
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) 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, 2017, and **concluded that they generally were reasonable with two exceptions, both of which applied to the Chicago Teachers' Pension Fund.** Cheiron recommended:

- For the Chicago Teachers' Pension Fund, the interest rate assumption should be lowered to a rate no higher than 7.25% for the June 30, 2017 valuation.
- For the Chicago Teachers' Pension Fund, the wage inflation assumption should be lowered from 3.50% to 3.25% for the June 30, 2017 valuation.

After receiving the draft report from the State Actuary, the CTPF Board accepted the recommendations and adopted an interest rate assumption of 7.25% and a wage inflation assumption of 3.25% at its December 14, 2017 Board meeting.

The combined total of the required State contribution for the six retirement systems was \$8,678,855,109. Cheiron verified the arithmetic calculations made by the systems' actuaries to develop the required State contribution and reviewed the assumptions on which the calculations were based.

Public Act 100-0023 Statutory Funding Changes

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 5-year period. This Act applied to five of the systems but did not apply to CTPF. The actuaries for the retirement systems interpreted the new requirement in two different ways leading Cheiron to recommend that four of the systems review the way they have phased-in the prior assumption changes or demonstrate with additional disclosures that the method produces the appropriate result as defined in the Act.

Public Act 100-0023 also required each of the five systems to recertify the amount of the State contributions for fiscal year 2018 taking into account the phasing-in of assumption changes that may have occurred beginning in fiscal year 2014. After taking into account the phasing-in of assumption changes, the total fiscal year 2018 required State contribution decreased by over \$900 million.

Additional Disclosures and Changes for Future Valuations

Cheiron also made recommendations for additional disclosures for the 2017 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.

State Mandated Funding Method

For five of the retirement systems (TRS, SURS, SERS, JRS, and GARS), the Illinois Pension Code requires the systems' actuaries to calculate the required State contribution using a prescribed funding method that achieves 90 percent funding in the year 2045. Cheiron concluded that **this funding method does not meet** generally accepted actuarial principles because the systems are never targeted to be funded to 100 percent and the funding of the systems is significantly deferred into the future. Cheiron recommended that the funding method be changed to at least fully fund future plan benefit accruals to avoid continued systematic underfunding of the systems.

According to the systems' 2017 actuarial valuation reports, the funded ratio of the retirement systems ranged from 51.3% (CTPF) to 14.9% (GARS), based on the actuarial value of assets as a ratio to the actuarial liability. Cheiron has concerns about the solvency of the systems if there is a significant market downturn and recommended the systems include stress testing within the valuation reports.

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 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.

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) 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 nine 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, 2017, and **concluded that they generally were reasonable with two exceptions:**

- For the Chicago Teachers’ Pension Fund, the interest rate assumption should be lowered to a rate no higher than 7.25%.
- For the Chicago Teachers’ Pension Fund, the wage inflation assumption should be lowered from 3.50% to 3.25%.

After receiving the draft report from the State Actuary, the CTPF Board accepted the recommendations and adopted an interest rate assumption of 7.25% and a wage inflation assumption of 3.25% at its December 14, 2017 Board meeting.

Cheiron did not recommend any additional changes to the assumptions used in the June 30, 2017 actuarial valuations. Cheiron did recommend additional disclosures for the 2017 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 Six is a chart summarizing the status of recommendations made by the State Actuary in the 2016 report. This chart is not included in the report to CTPF in Chapter Seven as this is the first year the system was reviewed. This year’s report contains 33 recommendations compared to 25 recommendations made in last year’s report. The increased number of recommendations is the result of the funding changes required in Public Act 100-0023 and the addition of CTPF to the systems being reviewed.

Exhibit 1-1 RECOMMENDATIONS TO THE RETIREMENT SYSTEMS						
Recommendations	TRS	SURS	SERS	JRS	GARS	CTPF
Recommended Changes to Actuarial Assumptions used in the 2017 Actuarial Valuations:						
• Lower the interest rate assumption to a rate no higher than 7.25%						X
• Since the general inflation assumption was lowered to 2.50%, lower the wage inflation assumption from 3.50% to 3.25%						X
Other than these two exceptions, Cheiron reviewed the actuarial assumptions and concluded that they were reasonable.						
Recommended Additional Disclosures for the 2017 Actuarial Valuations:						
• Expand/include stress testing of the System within the valuation report	X	X	X	X	X	
• Disclose why it relied on different capital market forecasts than used in similar reviews of other Illinois systems						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
• Evaluate the implications of the one year delay in data used for the valuation to substantiate if it is immaterial	X					
Conformance to Statutory Funding Changes of Public Act 100-0023:						
• Review the method used to phase-in prior assumption changes or demonstrate with additional disclosures that the method produces the appropriate result		X	X	X	X	
• Include an exhibit in the recertification document demonstrating how the new amounts were determined	X		X	X	X	
• Reflect the hybrid plan in the June 30, 2017 valuation	X					
• Include additional disclosures demonstrating that Tier 3 benefits will have an immaterial impact on funding			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 four of the systems for the 2016 actuarial valuations.

Exhibit 1-2 INTEREST RATE ASSUMPTIONS June 30, 2017 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	7.25%	Lowered from 7.75% for the June 30, 2014 actuarial valuation
State Employees' Retirement System	7.00%	Lowered from 7.25% for the June 30, 2016 actuarial valuation
Judges' Retirement System	6.75%	Lowered from 7.00% for the June 30, 2016 actuarial valuation
General Assembly Retirement System	6.75%	Lowered from 7.00% for the June 30, 2016 actuarial valuation
Chicago Teachers' Pension Fund	7.50% ¹	Lowered from 7.75% for the June 30, 2017 actuarial valuation
¹ After receiving the draft report from the State Actuary, the CTPF Board lowered its interest rate assumption to 7.25%		
Source: Retirement system actuarial reports.		

Also as shown in Exhibit 1-2, the Chicago Teachers' Pension Fund lowered its interest rate assumption from 7.75% to 7.25% for the 2017 actuarial valuation. The actuary for CTPF performed a review of the economic assumptions and presented the results to the Board at the Board's September 21, 2017 meeting. The CTPF actuary recommended the Board lower the interest rate assumption from 7.75% to 7.25%. However, initially the Board did not adopt that recommendation and instead adopted an interest rate assumption of 7.50%. CTPF officials indicated that, as reflected in the Board's records of the October meeting, the CTPF Board supported a reduction in the interest rate assumption but noted its belief that a one-step 0.5% reduction in the year before the Fund's scheduled 2018 experience study and economic review was premature. Officials noted, after consideration of various economic, investment return, and actuarial factors, the Board accepted its actuary's recommendation, in part, reducing the interest rate assumption from 7.75% to 7.50% but pledged to make an additional reduction in 2019.

Cheiron concluded that the use of 7.50% was overly aggressive and recommended lowering the interest rate assumption to a rate no higher than 7.25% for the 2017 valuation. On December 14, 2017, after receiving the draft report from the State Actuary, the Board of trustees for the Chicago Teachers' Pension Fund adopted the recommended change and lowered the interest rate assumption to 7.25%.

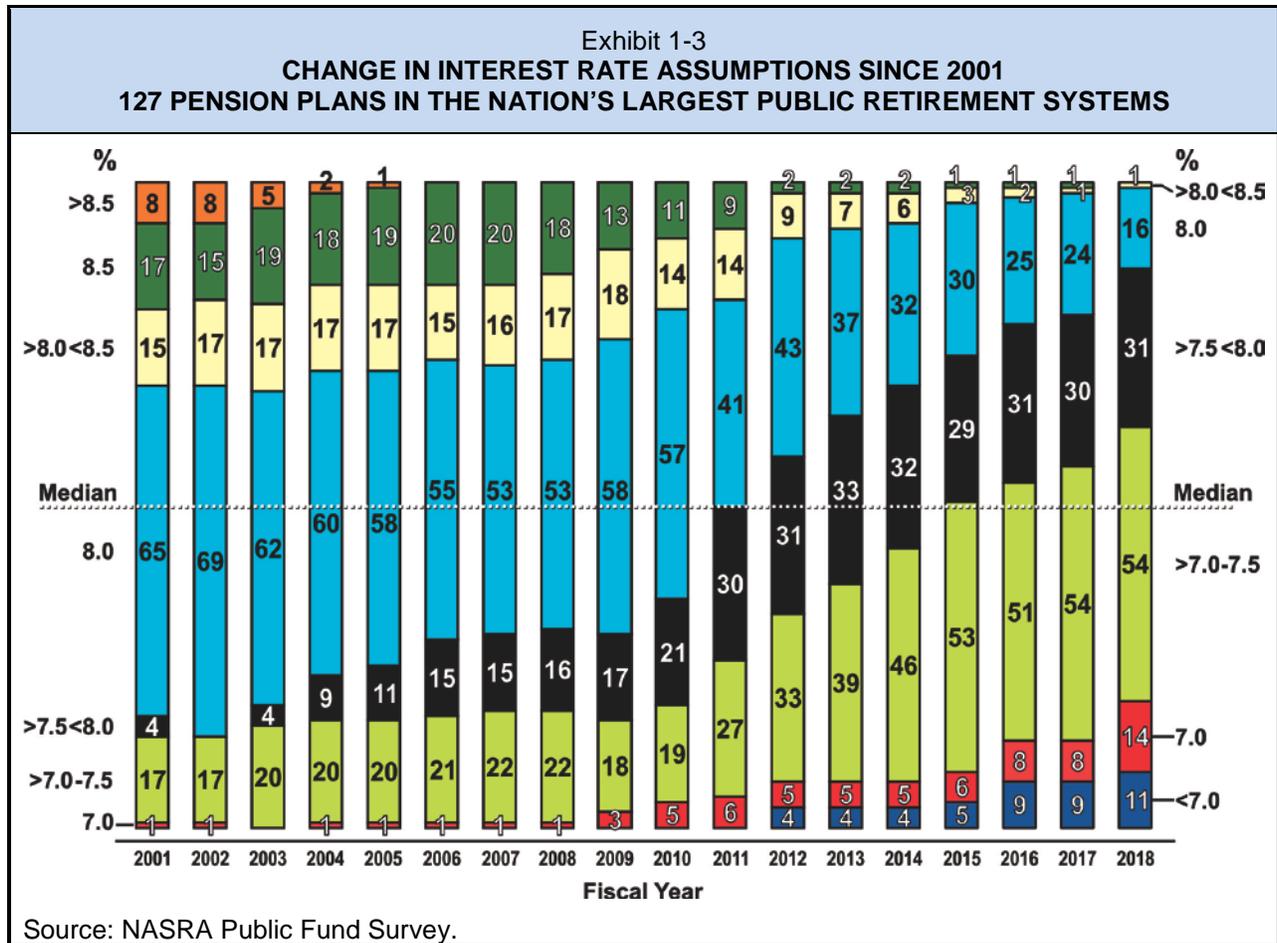
Cheiron concluded that the interest rate assumptions for the other five systems were reasonable. As it did in last year's report, Cheiron again recommended that the Boards annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work and adjust assumptions accordingly. All of the systems complied with this recommendation prior to conducting the 2017 actuarial valuations.

Cheiron noted that the systems are, or will be, 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. TRS, SURS, and CTPF are experiencing negative cash flows while SERS, JRS, and GARS are projected to begin having negative cash flows in the near future. Negative cash flows result in actuarial returns (i.e., "dollar weighted" returns) being less than "time weighted" returns.

Cheiron also noted that there has been emerging actuarial practice throughout the country to reduce the discount rates even below the level that the investment consultants believe is achievable. This is because of the very low interest rate environment we are currently experiencing. The lower the interest rate environment, the greater the investment risk that must be taken to achieve an assumed rate of return.

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 127 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 127 public pension plans.

The exhibit shows the shift to lower interest rate assumptions. In 2001, 105 of the 127 plans (83%) used an interest rate assumption of 8.0% or higher. The most recent data, which includes results collected through November 2017, shows that this number has dropped to only 17 of 127 plans (13%) that use an interest rate of 8.0% or higher. The median assumption has fallen to 7.5%. Since Fiscal Year 2011, 105 of the 127 plans have reduced the interest rate assumption with an average reduction of 0.49%. In addition, 25 plans have adopted a rate of 7.0% or lower.



Inflation Assumption

The six retirement systems use inflation assumptions ranging from 2.50% to 2.75%. Exhibit 1-4 shows the inflation assumptions for each of the systems. As with the interest rate assumption, four of the systems lowered the inflation assumption for the 2016 valuations and one system, CTPF, lowered the inflation assumption for the current valuation.

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

- The July 2017 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%.
- The National Conference on Public Employee Retirement Systems (NCPERS) compared public sector retirement systems’ inflation assumptions in a study published in December 2016. The study shows that the 2.50% assumption used by TRS and CTPF, and the 2.75% assumption used by the remaining four systems, is lower than the average rate of 3.0% for the 159 systems who responded to the study.

Exhibit 1-4 INFLATION ASSUMPTIONS June 30, 2017 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	2.75%	Lowered from 3.75% for the June 30, 2011 actuarial valuation
State Employees' Retirement System	2.75%	Lowered from 3.00% for the June 30, 2016 actuarial valuation
Judges' Retirement System	2.75%	Lowered from 3.00% for the June 30, 2016 actuarial valuation
General Assembly Retirement System	2.75%	Lowered from 3.00% for the June 30, 2016 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.		

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. As shown in Exhibit 1-4, CTPF lowered its inflation assumption from 2.75% to 2.50% for its 2017 actuarial valuation. However, CTPF did not lower its 3.50% salary increase assumption to correspond with the lowering of its inflation assumption. This implies that the productivity component had been increased from 0.75% to 1.00%. Cheiron found that to be unreasonable. **Cheiron recommended that CTPF lower its salary increase assumption from 3.50% to 3.25% for the 2017 actuarial valuation.** On December 14, 2017, after receiving the draft report from the State Actuary, the Board of trustees for the Chicago Teachers' Pension Fund adopted the recommended change and lowered the salary increase assumption to 3.25%.

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 2011 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 the calculations were based.** Exhibit 1-5 shows the amounts of proposed State contributions submitted by the systems for Fiscal Year 2019.

Exhibit 1-5 AMOUNTS OF STATUTORILY REQUIRED STATE CONTRIBUTIONS	
System	State Contribution (for Fiscal Year 2019)
Teachers’ Retirement System	\$4,466,178,109
State Universities Retirement System	1,655,154,000
State Employees’ Retirement System	2,165,841,000
Judges’ Retirement System	140,469,000
General Assembly Retirement System	23,221,000
Chicago Teachers’ Pension Fund ¹	227,992,000
Total	\$8,678,855,109
¹ The State contribution for CTPF is limited to the employer normal cost for that fiscal year. Source: 2017 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. Two of the systems (TRS and SURS) complied with this recommendation but SERS, JRS, and GARS have not. Given the size of SERS, 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.

CONFORMANCE TO STATUTORY FUNDING CHANGES

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 5-year period. This Act applied to five of the systems but did not apply to CTPF. The Act requires that the impact of assumption changes “*be implemented in equal annual amounts over a 5-year period beginning in the State fiscal year in which the actuarial change first applies to the required State contribution.*” This amount is then implemented “*at the resulting annual rate in each of the remaining fiscal years in that 5-year period.*”

The actuaries for the retirement systems interpreted this in two different ways:

- The actuary for TRS interpreted this to mean determining the change in the required State contribution, and phasing in the change over five years in **equal dollar amounts**.
- The actuaries for SURS, SERS, JRS, and GARS interpreted this to mean determining the cost impact of the change, converting it to a **percentage of payroll**, and reflecting one-fifth of that percentage change over five years.

Cheiron believes the second method may not match the adjustment as described in the Act. Because payroll changes each year, using a percentage of payroll will result in different dollar amounts each of the five years and thus not the “*equal annual amounts*” required by the Act. **Cheiron recommended the actuaries review the way they have phased-in the prior assumption changes or demonstrate with additional disclosures that the method produces the appropriate result as defined in the Act.**

Fiscal Year 2018 State Contribution Recertification

Public Act 100-0023 also required each of the five systems recertify the amount of the State contributions for fiscal year 2018 taking into account the phasing-in of assumption changes that may have occurred beginning in fiscal year 2014. Exhibit 1-6 shows both the original State contribution amounts submitted last year and the recertified amounts submitted this year. After taking into account the phasing-in of assumption changes, the total fiscal year 2018 required State contribution decreased by over \$900 million.

Exhibit 1-6 RECERTIFICATION OF FISCAL YEAR 2018 STATE CONTRIBUTIONS		
System	Original Amount	Recertified Amount
Teachers’ Retirement System	\$4,564,952,674	\$4,095,316,146
State Universities Retirement System	1,753,685,000	1,629,307,606
State Employees’ Retirement System	2,327,649,000	2,029,583,000
Judges’ Retirement System	146,766,000	135,622,000
General Assembly Retirement System	26,679,000	21,155,000
Total	\$8,819,731,674	\$7,910,983,752

Source: Retirement system funding recertification documents.

For four of the systems, Cheiron recommended that the actuaries include additional information in the recertification documents to support the revised amounts. This should include an exhibit demonstrating how the new amounts were determined. Otherwise, the recertification may not be considered a complete actuarial communication as the information in the document as a stand-alone communication was insufficient.

ACTUARIAL METHODS

Actuarial methods consist of three components: (1) the funding method, which is the attribution of total costs to past, current, and future years; (2) the method of calculating the actuarial value of assets (i.e., asset smoothing); and (3) the amortization basis of the Unfunded Actuarial Liability (UAL). The amortization basis is discussed under the State Mandated Funding Method in the next section on page 14.

Funding Method

All of the retirement systems use the Projected Unit Credit (PUC) 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 PUC 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 (EAN) funding method as it is more consistent with the Pension Code’s requirement for level percent of pay funding.

Under the PUC 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 cost of providing benefits based on past service and future compensation is the actuarial accrued 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 their later years of service than over their earlier ones.

As a result of this pattern of benefit values increasing, while the PUC method is not an unreasonable method, more plans use the EAN funding method to mitigate this effect. It should also be noted that the EAN method is the required method to calculate liability for the Governmental Accounting Standards Board Statements 67 and 68.

Asset Smoothing 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 that the fluctuations in the actuarial value of assets will be less volatile over time than fluctuations in 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.

Another aspect of asset smoothing methods is whether or not to limit the maximum spread between the actuarial value of assets and the market value of assets. Many public sector pension plans limit the actuarial value of assets to be in any year no more than 120% of market value, or no less than 80% of market value. In fact, the Internal Revenue Service (26 USC 430(g)(3)(B)(iii)) mandates a similar “corridor” for private sector pension plans (a 90%-110% corridor is mandated). Even though it is not mandated for public plans, Cheiron believes that the use of this type of corridor is a sounder actuarial practice, and according to ASOP No. 44 in Section 3.3 b. 1, the actuarial value of assets should “...*fall within a reasonable range around the corresponding market values.*”

STATE MANDATED FUNDING METHOD

For five of the retirement systems (TRS, SURS, SERS, JRS, and GARS), the Illinois Pension Code requires that the systems’ actuaries base the required contribution using a prescribed funding method that achieves 90 percent funding in the year 2045. In the actuarial valuation reports, the systems’ actuaries discuss their concerns with this funding method.

- In TRS’ June 30, 2017 Actuarial Valuation Report, TRS’ actuary recommends an actuarial funding method that targets 100% funding where payments at least cover interest on the unfunded actuarial accrued liability and a portion of the principal balance. With support of the TRS Board, TRS’ actuary reports on an alternative funding method that they consider representative of generally accepted actuarial methods and refers to this method as Actuarial Math 2.0. This method uses the Entry Age Normal method and amortizes the unfunded liability over 20 years.
- In SURS’ June 30, 2017 Actuarial Valuation Report, SURS’ actuary comments that the Statutory funding method generates a contribution that is less than a reasonable actuarially determined contribution. The actuary recommends a funding policy which would use the Entry Age Normal method and contribute the normal cost plus an amortization of the unfunded accrued liability over a closed period of no less than 15 years and no more than 27 years to attain 100 percent funding by 2045.
- In the June 30, 2017 actuarial valuations for SERS, GARS, and JRS, the actuary advises “strengthening the current statutory funding policy” and included examples such as the following:
 - Increasing the 90 percent funding target to 100 percent;
 - Reducing the projection period needed to reach the funding target; and
 - Changing the actuarial cost method for calculating liabilities from the Projected Unit Credit cost method to the Entry Age Normal cost method.

Cheiron concurred with recommendations of the systems’ actuaries. Cheiron concluded that the Pension Code funding method does not meet generally accepted actuarial principles because the systems are not targeted to be funded to 100 percent and the funding of the System is pushed too far into the future. Cheiron recommended that the funding method be changed to

fully fund plan benefits and discontinue the systematic underfunding of the systems. Continuing the practice of underfunding future accruals increases the risk of the systems becoming unsustainable.

Based on the systems’ 2017 actuarial valuation reports, the funded ratio of the systems ranged from 51.3% (CTPF) to 14.9% (GARS) based on the actuarial value of assets as a ratio to the actuarial liability (see Exhibit 1-7). Cheiron has concerns about the solvency of the systems if there is a significant market downturn.

Exhibit 1-7 SYSTEM FUNDED RATIO (ACTUARIAL VALUE OF ASSETS)	
System	Funded Ratio
TRS	40.2%
SURS	44.4%
SERS	35.5%
JRS	35.6%
GARS	14.9%
CTPF	51.3%
Source: 2017 actuarial valuation reports.	

For five of the retirement systems (TRS, SURS, SERS, JRS, and GARS), Cheiron recommended stress testing be done or be expanded to demonstrate the likelihood there will be sufficient assets to pay benefits if there is a significant market downturn. The stress testing should be included within the valuation report and include a thorough explanation of the implications that volatile investment returns and other stressors (e.g., membership declines, lower salary growth) can have on future State costs. In particular, the tests should demonstrate whether or not there is a potential for unsustainable costs during the statutory funding period. The reason Cheiron recommends such stress testing be included in the valuation report is because the public may only look to the valuation report for this type of information. The stress testing should be contained in the valuation report instead of any supplemental document to the Board that may potentially be overlooked.

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.

