its projection such as the average age and service of the active population in each year of the projection. (Recommendation #5)**

Segal will consider including additional information about the average age and service of the projected active population in each year of the projection for future actuarial valuation reports.

- 6. Cheiron recommends that the TRS Board continue to annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work and adjust assumptions accordingly, as they did for this valuation. (Recommendation #6)**

Since 2013, the TRS actuaries have reviewed the interest and inflation assumptions annually and will continue to do so.

- 7. Cheiron recommends that Segal includes additional detail (e.g., exposures, actual experience, and expected experience) by the relevant age and/or service buckets throughout their experience study, similar to what was shown in the 2021 experience study report. (Recommendation #7)**

Segal will include additional detail by the relevant age and/or service buckets in the forthcoming 2024 experience study report.

8. Cheiron requests a rationale for the significant expected increase in administrative expenses compared to the most recent actual administrative expenses. (Recommendation #8)

TRS administrative expenses are increasing due to building upgrades, technology initiatives such as pension administration system modernization, and a significant staff increase.

Thank you for Cheiron's thorough review of Segal's work. We appreciate their focus on the substantial risks caused by eight decades of TRS underfunding. Please let us know if you or Cheiron would like to discuss any of these issues.

Sincerely,

SIGNED ORIGINAL ON FILE

R. Stanley Rupnik
Executive Director and Chief Investment Officer

cc: Amy Reynolds, TRS
Dennis Gibbons, OAG
Heather Powell, Forvis Mazars
Bill Hallmark, Cheiron
Coralie Taylor, Cheiron
Gene Kalwarski, Cheiron
Jake Libauskas, Cheiron
Christian Benjaminson,
CheironHeath Merlak, Cheiron
Matt Wells, Cheiron
Michael Noble, Cheiron
Jana Bowers, Cheiron
Janet Cranna, Cheiron
Matt Strom, Segal
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December 11, 2024

Mr. Frank J. Mautino
 Auditor General
 400 West Monroe, Suite 306
 Springfield, IL 62704

Re: Response to the State Actuary's Report on the SURS June 30, 2024 Actuarial Valuation

Dear General Mautino:

This is the official response from the State Universities Retirement System of Illinois (SURS) regarding the December 2024 preliminary report issued by Cheiron – The State Actuary's Preliminary Report on the State Universities Retirement System of Illinois Pursuant to 30 ILCS 5/2-8.1.

What follows is a summary response to each of the recommendations. We have also enclosed a detailed response letter from our actuary, Gabriel Roeder Smith & Company (GRS).

Proposed Certification of the Required State Contribution

The State Actuary accepts the preliminary proposed certification of \$2,324,013,000 for the fiscal year 2026 SURS required state contribution.

Assessment of Actuarial Assumptions Used in the 2024 Valuation

The December 2024 report issued by the State Actuary, Cheiron, indicates that they believe that the assumptions used in the June 30, 2024, Actuarial Valuation are reasonable.

State Mandated Funding Method

- 1. The State Actuary expressed their concern regarding the Statutory funding method and recommends that the Statutory funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution (ADC) and fully funds plan benefits within a reasonable period.**

Response: The funding policy is established by the legislature and is not under the control of the Board. Please note that prior annual valuation reports and the certification letters sent to the State have addressed this concern and we plan to do so again in this year's communication.

- 2. Public Act 100-0023 (P.A. 100-0023), effective July 6, 2017, modified the State's funding policy to require that the contribution impact of all assumptions changes be phased-in over a five-year period. Because experience studies are performed every three years, the State Actuary recommends that the phase-in period of the impact of assumption changes be reduced to three years.**

Response: The funding policy is established by the legislature and is not under the control of the Board. GRS recommends eliminating the phase-in period.

Recommended Changes for Future Valuations

- Cheiron recommends that the Board continue to annually review the economic assumptions (interest rate and inflation) each year prior to commencing the valuation work and adjust assumptions accordingly, as they did for this valuation.**

Response: GRS performed an experience study using the June 30, 2020 – June 30, 2023 data and presented their findings to the Board at the June 2024 Board meeting. The updated assumptions were implemented in the June 30, 2024 actuarial valuation. GRS will continue to perform a review of the inflation and investment return assumptions prior to any actuarial valuations done in non-experience study years.

Stress Testing

GRS will continue to include stress testing of the System within the final valuation report. The stress testing was not included in the preliminary report but was provided to Cheiron in a separate letter dated November 21, 2024. The letter is also included in Appendix J of the final June 20, 2024, Actuarial Valuation.

During our review of the preliminary report issued by Cheiron, we noticed that the inflation assumption was incorrectly listed as 2.25% at the top of page 12. It appears to be correct throughout the rest of the report.

Please do not hesitate to contact me with any questions or concerns about our response.

Sincerely yours,

SIGNED ORIGINAL ON FILE

Suzanne M. Mayer
Executive Director

Encl: Gabriel Roeder Smith & Company Response to State Actuary Report of 2024
Actuarial Valuation Report Fiscal Year 2024 (Final)

cc: Michael Noble, Cheiron
Joe Butcher, Office of the Auditor General
Bill Sarb, RSM US LLP



December 3, 2024

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

Re: Response to State Actuary's Preliminary Report on the SURS June 30, 2024 Actuarial Valuation

Dear Members of the Board:

At your request, we have reviewed the report issued by Cheiron dated November 26, 2024 – The State Actuary's Preliminary Report on the State Universities Retirement System of Illinois ("SURS") Pursuant to 30 ILCS 5/2-8.1. This report consists of a review of the June 30, 2024 actuarial valuation of SURS prepared by Gabriel, Roeder, Smith & Company ("GRS").

Assessment of Actuarial Assumptions and Methods Used in the 2024 Valuation

This report issued by the State Actuary, Cheiron, indicates that **"In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law. We note that the history of inadequate funding has resulted in current and future contribution levels, measured as a percentage of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging."**

Proposed Certification of the Required State Contribution

In this section, the State Actuary notes that they have verified the arithmetic accuracy of the required State contribution calculated by GRS and the assumptions on which it was based, and accepted the GRS projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions.

State Mandated Funding Method

In this section, the State Actuary opines on their concern regarding the Statutory funding method and recommends that the Statutory funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution (ADC) and fully funds plan benefits within a reasonable period. In addition, they state "The State Mandated Method is entering a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount." **(Recommendation #1)**

The funding method used in the June 30, 2024 actuarial valuation of SURS is prescribed in accordance with Article 15 of the Illinois Pension Code (as noted by Cheiron) and is not under the actuary or the Board's control; therefore, no action is required in the actuarial valuation report.

Board of Trustees
 State Universities Retirement System of Illinois
 December 3, 2024
 Page 2

GRS has prepared projections, at the request of SURS staff, that illustrate projected contributions based on funding policy changes from legislative proposals and additional alternate policies in order to illustrate potential policies that better manage volatility and may not produce contribution requirements that differ significantly from the current Statutory policy. In addition, we encourage Cheiron, in their role as the State Actuary, to also address this issue directly with the State of Illinois.

The State Actuary recommends that the phase-in of the contribution impact of assumption changes be reduced from five years to no longer than three years (since experience studies are performed every three years). (**Recommendation #2**)

The funding method used in the June 30, 2024 actuarial valuation of SURS is prescribed in accordance with Article 15 of the Illinois Pension Code (as noted by Cheiron) and is not under the actuary or the Board's control; therefore, no action is required. In our annual actuarial valuation reports, we have recommended eliminating the phase-in of the contribution impact of assumption changes.

Recommended Changes for Future Valuations

Recommendation #3 is that the Board continue to annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work and adjust assumptions accordingly.

We have performed a review of the inflation and investment return assumptions prior to each annual actuarial valuation since this recommendation was first made. We performed a full experience study prior to the June 30, 2024 valuation, which included a review of the inflation and investment return assumptions.

GASB Statement Nos. 67 and 68

Cheiron indicates, "We find that the assumptions and methods used to prepare the 2024 SURS GASB 67 and 68 schedules are reasonable based on the evidence provided to us."

We look forward to continuing to work with the Board to improve the funding of SURS and communicating and helping manage risks that SURS may face.

Sincerely,
 Gabriel, Roeder, Smith & Company

SIGNED ORIGINAL ON FILE

Amy Williams, ASA, EA, MAAA, FCA
 Senior Consultant

SIGNED ORIGINAL ON FILE

Mark Buis, FSA, EA, MAAA, FCA
 Senior Consultant

SIGNED ORIGINAL ON FILE

Kevin Noelke, ASA, MAAA, FCA
 Consultant

cc: Suzanne Mayer, SURS
 Tara Myers, SURS
 Kristen Brundirks, GRS
 Brian Murphy



December 10, 2024

Mr. Joe Butcher
Office of the Auditor General
400 West Monroe, Suite 306
Springfield, IL 62704

Dear Mr. Butcher,

The management of the State Employees' Retirement System (SERS) has reviewed the State Actuary's preliminary report on the draft SERS June 30, 2024 Actuarial Valuation, prepared by Gabriel, Roeder, Smith and Company (GRS). The report notes the State Actuary (Cheiron) believes **"the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable."** In addition, Cheiron found **"the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law."**

Cheiron also provides **"that the history of inadequate funding has resulted in current and future contribution levels, measured as a percent of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging."**

Listed are Cheiron's recommendations and SERS management's responses to those recommendations. In addition, attached are the GRS responses to the recommendations.

State Mandated Funding Method

- 1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.**

Response: The SERS Board of Trustees agrees with the recommendation and in 2015 adopted a funding policy that provides for annual State contributions equal to the projected normal cost of benefits earned in a year plus an amount to amortize the unfunded liabilities over 25 years as a level percent of payroll. This amount is considered the "Actuarially Determined Contribution" (ADC) and for informational purposes is included in the actuarial valuation and the annual certifications of the required State contribution.

- 2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than**

three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.

Response: The SERS Board of Trustees agrees with the recommendation.

Recommended Changes for Future Valuations

- 3. We recommend the SERS Board continue to annually review the economic assumptions (interest rate, inflation and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.**

Response: The Board of Trustees will continue to annually review all economic assumptions in a timely manner so adjustments in assumptions will be included in the next valuation.

- 4. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.**

Response: SERS staff defers to GRS to respond to this recommendation.

Please let me know if you would like to further discuss your recommendations or our responses.

Sincerely,

SIGNED ORIGINAL ON FILE

Timothy B. Blair, Executive Secretary
State Employees' Retirement System



December 10, 2024

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

Re: Response to State Actuary Report of 2024 — SERS

Dear Members of the Board:

At your request, we have reviewed the report issued by Cheiron – The State Actuary's Preliminary Report on the State Employees' Retirement System of Illinois ("SERS") Pursuant to 30 ILCS 5/2-8.1. This report contains a review of the June 30, 2024, actuarial valuation for SERS.

Assessment of Actuarial Assumptions and Methods Used in the 2024 Valuation

The report issued by the State Actuary, Cheiron, indicates that **"In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law."**

Page 1 of the transmittal letter of the draft GRS Actuarial Valuation report states:

The System's current contribution rate determined under the statutory funding policy may not conform to the Actuarial Standards of Practice. Therefore, the Board adopted an actuarial funding policy to be used to calculate the Actuarially Determined Contribution ("ADC") under GASB Statement Nos. 67 and 68 for financial reporting purposes.

Although the statutory contribution requirements were met, the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution. Meeting the statutory requirement does not mean that the undersigned agree that adequate actuarial funding has been achieved. We recommend the adherence to a funding policy, such as the Board policy used to calculate the ADC under GASB Statement Nos. 67 and 68, that funds the normal cost of the plan as well as an amortization payment that seeks to pay off any unfunded accrued liability over a closed period of 25 years.

Board of Trustees
State Employees' Retirement System of Illinois
December 10, 2024
Page 2

State Mandated Funding Method

In **item 1**, the State Actuary recommends that: "the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period. The State Mandated Method will soon enter a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the plan is ultimately 100% funded within a reasonable period."

We agree with the State Actuary's comment on strengthening SERS' funding policy. As stated on the prior page, a funding policy that finances the normal cost plus the unfunded actuarial liability over a 25-year closed period would, in our opinion, strengthen the funded status of SERS. However, a change in the funding method and funding policy would require a statutory change.

In **item 2**, the State Actuary recommends that the phase-in period for the impact of assumption changes be reduced to three years since experience studies are performed every three years.

The funding method used in the June 30, 2024, actuarial valuation is prescribed in accordance with Public Act 100-0023 and is not under the actuary or the Board's control; therefore, no action is required. However, we agree with the State Actuary's recommendation.

Recommended Changes for Future Valuations

In **item 3**, the State Actuary recommends that SERS annually review the economic assumptions prior to commencing the valuation work, and adjust assumptions accordingly.

We agree with the State Actuary's recommendation and will continue to provide the SERS Board, on an annual basis, with information necessary to evaluate all economic assumptions, prior to commencing the valuation process.

In **item 4**, the State Actuary recommends GRS disclose more information about the survey data used in our analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

We will consider adding more information concerning the survey participants and the effective date of the capital market assumptions in our next analysis.

Board of Trustees
State Employees' Retirement System of Illinois
December 10, 2024
Page 3

Respectfully submitted,

Gabriel, Roeder, Smith & Company

SIGNED ORIGINAL ON FILE

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

SIGNED ORIGINAL ON FILE

Heidi Barry, ASA, FCA, MAAA
Senior Consultant

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Jeff Tebeau, FSA, EA, FCA, MAAA
Senior Consultant



srs.illinois.gov

December 10, 2024

Mr. Joe Butcher
Office of the Auditor General
400 West Monroe, Suite 306
Springfield, IL 62704

Dear Mr. Butcher,

The management of the Judges' Retirement System (JRS) has reviewed the State Actuary's preliminary report on the draft JRS June 30, 2024 Actuarial Valuation, prepared by Gabriel, Roeder, Smith and Company (GRS). The report notes the State Actuary (Cheiron) believes **"the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable."** In addition, Cheiron found **"the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law."**

Cheiron also provides **"that the history of inadequate funding has resulted in current and future contribution levels, measured as a percent of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging."**

Listed are Cheiron's recommendations and JRS management's responses to those recommendations. In addition, attached are the GRS responses to the recommendations.

State Mandated Funding Method

- 1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.**

Response: The JRS Board of Trustees agrees with recommendation and in 2015 adopted a funding policy that provides for annual State contributions equal to the projected normal cost of benefits earned in a year plus an amount to amortize the unfunded liabilities over 25 years as a level percent of payroll. This amount is considered the "Actuarially Determined Contribution" (ADC) and for informational purposes is included in the actuarial valuation and the annual certifications of the required State contribution.

- 2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.**

Response: The JRS Board of Trustees agrees with the recommendation.

Recommended Changes for Future Valuations

- 3. We recommend the JRS Board continue to annually review the economic assumptions (interest rate, inflation and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.**

Response: The Board of Trustees will continue to annually review the economic assumptions in a timely manner so adjustments to the assumptions will be included in the next valuation.

- 4. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.**

Response: JRS staff defers to GRS to respond to this recommendation.

Please let me know if you would like to further discuss your recommendations or our responses.

Sincerely,

SIGNED ORIGINAL ON FILE

Timothy B. Blair, Executive
SecretaryJudges' Retirement
System



December 10, 2024

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

Re: Response to State Actuary Report of 2024 — JRS

Dear Members of the Board:

At your request, we have reviewed the report issued by Cheiron – The State Actuary's Preliminary Report on the Judges' Retirement System of Illinois ("JRS") Pursuant to 30 ILCS 5/2-8. This report contains a review of the June 30, 2024, actuarial valuation for JRS.

Assessment of Actuarial Assumptions and Methods Used in the 2024 Valuation

The report issued by the State Actuary, Cheiron, indicates that **"In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law."**

Page 1 of the transmittal letter of the draft GRS Actuarial Valuation report states:

The System's current contribution rate determined under the statutory funding policy may not conform to the Actuarial Standards of Practice. Therefore, the Board adopted an actuarial funding policy to be used to calculate the Actuarially Determined Contribution ("ADC") under GASB Statement Nos. 67 and 68 for financial reporting purposes.

Although the statutory contribution requirements were met, the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution. Meeting the statutory requirement does not mean that the undersigned agree that adequate actuarial funding has been achieved. We recommend the adherence to a funding policy, such as the Board policy used to calculate the ADC under GASB Statement Nos. 67 and 68, that funds the normal cost of the plan as well as an amortization payment that seeks to pay off any unfunded accrued liability over a closed period of 25 years.

Board of Trustees
Judges' Retirement System of Illinois
December 10, 2024
Page 2

State Mandated Funding Method

In **item 1**, the State Actuary recommends that: "the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period. The State Mandated Method is entering a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the plan is ultimately 100% funded within a reasonable period."

We agree with the State Actuary's comment on strengthening JRS' funding policy. As stated above, a funding policy that finances the normal cost plus the unfunded actuarial liability over a 25-year closed period would, in our opinion, strengthen the funded status of JRS. However, a change in the funding method and funding policy would require a statutory change.

In **item 2**, the State Actuary recommends that the phase-in period for the impact of assumption changes be reduced to three years since experience studies are performed every three years.

The funding method used in the June 30, 2024, actuarial valuation is prescribed in accordance with Public Act 100-0023 and is not under the actuary or the Board's control; therefore, no action is required. However, we agree with the State Actuary's recommendation.

Recommended Changes for Future Valuations

In **item 3**, the State Actuary recommends that JRS annually review the economic assumptions prior to commencing the valuation work, and adjust assumptions accordingly.

We agree with the State Actuary's recommendation and will continue to provide the JRS Board, on an annual basis, with information necessary to evaluate all economic assumptions, prior to commencing the valuation process.

In **item 4**, the State Actuary recommends GRS disclose more information about the survey data used in our analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

We will consider adding more information concerning the survey participants and the effective date of the capital market assumptions in our next analysis.

Board of Trustees
Judges' Retirement System of Illinois
December 10, 2024
Page 3

Respectfully submitted,

Gabriel, Roeder, Smith & Company

SIGNED ORIGINAL ON FILE

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

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

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



December 10, 2024

Mr. Joe Butcher
Office of the Auditor
General400 West Monroe,
Suite 306
Springfield, IL 62704

Dear Mr. Butcher,

The management of the General Assembly Retirement System (GARS) has reviewed the State Actuary's preliminary report on the draft GARS June 30, 2024 Actuarial Valuation, prepared by Gabriel, Roeder, Smith and Company (GRS). The report notes the State Actuary (Cheiron) believes **"the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable."** In addition, Cheiron found **"the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law."**

Cheiron also provides **"that the history of inadequate funding has resulted in current and future contribution levels, measured as a percent of payroll, to be among the highest in the country. Making adequate contributions in the future to fully fund the system will be challenging."**

Listed are Cheiron's recommendations and GARS management's responses to those recommendations. In addition, attached are the GRS responses to the recommendations.

State Mandated Funding Method

- 1. We recommend that the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully funds plan benefits within a reasonable period.**

Response: The GARS Board of Trustees agrees with recommendation and in 2015 adopted a funding policy that provides for annual State contributions equal to the projected normal cost of benefits earned in a year plus an amount to amortize the unfunded liabilities over 20 years as a level percent of payroll. This amount is considered the "Actuarially Determined Contribution" (ADC) and for informational purposes is included in the actuarial valuation and the annual certifications of the required State contribution.

- 2. Because experience studies are performed every three years, we recommend that the phase-in period for the impact of assumption changes be reduced to no longer than three years. However, we understand that changing the funding method is under the jurisdiction of State law and not the Retirement System.**

Response: The GARS Board of Trustees agrees with the recommendation.

Recommended Changes for Future Valuations

- 3. We recommend the GARS Board continue to annually review the economic assumptions (interest rate, inflation and salary increases), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.**

Response: The Board of Trustees will continue to annually review all economic assumptions in a timely manner so adjustments in assumptions will be included in the next valuation.

- 4. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.**

Response: GARS staff defers to GRS to respond to this recommendation.

- 5. We recommend that GRS include annual opt-out data in the Active Membership table shown on page 11 of the Actuarial Valuation.**

Response: GARS staff defers to GRS to respond to this recommendation.

Please let me know if you would like to further discuss your recommendations or our responses.

Sincerely,

SIGNED ORIGINAL ON FILE

Timothy B. Blair, Executive Secretary
General Assembly Retirement System



December 10, 2024

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

Re: Response to State Actuary Report of 2024 — GARS

Dear Members of the Board:

At your request, we have reviewed the report issued by Cheiron – The State Actuary's Preliminary Report on the General Assembly Retirement System of Illinois ("GARS") Pursuant to 30 ILCS 5/2-8.1. This report contains a review of the June 30, 2024, actuarial valuation for GARS.

Assessment of Actuarial Assumptions and Methods Used in the 2024 Valuation

This report issued by the State Actuary, Cheiron, indicates that **"In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified contributions, notwithstanding the inadequate State funding requirements that do not conform to generally accepted actuarial principles and practices, were properly calculated in accordance with State law."**

Page 1 of the transmittal letter of the draft GRS Actuarial Valuation report states:

The System's current contribution rate determined under the statutory funding policy may not conform to the Actuarial Standards of Practice. Therefore, the Board adopted an actuarial funding policy to be used to calculate the Actuarially Determined Contribution ("ADC") under GASB Statement Nos. 67 and 68 for financial reporting purposes.

Although the statutory contribution requirements were met, the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution. Meeting the statutory requirement does not mean that the undersigned agree that adequate actuarial funding has been achieved. We recommend the adherence to a funding policy, such as the Board policy used to calculate the ADC under GASB Statement Nos. 67 and 68, that funds the normal cost of the plan as well as an amortization payment that seeks to pay off any unfunded accrued liability over a closed period of 20 years.

Board of Trustees
General Assembly Retirement System of Illinois
December 10, 2024
Page 2

State Mandated Funding Method

In **item 1**, the State Actuary recommends that: “the funding method be changed to employ a methodology that produces a Reasonable Actuarially Determined Contribution and fully fund plan benefits within a reasonable period. The State Mandated Method is entering a period in which the contribution amount it produces may be reasonable even though the overall methodology is not. This period offers an opportunity to change the methodology to one that is consistent with actuarial standards for a Reasonable Actuarially Determined Contribution (ADC) without significantly affecting the immediate contribution amount. Such a method would set contributions at a level that is expected to prevent the Unfunded Actuarial Liability from growing and remain high enough to reduce the Unfunded Actuarial Liability each year until the Plan is ultimately 100% funded within a reasonable period.”

We agree with the State Actuary’s comment on strengthening GARS funding policy. As stated above, a funding policy that finances the normal cost plus the unfunded actuarial liability over a 20-year closed period would, in our opinion, strengthen the funded status of GARS. However, a change in the funding method and funding policy would require a statutory change.

In **item 2**, the State Actuary recommends that the phase-in period for the impact of assumption changes be reduced to three years since experience studies are performed every three years.

The funding method used in the June 30, 2024, actuarial valuation is prescribed in accordance with Public Act 100-0023 and is not under the actuary or the Board’s control; therefore, no action is required. However, we agree with the State Actuary’s recommendation.

Recommended Changes for Future Valuations

In **item 3**, the State Actuary recommends that GARS annually review the economic assumptions prior to commencing the valuation work, and adjust assumptions accordingly.

We agree with the State Actuary’s recommendation and will continue to provide the GARS Board, on an annual basis, with information necessary to evaluate all economic assumptions, prior to commencing the valuation process.

In **item 4**, the State Actuary recommends GRS disclose more information about the survey data used in our analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

We will consider adding more information concerning the survey participants and the effective date of the capital market assumptions in our next analysis.

Board of Trustees
General Assembly Retirement System of Illinois
December 10, 2024
Page 3

In **item 5**, the State Actuary recommends that GRS “include annual opt-out data in the Active Membership table shown on page 11 of the Actuarial Valuation.”

We will consider adding the opt-out information for the 2025 actuarial valuation report, as appropriate, and if the data is readily available.

Respectfully submitted,

Gabriel, Roeder, Smith & Company

SIGNED ORIGINAL ON FILE

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

SIGNED ORIGINAL ON FILE

Heidi Barry, ASA, FCA, MAAA
Senior Consultant

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Jeff Tebeau, FSA, EA, FCA, MAAA
Senior Consultant



425 S. Financial Place, Suite 1400 | Chicago, IL 60605-1000

December 10, 2024

Mr. Frank Mautino
Auditor General
400 W. Monroe – Suite 306
Springfield, Illinois 62704

Mr. Joe Butcher
Audit Manager
Illinois Office of the Auditor General
400 W. Monroe-Suite 306
Springfield, Illinois 62704

Mr. Gene Kalwarski
Principal Consulting Actuary
Inc.
230 West Monroe Street, Suite 650
Chicago, Illinois 60606

Mr. Mike Noble
Principal Consulting Actuary
Cheiron, Inc.
230 West Monroe, Suite 650
Chicago, Illinois 60606

RE: Response to the State Actuary's Draft Preliminary Report on the Public School Teachers' Pension and Retirement Fund of Chicago Pursuant to Illinois Public Act 100-0465 Regarding Gabriel, Roeder, Smith & Company's Draft June 30, 2024 Actuarial Valuation

This letter and attachment from Gabriel, Roeder, Smith & Company ("GRS") serves as formal notice of the response of the Public School Teachers' Pension and Retirement Fund of Chicago ("CTPF" or the "Fund") to the State Actuary's Draft "Preliminary Report on the Public School Teachers' Pension and Retirement Fund of Chicago Pursuant to Illinois Public Act 100-0465 Regarding Gabriel, Roeder, Smith & Company's Draft June 30, 2024 Actuarial Valuation.

The State Actuary's Recommendations and Report Comment are set out, below:

1. We recommend the CTPF Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.
2. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

Report Comment for CTPF Consideration:

1. Actuarial Cost Method

The System uses the projected unit credit cost method (PUC) to assign costs to years of service, as required under the Pension Code (40 ILCS 5/17). We have no objections with respect to using the PUC method, although we, as GRS does, would prefer the Entry Age Normal (EAN) cost method as it is more consistent with the requirement in 40 ILCS 5/17-129 for level percent of pay funding.

Under the PUC method, which is used by some public sector pension funds, the benefits of active participants are calculated based on their compensation projected with assumed annual increases to ages at which they are assumed to leave the active workforce by any of these causes: retirement, disability, turnover, or death. Only past service (through the valuation date but not beyond) is taken into account in calculating these benefits. The present value of these benefits based on past service and future compensation is the Actuarial Liability for a given active participant. Under the PUC cost method, the value of an active participant's benefits tends to increase more sharply over his or her later years of service than over his or her earlier ones. As a result of this pattern of benefit value increasing, while the PUC method is not an unreasonable method, more plans use the EAN cost method to mitigate this effect. It should also be noted that the EAN cost method is the required method to calculate liability for GASB Nos. 67 and 68.

While there is concern over the mandated funding method conforming to generally acceptable actuarial principles and practices, the State's obligation to fund CTPF is limited to payment of the future normal cost plus expenses and a health care subsidy. Consequently, we have not reviewed the asset valuation method, the amortization method, or the projection of the Unfunded Actuarial Liability.

The two recommendations of the report will be approved by the CTPF Board of Trustees at the January 16, 2025, Board of Trustees meeting. The Board and GRS will continue to annually review the economic assumptions (interest rate and inflation) utilized in the valuation report prior to the preparation of the report and adjust them accordingly. In future economic assumption studies GRS will disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received. In addition, as to the Report Comment, the CTPF Board appreciates and supports the effort by the State Actuary to improve the financial condition of the Fund as demonstrated by the call for using a more appropriate statutory actuarial cost method.

If you have any questions, please do not hesitate to contact me at 312-332-3338.

Best regards,

SIGNED ORIGINAL ON FILE

Carlton W. Lenoir Sr.
Executive Director

Enclosure
Cc: (with enclosure)

Alex Rivera – GRS, CTPF Actuary
Alise White – CTPF, Chief Financial Officer
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December 9, 2024

Board of Trustees
Public School Teachers' Pension and Retirement
Fund of Chicago
425 South Financial Place, Suite 1400
Chicago, Illinois 60605

Re: Response to 2024 State Actuary Preliminary Report

Dear Members of the Board:

In accordance with your request, we have reviewed the State Actuary's Preliminary Report (dated November 26, 2024) on the Public School Teachers' Pension and Retirement Fund of Chicago ("CTPF"), pursuant to Illinois Public Act 100-0465. This preliminary report consists of a review of the June 30, 2024 actuarial valuation report prepared by Gabriel, Roeder, Smith & Company ("GRS").

Purpose of Preliminary Report

Illinois Public Act 100-0465 ("Act") amended the Illinois Pension Code (40 ILCS 5/17-127) and requires the State Actuary (Cheiron), to review the actuarial assumptions and actuarial valuation of the CTPF and to issue to the CTPF Board a preliminary report on the proposed certification prepared by GRS of the required State contribution for Fiscal Year 2026. Under the Act, the required State contribution consists of 0.544% of Teacher total capped payroll, plus the employer normal cost, plus an amount pursuant to paragraph (3) of Section 17-142.1 to defray health insurance costs. The purpose of the review is to identify any recommended changes to the actuarial assumptions and methods for the CTPF Board to consider before finalizing its certification of the required State contribution for FY 2026.

Conclusions of Preliminary Report

We are very pleased that the Preliminary Report, issued by the State Actuary, Cheiron, states as follows:

"In summary, we believe that the assumptions and methods used in the draft June 30, 2024 Actuarial Valuation, which are used to determine the required Fiscal Year 2026 State contribution, are reasonable. We also find that the certified portion of the contribution which the State is responsible for was properly calculated."

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Recommended Changes for Future Valuations

Cheiron, in the Preliminary Report, had the following two recommendations for future valuations:

1. We recommend the CTPF Board continue to annually review the economic assumptions (interest rate and inflation), as they did for this valuation, prior to commencing the valuation work and adjust assumptions accordingly.

GRS RESPONSE: GRS prepared a 2024 Actuarial Assumptions Study that reviewed all of the economic and demographic actuarial assumptions.

GRS believes this recommendation is reasonable and, with the Board's concurrence, we will continue to work with the Board to annually review the interest rate and inflation assumptions prior to commencing the valuation work.

2. In future economic assumption studies, we recommend GRS disclose more information about the survey data used in their analysis, including a list of investment consulting firms who participated in the survey and the effective date of the capital market assumptions received.

GRS RESPONSE: In future economic assumption studies, GRS will disclose more background information related to the GRS Capital Market Assumption Modeler used in the analysis, including a list of the investment consulting firms who participated in the survey.

GRS believes this recommendation is reasonable and will take it into consideration in the future.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

SIGNED ORIGINAL ON FILE

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