
Chapter One

AUDITOR GENERAL'S SUMMARY

REPORT CONCLUSIONS

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 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 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.

Review of Actuarial Assumptions

Cheiron reviewed the actuarial assumptions used in each of the six systems' actuarial valuations for the year ended June 30, 2019, and **concluded that they generally were reasonable. Cheiron did not recommend any changes to the assumptions used in the June 30, 2019 actuarial valuations.**

The combined total of the required Fiscal Year 2021 State contribution for the six retirement systems was \$9,921,008,721. 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.

Additional Disclosures and Changes for Future Valuations

Cheiron made recommendations for additional disclosures for the 2019 valuations and recommended changes for future valuations. Recommendations included the following:

- The Boards of SERS, JRS, and GARS should periodically retain the services of an independent actuary to conduct a full scope actuarial audit. Such an audit should fully replicate the original actuarial valuation, based on the same census data, assumptions, and actuarial methods used by the System's actuary.

- Cheiron continues to recommend 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 except for SURS complied with this recommendation prior to conducting the 2019 actuarial valuations.
- Cheiron assessed compliance for five of the systems (TRS, SURS, SERS, JRS, and GARS) with ASOP 51, a new actuarial standard which provides guidance to actuaries on the assessment and disclosure of risks. Cheiron found that each system made a good faith effort to comply with the new requirement but the risk sections in the valuation reports could be improved to better comply with the new requirements.

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. This law requires the actuaries 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 level 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 continues to recommend that the funding method be changed to fully fund plan benefits and discontinue the systematic underfunding of the systems.

According to the systems' 2019 actuarial valuation reports, the funded ratio of the retirement systems ranged from 47.4% (CTPF) to 16.0% (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. Cheiron continues to recommend the systems include stress testing within the valuation reports to better understand these risks.

INTRODUCTION AND 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, 2019, and **concluded that they generally were reasonable. Cheiron did not recommend any changes to the assumptions used in the June 30, 2019 actuarial valuations.**

Cheiron did recommend additional disclosures for the 2019 valuations and also recommended changes for future valuations. The systems’ responses to Cheiron’s preliminary reports can be found in Appendix C of this report.

Exhibit 1-1 summarizes the recommendations made to the retirement systems. At the end of each of the reports located in Chapters Two through Seven is a chart summarizing the status of recommendations made by the State Actuary in last year’s 2018 report. This year’s report contains 31 recommendations compared to 26 recommendations made in last year’s report.

Exhibit 1-1 RECOMMENDATIONS TO THE RETIREMENT SYSTEMS						
Recommendations	TRS	SURS	SERS	JRS	GARS	CTPF
Recommended Changes to Actuarial Assumptions used in the 2019 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 Additional Disclosures for the 2019 Actuarial Valuations:						
• Expand/include stress testing of the System within the valuation report	X	X	X	X	X	
• Include a more detailed explanation of how the new entrant assumption was developed and how the assumed salaries for new entrants change from year to year	X					
• Add a recommendation that an additional risk assessment be performed and included in the valuation report		X				
• Expand the description of the mortality assumption in the valuation report			X			
Recommended Changes for Future Actuarial Valuations:						
• Annually review the economic assumptions (interest rate and inflation rate) and adjust assumptions accordingly	X	X	X	X	X	X
• Improve the risk section of the valuation report to better comply with the requirements of ASOP 51	X	X	X	X	X	
• Consider reducing the salary increase assumption in future valuations or provide additional analysis to support the increased assumption	X					
• Provide additional information about the population used in the projection such as the average age and service of the population each year	X					
• Provide additional explanation and justification for methods used to develop the mortality assumptions			X			
• Include stress testing of the System within the valuation report						X
Other Recommendations:						
• Periodically retain the services of an independent actuary to conduct a full scope actuarial audit in which the results of the valuation are fully replicated			X	X	X	
• Change the funding method to fully fund plan benefits and discontinue the systematic underfunding of the system	X	X	X	X	X	
Source: OAG summary of Cheiron's preliminary reports to the six retirement systems.						

The following sections discuss some of the key assumptions and recommendations. Further details on the assumptions and recommendations, including those not discussed in this summary chapter, are contained in the State Actuary's preliminary reports for each of the retirement systems, found in Chapters Two through Seven of this report.

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. Exhibit 1-2 shows the interest rate assumptions for each of the six retirement systems. As can be seen in the exhibit, the interest rate assumption was lowered by three of the systems for the 2019 actuarial valuations.

Exhibit 1-2 INTEREST RATE ASSUMPTIONS June 30, 2019 Valuation		
System	Interest Rate	Notes
Teachers' Retirement System	7.00%	Lowered from 7.50% for the June 30, 2016 actuarial valuation
State Universities Retirement System	6.75%	Lowered from 7.25% for the June 30, 2018 actuarial valuation
State Employees' Retirement System	6.75%	Lowered from 7.00% for the June 30, 2019 actuarial valuation
Judges' Retirement System	6.50%	Lowered from 6.75% for the June 30, 2019 actuarial valuation
General Assembly Retirement System	6.50%	Lowered from 6.75% for the June 30, 2019 actuarial valuation
Chicago Teachers' Pension Fund	7.00%	Lowered from 7.25% for the June 30, 2018 actuarial valuation

Source: Retirement system actuarial reports.

Cheiron concluded that the interest rate assumptions for the six systems were reasonable. The actuary for TRS recommended lowering the interest rate assumption from 7.00% to 6.75%. However, the Board did not lower the assumption. Cheiron concurred with TRS' actuary's recommendation to lower the interest rate assumption but also concluded that the use of 7.00% was reasonable.

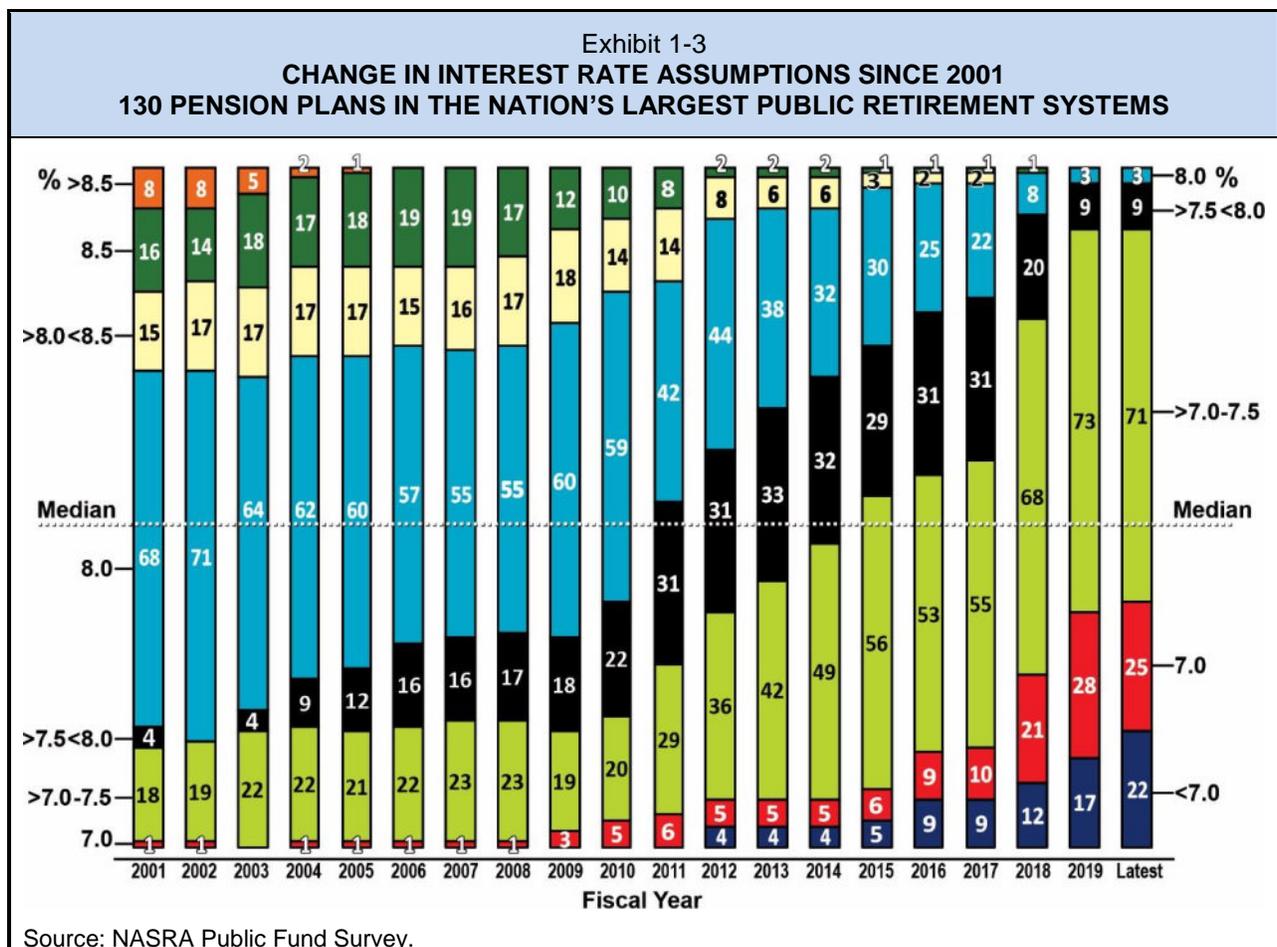
As it did in last year's report, Cheiron again recommended that the Boards annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work and adjust assumptions accordingly. All of the systems except SURS complied with this recommendation prior to conducting the 2019 actuarial valuations.

Cheiron noted that the systems are experiencing negative cash flows, which may impact the interest rate returns that are realized. Negative cash flow is measured as contributions less

benefits and expenses. Negative cash flows result in actuarial returns (i.e., “dollar weighted” returns) being less than “time weighted” returns.

Cheiron also noted that 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 2001 the yield on 10-year Treasury bonds (a proxy for a risk free investment) was 5.3%. To achieve an assumed return of 8.0%, a system’s investments had to outperform the yield on the 10-year Treasury by 2.7%. As of June 30, 2019, the yield on the 10-year Treasury is now 2.1%, and to achieve an assumed return of 6.5%, a system’s investments need to exceed the 10-year Treasury yield by 4.4%. So, even though, in this example, a system reduced its assumption by 150 basis points, it still has to take more investment risk in 2019 to meet its assumption than it did in 2001.

Cheiron discussed the nationwide movement among pension plans to lower the interest rate assumption. The National Association of State Retirement Administrators (NASRA) conducts the Public Fund Survey, which is an online compendium of key characteristics covering 130 public pension plans. Exhibit 1-3 shows the change in the interest rate assumptions, since the inception of the Public Fund Survey in 2001, for 130 public pension plans.



The exhibit shows the shift to lower interest rate assumptions. In 2001, 107 of the 130 plans (82%) used an interest rate assumption of 8.0% or higher. The most recent data, which includes results collected through November 2019, shows that this number has dropped to only 3 of 130 plans (2%) that use an interest rate of 8.0% or higher. The median assumption has fallen to 7.25%. Since Fiscal Year 2012, 114 of the 130 plans have reduced the interest rate assumption with an average reduction of 0.57%. In addition, 47 plans have adopted a rate of 7.0% or lower.

Inflation Assumption

The six retirement systems use inflation assumptions ranging from 2.25% to 2.50%. Exhibit 1-4 shows the inflation assumptions for each of the systems. Three of the systems lowered the inflation assumption for the 2019 valuations.

Exhibit 1-4 INFLATION ASSUMPTIONS June 30, 2019 Valuation		
System	Inflation Rate	Notes
Teachers' Retirement System	2.50%	Lowered from 3.00% for the June 30, 2016 actuarial valuation
State Universities Retirement System	2.25%	Lowered from 2.75% for the June 30, 2018 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	2.50%	Lowered from 2.75% for the June 30, 2017 actuarial valuation

Source: Retirement system actuarial reports and experience studies.

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 April 2019 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years), inflation will average somewhere between 2.0% and 3.2%. Under the intermediate cost projection, the Social Security Administration uses an assumption of 2.6%.
- Cheiron presented three inflation comparisons: 1) the distribution of inflation expectations for the Third Quarter 2019 survey of professional economic forecasters published by the Philadelphia Federal Reserve; 2) the 2019 Horizon survey of investment consultant capital market assumptions; and 3) the 2018 inflation assumptions used by plans in the Public Plans Database. The 2.50% rate used by TRS and CTPF is higher than the middle of the range projected by professional

economic forecasters and investment consultants but is below the median rate used by other public plans. The 2.25% rate used by the remaining four systems is near the middle of the range projected by professional economic forecasters and investment consultants, and is on the low end of the range used by other public 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. The systems that lowered their inflation assumptions also lowered their salary increase assumptions.

In 2018, TRS increased its salary increase assumption based on experience over the prior three years. Cheiron was concerned that the analysis performed for the salary increase assumptions resulted in an assumption for salary increases that is at the very high end of a reasonable range. Cheiron recommended the TRS Board consider reducing the salary increase assumption in future valuations or provide additional analysis to support the increased 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. As it did last year, Cheiron included additional analysis in its reports on each of the systems. Cheiron collected data from past valuation reports dating back to 2013 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 Two through Seven. 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.** Exhibit 1-5 shows the amounts of proposed State contributions submitted by the systems for Fiscal Year 2021 and compares it to the previous year’s contribution.

Exhibit 1-5 AMOUNTS OF STATUTORILY REQUIRED STATE CONTRIBUTIONS		
System	State Contribution (for Fiscal Year 2020)	State Contribution (for Fiscal Year 2021)
Teachers’ Retirement System	\$4,813,577,696	\$5,140,736,721
State Universities Retirement System	\$1,864,976,000	\$2,001,296,000
State Employees’ Retirement System	\$2,293,074,000	\$2,348,499,000
Judges’ Retirement System	\$144,160,000	\$148,618,000
General Assembly Retirement System	\$25,754,000	\$27,299,000
Chicago Teachers’ Pension Fund ¹	\$245,487,000	\$254,560,000
Total	\$9,387,028,696	\$9,921,008,721
¹ The State contribution for CTPF is limited to the employer normal cost for that fiscal year. Source: 2019 Retirement system actuarial valuation reports.		

Cheiron noted that, in accordance with 30 ILCS 5/2-8.1, its review does not include a replication of the actuarial valuation results. Beginning with the December 2014 State Actuary Report, Cheiron recommended that the Boards periodically undertake a full scope actuarial audit, utilizing the services of a reviewing actuary. Such an audit should fully replicate the original actuarial valuation, based on the same census data, assumptions, and actuarial methods used by the Systems’ actuaries. This does not apply to CTPF as Cheiron’s review of CTPF is more limited in scope.

Two of the systems (TRS and SURS) complied with this recommendation but SERS, JRS, and GARS have not. Given the size of the systems, the Plans’ low funded ratios, the recent changes in legal requirements, and guidance issued by the Government Finance Officers Association, Cheiron continues to recommend that the Boards at SERS, JRS, and GARS periodically undertake a full scope actuarial audit, utilizing the services of a reviewing actuary. The response to last year’s reports stated that the Boards at SERS, JRS, and GARS would discuss the need for a full scope actuarial audit with management prior to the next valuation. We were provided no evidence that any discussions took place.

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 accrued 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 their later years of service than over their earlier ones.

As a result of this pattern of benefit values increasing, while the Projected Unit Credit method is not an unreasonable method, more plans use the Entry Age Normal funding method to mitigate this effect. It should also be noted that the Entry Age Normal 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 26 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.

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. This law requires the actuaries 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 level 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%. In addition, the State mandated method produces a contribution that results in a significant increase in the unfunded actuarial liabilities over the next decade if all assumptions are met.

Cheiron continues to recommend that the funding method be changed to fully fund plan benefits and discontinue the systematic underfunding of the systems. The funding method should target 100% of the actuarial accrued liability, and contributions should ramp up as quickly as possible to a level that is expected to prevent the unfunded actuarial accrued liability from growing. Continuing the practice of underfunding the systems increases the risk of needing even larger contributions in the future that may make the systems unsustainable.

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’ 2019 actuarial valuation reports, the funded ratio of the systems ranged from 47.4% (CTPF) to 16.0% (GARS) based on the actuarial value of assets as a ratio to the actuarial liability (see Exhibit 1-6). If there is a significant market downturn, the unfunded actuarial liability and the required State contribution rate could both increase, putting the sustainability of the systems further into question.

Exhibit 1-6 SYSTEM FUNDED RATIO (ACTUARIAL VALUE OF ASSETS)	
System	Funded Ratio
Teachers’ Retirement System	40.6%
State Universities Retirement System	42.3%
State Employees’ Retirement System	37.8%
Judges’ Retirement System	38.3%
General Assembly Retirement System	16.0%
Chicago Teachers’ Pension Fund	47.4%
Source: 2019 actuarial valuation reports.	

Cheiron recommended stress testing be done to better understand risks to the sustainability of the systems. The stress testing should be included within the valuation report and include a thorough explanation of the implications that volatile investment returns and a variety of other stressors (e.g., membership declines, lower salary growth) can have on future State costs. In particular, the tests should illustrate the potential stresses on the System and its contributing sponsors so that an assessment of sustainability can be made. Cheiron recommends such stress testing be included in the valuation report because that is the report that most stakeholders of the plan look to for assessing the plan's financial condition. Supplemental reports may not be publicly identified and therefore not readily accessible.

Assessment and Disclosure of Risk

A new Actuarial Standard of Practice (ASOP) has been introduced, ASOP 51, and is effective for the systems' actuarial valuation starting June 30, 2019. 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.) Cheiron found that each system made a good faith effort to comply with the new requirement, but the risk section in the valuation reports could be improved to better comply with the new requirements. For future risk disclosure, Cheiron recommended:

- An assessment should be provided for each risk that is identified.
- An explanation should be provided as to how the maturity measures calculated and disclosed help the reader to understand the risks identified.
- Historical values that are significant to understanding the risks identified should be disclosed along with an explanation of how they help the reader understand the risks identified.

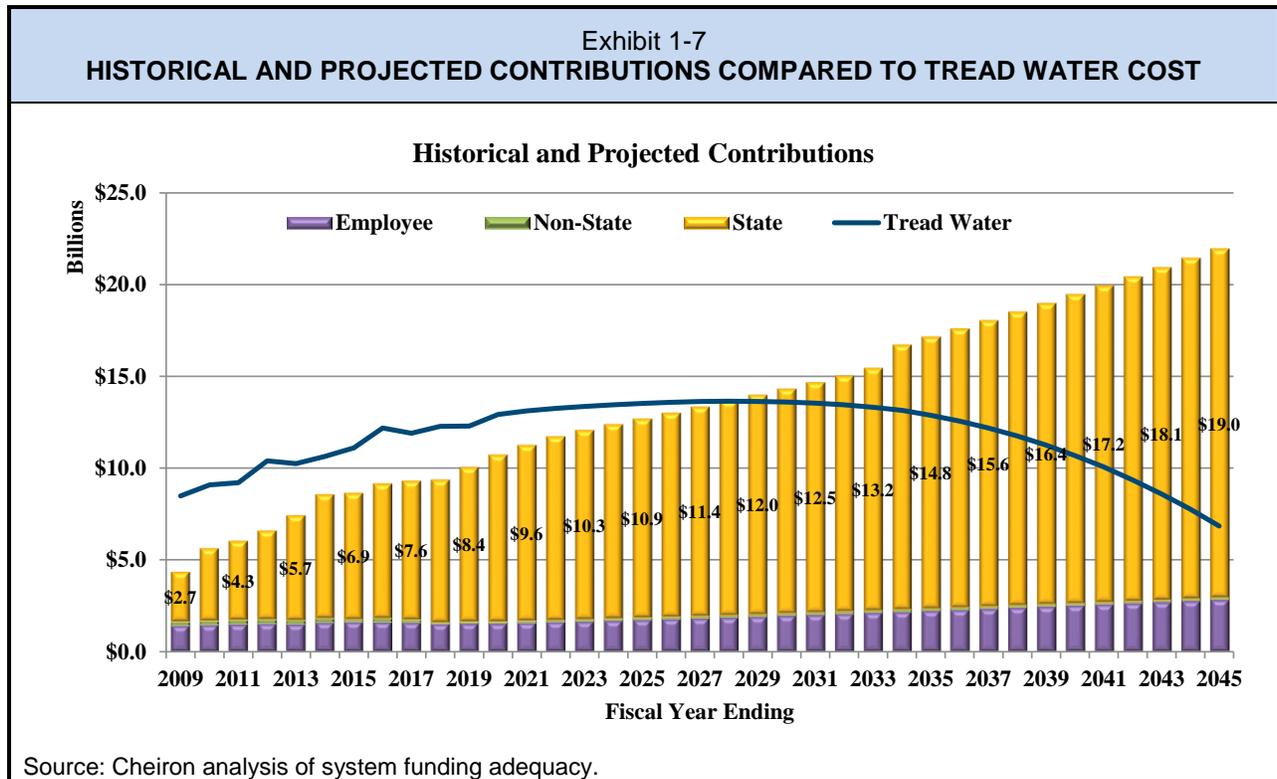
ANALYSIS OF FUNDING ADEQUACY

Cheiron examined the adequacy of the funding for the systems, including funded status, 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 Two through Seven of this report.

One of the persistent 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).

Exhibit 1-7 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, and this trend is projected to continue for several years into the future. 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 significantly before the total contribution reaches the tread water contribution and begins to pay down the unfunded actuarial liability.



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 C.

