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**STATE OF ILLINOIS**

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**OFFICE OF THE AUDITOR GENERAL**

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**STATE ACTUARY'S REPORT**

**THE ACTUARIAL ASSUMPTIONS AND  
VALUATIONS OF THE FIVE STATE-FUNDED  
RETIREMENT SYSTEMS**

**DECEMBER 2013**

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**WILLIAM G. HOLLAND**

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**AUDITOR GENERAL**

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OFFICE OF THE AUDITOR GENERAL  
WILLIAM G. HOLLAND

*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 2013 report on the actuarial assumptions and valuations of the five 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. 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.

A handwritten signature in blue ink, appearing to read "William G. Holland".

WILLIAM G. HOLLAND  
Auditor General

Springfield, Illinois  
December 2013



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## GLOSSARY OF TERMS

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**Actuarial Assumptions** – Estimates of future experience with respect to rates of mortality, disability, turnover, retirement, interest rate (also called the investment return or discount rate) and inflation. Demographic assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (interest rate and inflation) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Gain (Loss)** – The difference between actual experience and actuarial assumed experience during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial funding method.

**Actuarial Liability** – The Actuarial Liability is the present value of system benefits that have been allocated by an Actuarial Cost Method to past service as of the valuation date. It is also the difference between the Present Value of Future Benefits and the Present Value of Future Normal Costs. It is referred to by some actuaries as the “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** – The Actuarial Value of Assets equals the Market Value of Assets adjusted according to a smoothing method. The smoothing method in Illinois Law is intended to smooth out the short-term volatility of investment returns in order to stabilize contribution rates and the funded status reported under GASB 25 and 27.

**Actuarial Cost Method** – A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Annual Required Contribution** – The sum of the normal cost and amortization of the unfunded actuarial accrued liability over a period not to exceed 30 years. Currently required for accounting principles by the Governmental Accounting Standards Board (GASB).

**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 allocated to a valuation year is called the Normal Cost. The portion of this Present Value of Future Benefits not provided for at a

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## GLOSSARY OF TERMS

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valuation date by the Present Value of Future Normal Costs is called the Actuarial Liability.

**Funded Status** – The Actuarial Value of Assets divided by the Actuarial Liability. The Funded Status represents the percentage of assets in the Plan compared to the Actuarial Liability. The Funded Status 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. 25 defines the plan accounting and financial reporting for governmental pension plans, and GASB Statement No. 27 defines the employer accounting and financial reporting for participating in a governmental pension plan.

**Market Value of Assets** – The fair value of the Plan’s assets assuming that all holdings are liquidated on the measurement date.

**Net Pension Obligation** – The cumulative difference between annual pension cost and the employer’s contributions to the plan.

**Normal Cost** – The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Present Value of Future Benefits** – The Actuarial Present Value of all benefits promised in the future to current members of the Plan 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 difference between the actuarial accrued liability and valuation of assets. Sometimes referred to as “unfunded accrued liability.”

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## Chapter One

# AUDITOR GENERAL'S SUMMARY

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## 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.

Cheiron reviewed the actuarial assumptions used in each of the five systems' actuarial valuations for the year ended June 30, 2013 and **concluded that they generally were reasonable**. Cheiron did not recommend any changes to the assumptions used in the June 30, 2013 actuarial valuations. **Cheiron did, however, raise concerns regarding the interest rate assumptions used by three of the systems (SERS, SURS, and TRS) and recommended for the upcoming June 30, 2014 valuations that the interest rates be lowered.** Should the Boards decide not to lower their interest rate assumptions, Cheiron requested that the Boards provide Cheiron with substantial justification as to why the rates should not be lowered.

Cheiron made recommendations for additional disclosures for the 2013 valuations and also recommended changes for future valuations. Recommendations included the following:

- The SERS, SURS, and TRS actuarial valuations should more fully analyze and disclose the source of losses which have been occurring, but not fully explained, in the valuations for several years. While last year's State Actuary report recommended that these losses be explained, corrective action was not taken.
- The Boards should annually review the interest rate and inflation assumptions as opposed to waiting for the completion of a formal experience study.
- The systems' actuaries, in future valuations, should consider establishing a corridor that would limit the maximum spread between the actuarial value of assets (smoothed value) and the market value of assets so that the actuarial value of assets, in any year, would be no more than 120 percent of market value or no less than 80 percent of market value. A move to this approach would have no impact on the 2013 actuarial

valuation results as the actuarial value of assets for all five systems is currently within the 80 percent to 120 percent corridor.

- The systems should use fully generational mortality tables.

Cheiron verified the arithmetic behind the calculations made by the systems' actuaries to develop the required State contribution and reviewed the assumptions on which the calculations were based. Cheiron recommended that the systems' actuaries disclose additional information in future valuation reports.

The Illinois Pension Code requires that the systems' actuaries 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 actuarial standards of practice because the systems are not targeted to be funded at 100 percent and the funding of the plans is pushed back to later years. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of the systems.** Furthermore, based on the systems' 2013 actuarial valuation reports, the funded ratio of the systems ranged from 41.5 percent (SURS) to 16.2 percent (GARS) based on the actuarial value of assets as a ratio over the actuarial liability. Cheiron has concerns about the solvency of the systems if there is a significant market downturn. **Cheiron suggests, due to the systematic underfunding of the systems, that the systems' Boards always use the conservative end of any range of assumptions recommended by their actuaries. Cheiron also recommended stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.**

**Information presented in this report is based on State statute in effect at June 30, 2013 and does not take into consideration any effect of Public Act 98-599, signed by the Governor on December 5, 2013.**

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## INTRODUCTION AND BACKGROUND

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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 five State-funded retirement systems. The five State-funded retirement systems are:

- 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.

### **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.

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## REVIEW OF THE ACTUARIAL ASSUMPTIONS

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Cheiron reviewed the actuarial assumptions used in each of the five systems' actuarial valuations for the year ended June 30, 2013 and **concluded that they generally were reasonable**. Cheiron did not recommend any changes to the assumptions used in the June 30, 2013 actuarial valuations. **Cheiron did, however, raise concerns regarding the interest rate assumptions used by three of the systems (SERS, SURS, and TRS) and recommended for the upcoming June 30, 2014 valuations that the interest rates be lowered**. Should the Boards decide not to lower their interest rate assumptions, Cheiron requested that the Boards provide Cheiron with substantial justification as to why the rates should not be lowered.

Cheiron also made recommendations for additional disclosures for the 2013 valuations and recommended changes for future valuations. In their responses to Cheiron's preliminary reports, systems indicated that they were planning to add to their 2013 valuations some of the additional disclosures recommended by Cheiron. The systems' responses to Cheiron's preliminary reports can be found in Appendix C of this report.

Exhibit 1-1 summarizes the recommendations made for the various retirement systems. At the end of each of the reports located in Chapters 2 through 6 is a chart summarizing the status of recommendations made by the State Actuary in the 2012 report.

Exhibit 1-1 <b>RECOMMENDATIONS TO THE RETIREMENT SYSTEMS</b>					
Recommendations	TRS	SURS	SERS	JRS	GARS
<b>Recommended Changes to Actuarial Assumptions used in the 2013 Actuarial Valuations:</b>					
Cheiron did not recommend actuarial assumption changes this year. However, Cheiron recommended that the interest rate assumptions used by SERS, SURS, and TRS be lowered for the upcoming June 30, 2014 valuation.					
<b>Recommended Additional Disclosures for the 2013 Actuarial Valuations:</b>					
• Include normal cost development in all projections	X				
• Disclose a detailed breakdown of the actuarial liabilities for each participant class	X				
• Include a reconciliation of the implication of the census data lag for the inactive data	X				
• Expand discussion of the change in the treatment of federal funds contribution rate	X				
• Provide additional analysis and more thorough disclosure to help determine the source of unexplained losses	X	X	X		
• More completely describe the active participant mortality table and the administrative expense rate	X				
• Include an explicit development that shows all sub-components and additional details related to the development of the required State contribution	X				
• Explain the rationale to lower the Effective Rate of Interest		X			
<b>Recommended Changes for Future Actuarial Valuations:</b>					
• Annually review the interest and inflation rate assumptions and adjust assumptions accordingly	X	X	X	X	X
• Consider establishing a corridor around the market value of assets of 80% to 120% beyond which the actuarial value is limited	X	X	X	X	X
• Disclose additional items useful to review the system’s funded status in 2045 (such as future benefit payouts split by active and inactives, and/or splitting active member information into specified groups)	X		X	X	X
• Include changes made as a result of the State Actuary review in its valuation report (rather than in a supplement)	X				
• Other minor recommendations	X	X	X	X	X
• Include historic development of assets without Government Obligation Bonds	X	X	X	X	X
• Consider using a fully generational mortality table		X	X	X	X
• Disclose the specific data referred to in the description as to how the new entrant profile assumption was developed		X	X	X	X
• Consider increasing the 1% of salary load for disability benefits			X		
Source: OAG summary of Cheiron’s preliminary reports to the five State-funded 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 five systems, found in chapters 2 through 6 of this report.

**Economic Assumptions**

Cheiron reviewed the economic assumptions utilized in the actuarial valuations for each of the five State-funded 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 five State-funded retirement systems. As can be seen in the exhibit, since 2010, each of the systems lowered its interest rate assumption.

Exhibit 1-2 <b>INTEREST RATE ASSUMPTIONS FOR THE FIVE STATE-FUNDED RETIREMENT SYSTEMS</b>		
<b>System</b>	<b>Interest Rate</b>	<b>Notes</b>
Teachers' Retirement System	8.00%	Lowered from 8.50% for the June 30, 2012 actuarial valuation
State Universities Retirement System	7.75%	Lowered from 8.50% for the June 30, 2010 actuarial valuation
State Employees' Retirement System	7.75%	Lowered from 8.50% for the June 30, 2010 actuarial valuation
Judges' Retirement System	7.00%	Lowered from 8.00% for the June 30, 2010 actuarial valuation
General Assembly Retirement System	7.00%	Lowered from 8.00% for the June 30, 2011 actuarial valuation

Source: Retirement system actuarial reports and experience studies.

Based on the evidence which the systems provided, Cheiron concluded that it was not comfortable with the interest rate assumptions used by three of the systems (TRS, SURS, and SERS). Cheiron noted that in last year’s State Actuary report to the Auditor General and the three systems, Cheiron recommended that the SERS, SURS, and TRS Boards consider lowering the interest rate for the June 30, 2013 valuation. None of the Boards reduced the interest rate assumption. In light of the evidence Cheiron presented in the individual system’s reports, Cheiron urged the Boards to lower the interest rate assumption for the upcoming June 30, 2014 actuarial valuation. If the Boards conclude that a reduction is not needed, Cheiron requested that the Boards provide substantial justification for maintaining the current interest rate.



Below are examples of the evidence cited by Cheiron to support its recommendation to lower interest rate assumptions for the upcoming June 30, 2014 valuations:

- **SERS – Cheiron recommended decreasing the interest rate assumption from 7.75 percent to 7.25 percent or lower for the upcoming 2014 valuation:** SERS’ actuary reported to the SERS Board in February 2013, that the expected average geometric return on SERS’ investments over the next 30 years, as developed by eight national investment consulting firms, is **7.09%**. The SERS actuary also noted **that the probability of meeting or exceeding the 7.75% assumption is 38.6%**. Cheiron concluded that selecting an assumption that has a 61.4% chance of not being met is unreasonable.

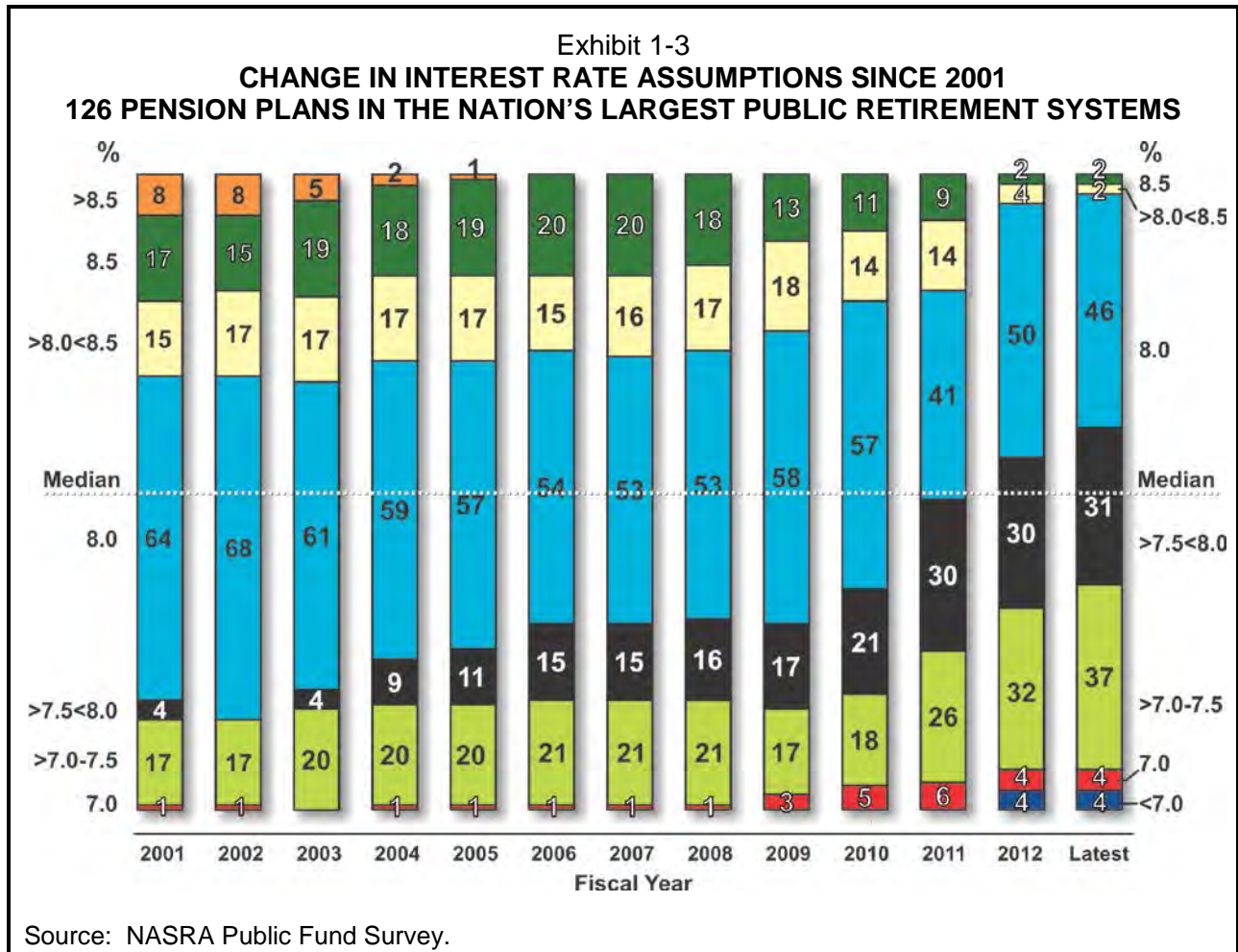
Cheiron also noted that the Judges’ Retirement System (JRS) and the General Assembly Retirement Systems (GARS) have their investments commingled with the SERS investments and managed as one large investment pool. Both JRS and GARS use a 7.0 percent interest rate assumption. It is not clear how a 7.75 percent assumption for SERS can be justified when a 7.0 percent assumption is used for the two other systems.

- **SURS – Cheiron recommended decreasing the interest rate assumption from 7.75 percent to 7.25 percent or lower for the upcoming 2014 valuation:** A 2013 review of SURS’ capital market assumptions showed an expected geometric return on the System’s portfolio to be **6.95 percent** over a 5- to 10-year time horizon. This expected return has declined 55 basis points since an earlier report in 2011. Furthermore, in SURS’ 2010 experience study, the system’s actuary relied on the opinion of nine independent investment consultants who provided that *the probability of exceeding 7.75 percent investment return each year was 44.59 percent*. Therefore, it can be inferred that for this assumption the expected average return rate based on the current asset allocation is lower than 7.75 percent.
- **TRS – Cheiron recommended decreasing the interest rate assumption from the current 8.00 percent.** TRS provided Cheiron with a one page analysis from its actuary that indicated an expectation of the average return over the next 30 years at 8.37 percent. However, the communication lacked any supporting documentation of assumptions to arrive at this value. Furthermore, the 8.37 percent expected rate of return contradicted the expectations of TRS’s investment consultant. The TRS investment consultant’s June 30, 2013 Investment Performance Review provided historic TRS returns that for all periods, except the one year and 20 year averages, with rates significantly below 8.0 percent. These lower actual returns are evidence to infer that expectations of a repeat of the 1990’s, which is included in the 20 year average, is not anticipated by investment consultants to be repeated. The 15 year average is 7.7 percent.

Cheiron recommended that the five Boards annually review the interest rate and inflation rate assumptions. Cheiron offered several different rationales for considering lowering the interest rate in future valuations. These included:

- A review of the interest and inflation rates does not involve the collection of significant data, and can easily be updated annually. In addition, it keeps the Boards focused more closely on these very important assumptions.
- The Statutory funding requirement cannot be ignored in the choice of an appropriate interest assumption. Fundamental to the Statute is the requirement to determine the appropriate portion of unfunded liability to be funded each year that produces a level amortization amount as a percent of future projected payroll. If the interest assumption is expected to result in a higher likelihood of returns below the rate than above, then by definition, this will produce lower than expected returns and an increasing amortization amount as a percent of payroll.
- The federal government, which promulgates minimum funding standards for corporate pension plans, already requires corporate pension plans to utilize interest assumptions that are based on short-term and mid-term bond rates, which are very low.
- *Pension Industry (actuarial, accounting, legal, and investment professional organizations) pressures may lead to mandated lower interest rates:* In recent years, there has been increased and controversial movement in the actuarial community that actuaries must move away from the traditional theory where the assumed interest assumption is based on expected plan earnings, and instead employ theories espoused by financial economists. Under financial economic theory, the interest rate used to value pension plan liabilities should be based on near risk free rates of return, because pension liabilities (or benefit payments) are considered more akin to bonds, and that using the higher expected earnings rates hides the risks of achieving that return. Near risk free rates of return today would be less than 4 percent and would enormously increase the liabilities of the systems and the resulting required State contribution. While this debate continues and has not been resolved, there are external signs that the public sector may ultimately be forced to utilize much lower investment assumptions.

Cheiron also 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 126 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 126 public pension plans.



The exhibit shows the shift to lower interest rate assumptions. In 2001, 104 of the 126 plans (83%) used an interest rate assumption of 8.0 percent or higher. The most recent data shows that this number has dropped to only 50 of 126 plans (40%) that use an interest rate of 8.0 percent or higher. The median assumption has fallen below 8.0 percent. Also, four plans have adopted a rate below 7.0 percent.

### **Inflation Assumption**

The inflation assumption primarily impacts the salary increase assumption. The five State-funded retirement systems use inflation assumptions ranging from 2.75 percent to 3.25 percent. Exhibit 1-4 shows the inflation assumptions for each of the five systems.

Exhibit 1-4 <b>INFLATION ASSUMPTIONS</b> <b>FOR THE FIVE STATE-FUNDED RETIREMENT SYSTEMS</b> <b>June 30, 2013 Valuation</b>		
<b>System</b>	<b>Inflation Rate</b>	<b>Notes</b>
Teachers' Retirement System	3.25%	Lowered from 3.50% for the June 30, 2012 actuarial valuation
State Universities Retirement System	2.75%	Lowered from 3.75% for the June 30, 2011 actuarial valuation
State Employees' Retirement System	3.00%	Lowered from 3.50% for the June 30, 2002 actuarial valuation
Judges' Retirement System	3.00%	Lowered from 4.00% for the June 30, 2011 actuarial valuation
General Assembly Retirement System	3.00%	Lowered from 4.00% for the June 30, 2011 actuarial valuation
Source: Retirement system actuarial reports and experience studies.		

Cheiron concluded that the inflation assumptions used by the five State-funded retirement systems were within a reasonable range. Cheiron's rationale for concurring with the inflation assumptions included:

- The 2013 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years) inflation will average somewhere between 1.8% and 3.8%.
- Cheiron's comparison of other public sector retirement systems' inflation assumptions as shown by surveys published by the National Conference on Public Employee Retirement Systems (NCPERS) and Boston College's Center of Public Research (CPR) show that most public sector pension plans utilize an inflation assumption in the range of 2.75 percent to 3.75 percent.

### **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 did, however, make a number of recommendations for additional disclosures for the 2013 valuations and also recommended changes for future valuations concerning various demographic assumptions. For example, Cheiron recommended that systems use a fully generational mortality table.

Also, for several years, the SERS, SURS, and TRS actuarial valuations have reported, but not fully explained, significant losses. Last year, Cheiron recommended that the three systems fully analyze and disclose the source of losses which have been occurring. However, corrective action was not taken by the three systems. This year, Cheiron again recommended that the losses be fully analyzed and, if possible, prefunded through an appropriate assumption.

- SERS: For several consecutive years, there have been significant losses due to retirees from active status which the SERS actuary has explained as being an

“extraordinary event which would be difficult to predict in the future.” In the 2013 valuation, the experience loss was \$146 million (in 2012 it was \$395 million). Given that this event has happened for at least six consecutive years, Cheiron believes that additional analysis and more thorough disclosure is required to help determine the source of these losses.

- **SURS:** For the past several years, there have been recurring losses for benefit recipients. In the 2013 valuation, the loss was \$31.2 million. Cheiron believes that additional analysis and more thorough disclosure is required to help determine the source of these losses.
- **TRS:** For several consecutive years, there have been significant losses identified in the item Loss due to all other causes in the gain loss section of the actuarial valuation report. In the 2013 valuation, the loss was \$254 million. Cheiron believes that additional analysis and more thorough disclosure is required to help determine the source of these losses. The source should be quantified and addressed within the assumptions.

As shown previously, Exhibit 1-1 summarizes the recommendations made for the various retirement systems. Additional details on the demographic assumptions examined can be found in the chapters for each of the five State-funded retirement systems.

**PROPOSED CERTIFICATION OF REQUIRED STATE CONTRIBUTION**

As required by Public Act 097-0694, each of the five State-funded 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 behind the 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 2015.

Exhibit 1-5 AMOUNTS OF STATUTORILY REQUIRED STATE CONTRIBUTIONS	
System	State Contribution (for Fiscal Year 2015)
Teachers’ Retirement System	\$ 3,412,878,000
State Universities Retirement System	1,544,200,000
State Employees’ Retirement System	1,748,430,000
Judges’ Retirement System	133,982,000
General Assembly Retirement System	15,809,000
<b>Total</b>	<b>\$6,855,299,000</b>

Source: 2013 retirement system actuarial valuation reports.

Cheiron did, however, recommend that the systems’ actuaries disclose additional information in future valuation reports. To calculate the required State contribution, the systems’ actuaries must make an assumption regarding the new hires that replace existing members over

the projection period. This assumption is commonly referred to as the new entrant profile. The new entrant profile is a critical assumption as the required projection of 90 percent funding in 2045 means that the majority of active members at that time will be new hires after the current June 30, 2013 valuation.

Cheiron recommended that the systems' actuaries disclose additional information as to how the new entrant profile was developed and include all relevant information in their valuation reports to better comply with Actuarial Standard of Practice No. 41 *Actuarial Communications*.

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## ACTUARIAL METHODS

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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.

Information presented in this report is based on State statute in effect at June 30, 2013 and does not take into consideration any effect of Public Act 98-599, signed by the Governor on December 5, 2013.

### Funding Method

All of the five State-funded 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 affect. The NASRA Public Fund Survey indicates that only 15 of the 126 public pension plans (12%) use the PUC cost method. It should also be noted that the EAN method will be the required method to calculate liability for the new 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 in the actuarial value of assets. 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 five 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 (smoothed value) and the market value of assets. Many public sector pension plans limit the actuarial value of assets to, in any year, no more than 120 percent of market value or no less than 80 percent of market value. In fact, the Internal Revenue Service (IRS) mandates this "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 much sounder actuarial practice. According to Actuarial Standard of Practice No. 44 *Selection and Use of Asset Valuation Methods for Pension Valuations* 3.3(b)(1), the actuarial value of assets should ". . . fall within a reasonable range around the corresponding market values." Therefore, Cheiron recommended that the Boards consider moving to this approach in future valuations. Cheiron also noted that a move to this approach would have no impact on the 2013 actuarial valuation results as the actuarial value of assets for all five systems is currently within the 80 percent to 120 percent corridor. The systems have indicated that the current method is prescribed in statute and that a change would require legislative action.

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## **OTHER ISSUES**

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Cheiron raised three other issues in its reports to the retirement systems. The first issue related to the State mandated funding method, the second issue related to the State mandated projection method, and the third was a status review of the systems' preparation for the implementation of the new GASB Standards Nos. 67 and 68.

### **State Mandated Funding Method**

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 issues with this funding method.

- In SURS' June 30, 2013 actuarial valuation report, SURS' actuary comments that the current funding policy defers funding which puts the system at risk that benefit obligations will not be met. They recommend a funding policy based on 100 percent funding within thirty years.

- In the actuarial valuations for SERS, GARS, and JRS, the actuary advises “strengthening the current statutory funding policy” and provides the following examples:
  - a. Reducing the projection period needed to reach 90 percent funding;
  - b. Increasing the 90 percent funding target;
  - c. Separating the financing of benefits for members hired before and after December 31, 2010; and
  - d. Changing to an Annual Required Contribution based funding approach with an appropriate amortization policy for each respective tiered benefit structure.
  
- In its transmittal letter with TRS’ June 30, 2013 actuarial valuation report, TRS’ actuary clearly states their criticism over the fact that the required State contribution to TRS is limited by the Illinois Pension Code (40 ILCS 5/16-158) which, in their opinion, results in a deficient contribution from an actuarial point of view. The Pension Code requires that the actuary base the required contribution using a prescribed funding method that achieves a 90 percent funding in the year 2045. TRS’ actuary’s opinion is that the minimum contribution level should be 100 percent funding within thirty years.

Cheiron concluded that **this funding method does not meet actuarial standards of practice because the systems are not targeted to be funded at 100 percent and the funding of the plans is pushed back to later years. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of the systems.** Furthermore, based on the systems’ 2013 actuarial valuation reports, the funded ratio of the systems ranged from 41.5 percent (SURS) to 16.2 percent (GARS) based on the actuarial value of assets as a ratio over the actuarial liability. Cheiron has concerns about the solvency of the systems if there is a significant market downturn. **Cheiron suggests, due to the systematic underfunding of the systems, that the systems’ Boards always use the conservative end of any range of assumptions recommended by their actuaries. Cheiron also recommended stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.**

### **State Mandated Projection Method**

Cheiron noted that under the Pension Code, the actuarial methodologies utilized in performing the 2045 projection of the systems’ funded status assume that the future earnings rate is applied to the actuarial value of assets (smoothed value) rather than the market value of assets. If the actuarial value of assets (smoothed value) is higher than the market value of assets, the assets of the system would have to earn a much higher rate of return than what was projected. Cheiron recommended that consideration be given to requiring that the projected future earnings of the systems be based on the starting market value of assets rather than the smoothed value of assets.

### **Preparation for GASB 67 and 68**

The Governmental Accounting Standards Board (GASB) adopted Statement No. 67 (GASB 67) *Financial Reporting for Pension Plans—an amendment of GASB Statement No. 25* and Statement No. 68 (GASB 68) *Accounting and Financial Reporting for Pensions—an*



*amendment of GASB Statement No. 27.* GASB 67 is effective for periods beginning after June 15, 2013 and GASB 68 is effective for fiscal years beginning after June 15, 2014. The following is a brief summary of some of the changes contained in these Statements:

- The total pension liability will be calculated using the individual entry age actuarial cost method.
- A new blended discount rate assumption will be based on (1) a long-term expected rate of return on pension plan investments to the extent that assets are projected to be sufficient to pay benefits based on future contributions intended to finance current member benefits (i.e., excluding normal cost contributions for new entrants) and (2) a tax-exempt, high-quality municipal bond rate to the extent that the conditions for use of the long-term expected rate of return are not met. This will likely mean the discount rate will be reduced if projected contributions plus assets are not able to cover projected pension benefits.
- The unfunded actuarial liability, now called net pension liability, will be calculated using the market value of assets instead of the smoothed actuarial value of assets.
- The entire net pension liability will be recognized immediately on the employer’s statement of net position.
- The annual required contribution (ARC) has been eliminated.
- Recognition periods of unexpected changes in net pension liability would vary depending upon the source for the change. These periods would be immediate for plan changes, five years for the difference between projected and actual investment earnings, and expected working lifetime of both active and inactive members for other total pension liability changes.

Cheiron reviewed each of the systems’ strategy for implementing GASB 67 and 68. For the most part, the systems were in the early planning stages of implementing the new Standards. All five systems had established implementation dates for GASB 67; only SURS specified an implementation date for GASB 68. Some systems had decided what discount rates and allocation methods to use for net pension liability; others were still in the process of exploring these issues. Chapters 2 through 6 of this report contain additional details regarding each of the systems’ implementation plans.

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## **RESPONSES TO THE RECOMMENDATIONS**

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Each of the five State-funded 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.



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**Chapter Two****PRELIMINARY REPORT ON THE  
TEACHERS' RETIREMENT  
SYSTEM**

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In accordance with Public Act 097-0694, 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 December 4, 2013. The preliminary report was based on Cheiron's review of actuarial assumptions included in TRS' 2013 Actuarial Valuation.

Following is Cheiron's final preliminary report on the Teachers' Retirement System. TRS' written response, provided on December 16, 2013, can be found in Appendix C.



December 19, 2013

Mr. William G. Holland  
Auditor General  
740 East Ash Street  
Springfield, Illinois 62703

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

Dear Ladies and Gentlemen:

In accordance with Public Act 097-0694 Cheiron is submitting this preliminary report concerning the proposed certification prepared by the Buck Consultants (Buck) of the required State contribution to the Teachers' Retirement System of the State of Illinois (TRS) for Fiscal Year 2015. This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices, which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**In summary, our review of the assumptions and methods used in the June 30, 2013 Actuarial Valuation, which were used to determine the required Fiscal Year 2015 State contribution, found that while most of the assumptions were reasonable individually, we are not comfortable with the continued use of an 8.0% interest rate assumption for reasons explained in this report.** In our 2012 report to the Auditor General and TRS, we recommended that the TRS Board consider lowering the interest rate for this 2013 valuation. The Board did not reduce the interest rate assumption. In light of the evidence we present in this report, we now urge the Board to lower the assumption for the upcoming June 30, 2014 Actuarial Valuation. If the Board concludes that a reduction is not needed, we request that TRS provide substantial justification for maintaining the current interest rate. We also have some other recommended changes for the Board to consider in future valuations. Details on our recommendations can be found in the report that follows. Please provide written responses to our recommendations by close of business on December 16, 2013.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings. Section III provides the supporting analysis for those findings, and presents more details on our assessment of the actuarial assumptions and methods employed in Buck's actuarial certification, as well as our assessment of Buck's determination of the Required State Contribution for Fiscal Year 2015. Finally, in Section III, we comment on other issues impacting the funding of the Teachers' Retirement System, including the implications of Article 16 of the Illinois Pension Code, which establishes the statutory funding requirements for the System. **In our opinion the statutory mandated minimum**



**funding requirements call for inadequate funding, and do not meet generally accepted actuarial standards of practice.**

In preparing this report, we relied on information (some oral and some written) supplied by the Teachers' Retirement System of the State of Illinois (TRS) and Buck. This information includes actuarial assumptions and methods adopted by the TRS Board, plan provisions, summarized census data, the draft 2013 Actuarial Valuation Report, 2011 formal Experience Study, June 30, 2013 Investment Performance Review, 2012 CAFR, and various studies and memos prepared by the System's advisors and Executive Director. A detailed description of all information provided for this review is contained in the body of our report.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,  
Cheiron



Kenneth A. Kent, FSA, FCA, EA, MAAA  
Principal Consulting Actuary



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

**THE STATE ACTUARY'S PRELIMINARY REPORT ON THE  
TEACHERS' RETIREMENT SYSTEM OF THE STATE OF ILLINOIS  
UNDER PUBLIC ACT 097-0694**

**SECTION I - REPORT SCOPE**

Under Illinois Public Act 097-0694 (the Act) Cheiron, as the State Actuary, is required to review the actuarial assumptions and valuation of the Teachers' Retirement System of the State of Illinois (TRS) and issue this preliminary report to the TRS Board on the proposed certification prepared by Buck Consultants (Buck) of the required State contribution for Fiscal Year (FY) 2015. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the TRS Board to consider before Buck, the TRS actuary, finalizes their certification of the required State contributions to TRS for FY 2015. In accordance with the Act, our review did not include a replication of the actuarial valuation results.

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 Buck.

In conducting this review, Cheiron reviewed the draft June 30, 2013 actuarial valuation prepared by Buck, as well as Buck's Experience Study which included experience investigation of the demographic and economic experience for TRS for the period July 1, 2006 through June 30, 2011. We received and reviewed various presentations, formal studies, and memorandum prepared by Buck, RV Kuhns (TRS investment consultant), and TRS staff. We will address the September 6, 2013 letter from the TRS Board accepting Buck's recommendation to eliminate the census data lag beginning for this valuation cycle. The materials we reviewed are listed in Appendix B.

Finally, 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, consistent with our initial report, we continue to interpret actuarial practices to mean: (1) does the Board utilize a qualified actuary to prepare the annual actuarial valuation which determines the required State contribution; and (2) does the Board require the actuary to conduct periodic formal experience studies to justify the assumptions used in the actuarial valuations? In addition we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2013 actuarial valuation. Future reports may examine additional actuarial practices of the Board.

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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, 2013 Actuarial Valuation Report of TRS. Section III of this report provides detailed analysis and rationale for these recommendations.

**Assessment of Actuarial Assumptions Used in the 2013 Valuation:**

- 1) Public Act 097-0694 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 Teachers' Retirement Systems' draft 2013 Actuarial Valuation Report and conclude that while most of the assumptions are reasonable in general, based on the evidence we present in this report, we are not comfortable with the continued use of an 8.0% interest rate assumption. In the 2012 report to the Auditor General and TRS, we recommended that the TRS Board consider lowering the interest rate for this 2013 valuation. We now urge the Board to lower the assumption for the upcoming June 30, 2014 actuarial valuation. If the Board concludes that a reduction is not needed, we request TRS provide substantial justification for maintaining the current interest rate.

**Recommended Additional Disclosures for the 2013 Valuation:**

- 2) We recommend that Buck include the normal cost development in all projections. These projections should show normal cost by Tier. This information is necessary for another qualified pension actuary to appraise the reasonableness of the report as required by ASOP 41 Section 3.2.
- 3) We recommend Buck disclose in the valuation report a detailed breakdown of the actuarial liabilities separately for each participant class among participants in pay status, those inactive participants with deferred vested benefits, and active participants in their June 30, 2013 report. We also believe this information, broken down by Tier, would be valuable to demonstrate the implications of the benefit changes implemented under Tier 2 in 2011.
- 4) We recommend Buck include a reconciliation in this year's report of the implication of the census data lag recommended in their September 6, 2013 letter and adopted by the Board for the inactive data. It is our understanding that the inactive data used for this valuation was the same data used in the 2012 valuation and brought forward in a similar manner as applied for active data which was already subject to the lag. However, as with any method or assumption change, the implications should be explicitly quantified in the report. For example, it is unclear why there are differences in the total number of retirees and the benefits payable from last year to this year if the same inactive data used in the 2012 valuation was used again for the 2013 valuation. Also, the report should show a demonstration of how the prior year's data is brought forward to represent a proxy for the valuation as inferred in the *Liability Adjustment* statement made in the assumptions section of the valuation report.
- 5) The change in the treatment of Federal Funds contribution rate should be expanded to allow any users of this report to clearly understand the rationale and implications of this change.



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**SECTION II - SUMMARY OF RECOMMENDATIONS**

The description of this source of funds is not discussed in the body of the report and is unclear in the cover letter.

- 6) For several consecutive years there have been significant losses identified in the item *Loss due to all other causes* in the gain loss section of the report. We believe that additional analysis and more thorough disclosure is required and will help determine the source of these losses. The source should be quantified and addressed within the assumptions. This same recommendation was made last year, but no evidence of additional analysis is included in the draft June 30, 2013 valuation report. We strongly recommend the source for this loss be explained and, if possible, prefunded through an appropriate assumption.
- 7) There are also a number of assumptions that require additional disclosure to comply with ASOP 41: the active participant mortality table should be more completely described and the administrative expense rate should be specifically identified in the assumptions for the year.

**Recommended Changes for Future Valuations:**

- 8) We recommend that the TRS Board annually review economic assumptions (interest rate and inflation) each year prior to the valuation work and adjust assumptions accordingly.
- 9) We recommend again, as we did last year, that Buck consider, in future valuations, establishing a corridor around the market value of assets of 80% to 120% beyond which the actuarial value is limited given the use of the actuarial value of assets in the projection methodology in accordance with Public Act 96-0043. While this change would have no impact on the System for the June 30, 2013 valuation, we believe it would be better to establish this corridor before it is actually applicable.
- 10) We recommend Buck provide a draft report for this review process and include changes subsequent to the State actuary's review in the final report instead of a supplement, so that any future users of the report will have the benefit of the changes included within a single document.
- 11) We have several minor recommendations to the report including full disclosure of assumptions with respect applicability of 415(b) benefit limits and 401(a)(17) compensation limits applicable to Tier 1 participants, in performance of the valuation. These recommendations appear in Section III, supporting analysis.

**Proposed Certification of the Required State Contribution:**

- 12) Buck has determined that the FY 2015 required State contribution calculated under the current statutory funding plan is \$3,412,878,000. We have verified the arithmetic calculations made by Buck to develop this required State contribution and reviewed the assumptions on which it is based. In verifying these calculations, we have accepted Buck's annual projections of future payroll, total normal costs, benefits, expenses, and total contributions. **We continue to recommend that Buck disclose in the June 30, 2013 valuation an explicit development of the required State contribution for FY 2015,**

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**SECTION II - SUMMARY OF RECOMMENDATIONS**

**showing all sub-components.** This would include the normal costs and actuarial liabilities broken out by Tiers 1 and 2. **We also request Buck disclose in the June 30, 2013 valuation and later valuations** the following items to allow us to perform a more comprehensive analysis of the required State contribution – without this information we have to continue to rely on supplemental information provided to us that should be contained within the report to substantiate the certifications. The additional information needs to include the following:

- Projections by year of future benefit payouts broken out for actives and current inactive (i.e. retirees, beneficiaries, disabled, and terminated vested);
- Projections by year of future Gross TRS normal costs and member contributions in dollar amounts by year and by Tier;
- Projection by year of the expenses; and
- The present value of future benefits as of the valuation date for actives, terminated vested, retirees and beneficiaries, and disabled members by Tier.
- Last year we requested all projections show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date. This has not been done and we request it be included to support the certification.
- Include historic details on the projections of the maximum contribution calculation without General Obligation Bonds (GOB) in order for us to verify the numbers. There is no development of the Required Employer Costs before offset for the GOB debt service. The report should demonstrate the development of the actuarial value of assets without the GOB as a starting point.

**State Mandated Funding Method:**

- 13) The current statutory funding plan calculates the minimum contribution to TRS for each fiscal year as the amount sufficient to cause the total assets of the System to equal 90% of the total liabilities of the System by the end of Fiscal Year 2045. **This funding method does not meet actuarial standards of practice because the system is not targeted to be funded at 100% and the funding of the plan is pushed back to later years. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of TRS.** Based on the draft 2013 valuation report, the funded ratio is only 40.6% based on the actuarial value of assets as a ratio over the actuarial liability. We have concerns about the solvency of the System if there is a significant market downturn. **We do not necessarily agree with the alternative funding approaches Buck describes as they are insufficiently described in the letter and valuation report. We do, however, call for the TRS Board to take the steps they can to strengthen the funded status within the**

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**Illinois Pension Code by always using the conservative end of any range of assumptions recommended by Buck. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.**

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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.

**A. Economic Assumptions**

*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 changed to 8.0% from 8.50% for the plan year ending June 30, 2012. The change was adopted by the Board at the TRS Board meeting on September 21, 2012. The TRS actuary, Buck Consultants, had performed a formal study of all assumptions used in the actuarial valuation, called *Investigation of Demographic and Economic Experience*. The study, which was issued in August of 2012, covered the period July 1, 2006 through June 30, 2011. With respect to the investment assumption, Buck recommended the Board change the assumption from 8.5% to some figure in the range of 7.75% to 8.25%.

**After reviewing all the materials (see Appendix B of the report) that were made available, Cheiron recommends the TRS Board lower the interest rate assumption from 8.0% for the upcoming June 30, 2014 valuation. If the Board concludes that a rate reduction is not needed, we request that TRS substantial justification for maintaining the current interest rate, in light of the evidence we present below (Recommendation #1).**

*Our rationale for this recommendation is as follows:*

- While TRS's response to our report last year when we made the same recommendation was that the 8% interest rate has at least a 50/50 chance of being achieved, this ignores the impact of annual volatility of returns. This year we were provided a one page analysis from Buck that indicated their expectation of the average return over the next 30 years at 8.37%. However, the communication lacked any supporting documentation of assumptions to arrive at this value and contradicts the expectations (see below) of TRS's investment consultant. Also, the expected earnings for the plan assumed by Buck are higher than any other pension fund investment advisor we have seen. While this year's report by Buck illustrated a number of alternative measurements for appropriate funding to demonstrate the weakness in the current law, the TRS Board could avail itself of strengthening the funding discipline by adopting a more conservative stance regarding this assumption to achieve a better funding result.
- The RV Kuhn's June 30, 2013 Investment Performance Review (p. 15) provided historic TRS returns that for all periods, except the one year and 20 year averages, with rates significantly below 8.0%. These lower actual returns are evidence to infer that, expectations of a repeat of the 1990's, which is included in the 20 year average, is not anticipated by investment consultants to be repeated. The 15 year average is 7.7%.

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**SECTION III - SUPPORTING ANALYSIS**

- Performing a certification based on the theory of an average return rate means there is an equal probability that the certification is an under or overstatement of the minimum requirement, and over time as you get closer to the target date of 2045, it will be increasingly difficult to make up any shortfall.
- Under the new GASB Statements 67 and 68 TRS has presented to us that they may need to disclose the Net Pension Liabilities based on a rate of 6.94% in accordance with the System's initial estimates.
- Buck, in their draft June 30, 2013 valuation, is reporting a funded ratio (actuarial value of assets over actuarial liabilities) of 40.6%, which indicates the plan will require significant future funding. Even though a more realistic assumption would drop that ratio below 40%, it would also require expedited funding of the System going forward.
- Buck adhered to Actuarial Standards of Practice (ASOP No. 27) in developing the interest rate assumption by selecting a best-estimate range for the assumption. However, other appropriate factors, such as expectations for the existing asset allocation, current funded status, and the likelihood of the State appropriations only being extended to meet the statutory minimum funding, should also be considered.
- In the cover letter and body of the June 30, 2013 valuation report, Buck illustrated two alternative funding approaches. While there was no formal discussion of these illustrations, we anticipate that they were included to demonstrate the weak funding standard required as the State minimum. While these alternatives cannot be mandated, the change to a more conservative interest rate assumption can be applied to address the concerns around the minimum funding policy.
- The Statutory funding requirement cannot be ignored in the choice of an appropriate interest rate assumption. Fundamental to the Statute is the requirement to determine the appropriate portion of unfunded liability to be funded each year that produces a level amortization amount as a percent of future projected payroll. If the interest assumption is expected to result in a higher likelihood of returns below the rate than above – as presented in the RV Kuhns Investment Performance Review for the period ending June 30, 2013 and their 20 year performance values – then by definition, this will produce future losses and an increasing amortization amount as a percent of payroll.

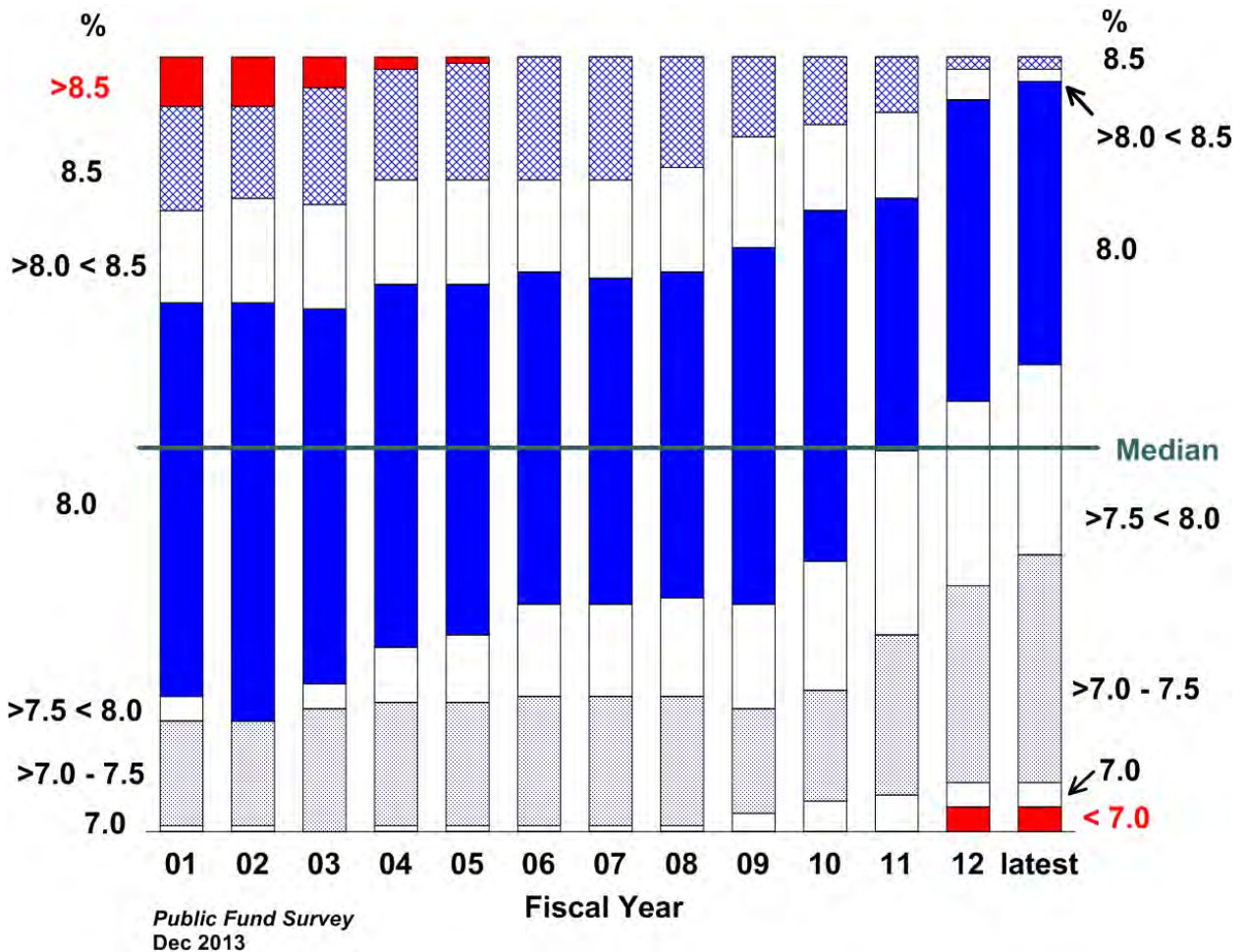
**We continue to recommend, as we did last year, that the Board annually review the interest assumption as opposed to waiting for the completion of a formal Experience Review study (Recommendation #8).**

*Our rationale for this recommendation is as follows:*

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- A review of the interest and inflation rates does not involve the collection of significant data, and can easily be updated annually. In addition, it keeps the Board focused more closely on these very important assumptions.
- The National Association of State Retirement Administrators (NASRA) conducts an annual survey of public funds. The latest Public Fund Survey covers 126 large retirement plans. The following chart shows the distribution of investment return assumptions for the last 12 years of their survey. The latest data includes results collected through December 2013.



Over the period shown in the latest survey, there continues to be a pattern of reducing investment return assumptions. 42 of the 126 plans have reduced the interest rate assumption since the Fiscal Year 2011. Of the nine plans in the survey that indicate an interest rate reduction since Fiscal Year 2012, the median reduction is 0.43%. The survey is consistent with experience of other Cheiron clients, with which there has been a significant trend to reduce the investment return assumptions in the last three years.

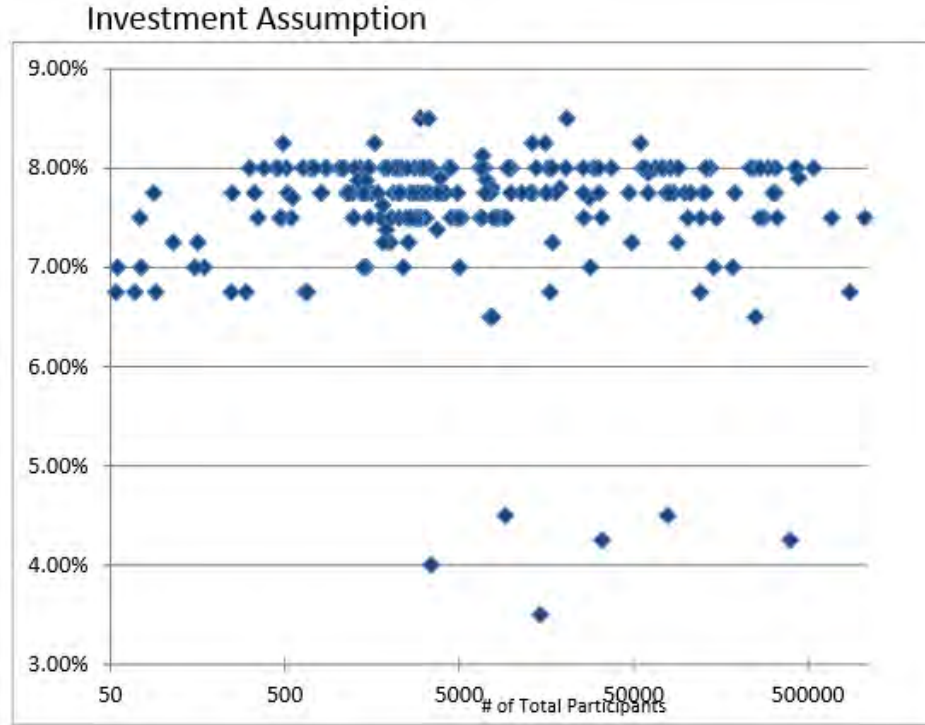
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- *Pension Industry (actuarial, accounting, legal, and investment professional organizations) pressures may lead to mandated lower interest rates:* In recent years, there has been increased and controversial movement in the actuarial community that actuaries must move away from the traditional theory where the assumed interest assumption is based on expected plan earnings, and instead employ theories espoused by financial economists. Under financial economic theory, the interest rate used to value pension plan liabilities should be based on near risk free rates of return, because pension liabilities (or benefit payments) are considered more akin to bonds, and that using the higher expected earnings rates hides the risks of achieving that return. Near risk free rates of return today would be less than 4% and would enormously increase the liabilities of TRS, and the resulting required State contribution. While this debate continues and has not been resolved, there are external signs that the public sector may ultimately be forced to utilize much lower investment assumptions.
- Industry pressures have heightened over the last year with concerns over Federal intervention that could result in mandated lower interest rates. The best way to address these pressures is through independent action by the TRS Board to continuously review and reduce the interest rates that are not just sustainable on average but provide confidence levels of asset return consistently delivering returns to equal or exceed the expectations at levels greater than 50% of the time.
- New GASB 67 and 68 pronouncements will require many public pension plans, such as TRS, to use a lower interest rate for accounting disclosures and pension expense determinations in fiscal years 2014 and 2015 respectively. It's important to note, however, that the new standards do not define funding requirements for a plan.
- Moody's, an organization that provides bond rating information for private investors, has recently announced that they propose to compare the financial viability of public sector pension plans by using, among other things, a 5.67% interest rate assumption.
- The federal government, which promulgates minimum funding standards for corporate pension plans, already requires corporate pension plans to utilize interest assumptions that are based on short-term and mid-term bond rates, which are very low.
- The following chart from page 11 of the October 2013 *National Conference on Public Employees Retirement Systems (NCPERS) Public Fund Study* shows the rates used nationwide by public sector pension plans.

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As part of the study, NCPERS identified that the average investment assumption for the 241 state and local pension plan respondents was 7.6%, a decrease from last year's value of 7.7% and estimating that 40% have reduced this assumption compared to the 2012 study.

2. *Inflation Assumption:*

The inflation assumption, which primarily impacts the salary increase assumption used by TRS, was changed to 3.25% from 3.5% for the plan year ending June 30, 2012. The change was adopted by the Board at the TRS Board meeting on September 21, 2012.

**We find that Buck's recommended 3.25% inflation assumption used in certifying the required State contribution is reasonable. However, this assumption should be reconsidered if a reduction is made to the interest rate assumption (Recommendation #8).**

*Our rationale for concurring with the 3.25% assumption is as follows:*

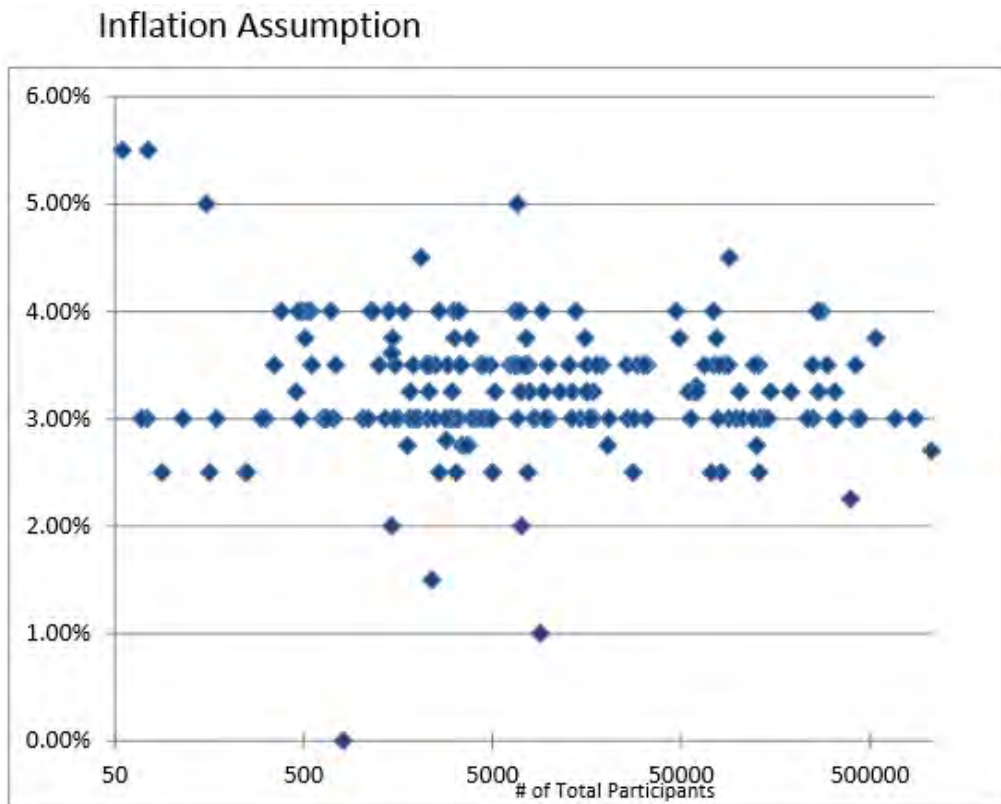
- The 2013 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years) inflation will average somewhere between 1.8% and 3.8%.



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- As shown on page 9 of Buck's August 23, 2012 presentation to the TRS Board, recent experience (2007 through 2011) has been 2.2%.
- Our comparison of other public sector retirement systems' inflation assumptions as shown by surveys published by Boston College's Center of Public Research (CPR) shows that most public sector pension plans utilize an inflation assumption in the range of 2.75% to 3.75%.
- *A National Conference on Public Employers Retirement Systems (NCPERS) 2013 study* provided the following graphic of respondents' inflation assumptions:



This shows that the 3.25% assumption, which TRS uses, is a common inflation assumption amongst the 241 systems who responded to this study. The average inflation rate assumption was 3.3% which is a decrease over last year when it was 3.5%. However, it is apparent there are a large number of systems using 3.00% for this assumption.

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*3. Salary Increase Assumption:*

For the June 30, 2013 actuarial valuation, the total salary scale increase assumption, which remains the same as it was in 2012, is shown in the table below:

<u>Salary Component</u>	<u>Amount</u>
Inflation	3.25%
Real Wage Growth	0.75%
Career Scale	1.75%*
<u>Employment Type and Status Changes</u>	<u>0.25%*</u>
<b>Total Salary Increase Assumption</b>	<b>6.00%</b>

\*Estimated, not explicitly broken out in the report

Buck includes the following listing of salary increases by age and included the requested merit or seniority components.

<u>Age</u> Male and Female	<u>Salary Increase</u>	
	Merit	Seniority
20	10.15%	6.15%
25	9.25%	5.25%
30	7.45%	3.45%
40	6.25%	2.25%
50	5.00%	1.00%
55	5.00%	1.00%
60	5.00%	1.00%
65	5.00%	1.00%

**We find this assumption and the basis for setting it as reasonable, unless there is a change to the inflation assumption (Recommendation #8).**

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

- In our own experience with our public sector pension plans (about 60 large plans), we have witnessed a consistent recent trend of declining salary increases for public sector employees which was addressed when the assumption was changed effective for the June 30, 2011 valuation.
- While there were material gains from lower salary growth than assumed this past year, this is a long term assumption with the expectation that salary growth will return to the long term trends expressed in the rates above.

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**B. Demographic Assumptions:**

For the draft June 30, 2013 actuarial valuation, Buck has maintained the same assumption changes used in the prior valuation.

Out of the demographic assumptions, we have recommendations for additional disclosure for two.

*1. Data Reconciliation:*

The 2013 actuarial valuation report includes a breakdown of gains and losses including those attributable to demographic changes as recommended in last year's report. We found this helpful in reconciling the changes in the unfunded liability from 2012 to 2013.

However, this year is the first year that Buck has realigned the data to use a one year census data lag in both active and inactive participant data. In the past the inactive data was based on TRS data as of the valuation date. Now this inactive data is also based on the information available one year earlier. This is explained in Buck's September 6, 2013 letter to the TRS Board, but neither the letter nor the draft 2013 Actuarial Valuation Report provides the quantitative impact of this procedural change. While we don't have a concern with this process for certification purposes, Buck is basically using the same inactive data for 2012 and 2013. The information presented beginning on page 1 of the draft June 30, 2013 Actuarial Valuation Report shows different values for the inactive data from last year to this year. There is no clear description of what process has been performed to account for these differences. In the assumption section there is a description of *Liability Adjustment* which may represent that there are updates made to the data for the one-year lag but this description lacks sufficient detail to allow another actuary to replicate the process.

**We recommend the report contain a demonstration of how the prior year's data is brought forward for valuation purpose to substantiate that there is no material distortion of the results, in particular with respect to Tier 2 participants (Recommendation #4).**

*2. Recurring Loss:*

We continue to find the *Loss due to all other* causes component to the reconciliation of gains and losses to overshadow most of the other sources and materially too large relative to the other gain loss sources to remain unexplained.

**We strongly recommend the source for this loss be explained and, if possible, prefunded through an appropriate assumption (Recommendation #6).**

**The other changed demographic assumptions first made in prior reports and continued in 2013 meet the Standards called for under ASOP No. 35, 3.3.4. Recently changed**

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Actuarial Standards of Practice (ASOP No. 35) now require that actuaries at least consider projections of mortality improvements, and if there is not such an assumption for improvement, the actuary must disclose the basis for not making the assumption. Based on the current assumptions, mortality improvements are being projected.

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Below, we summarize all the demographic assumptions which we reviewed and we've concluded all are reasonable. However, we have identified areas where additional disclosure is appropriate in accordance with our recommendations (Recommendation #11).

**1. Rates of Termination:**

Age	<u>Males</u>		<u>Females</u>	
	Non-vested	Vested	Non-vested	Vested
20	12.00%	8.00%	18.00%	10.00%
25	7.00	6.00	7.80	9.00
30	8.60	3.70	10.60	6.00
40	11.10	1.50	10.00	2.20
50	12.00	1.40	10.00	1.40
55	16.00	4.00	15.00	3.10
60	21.00	4.00	14.00	4.00
65	21.00	4.00	40.00	4.00
70	-	-	-	-

**2. Rates of Mortality:**

**a. Death before Retirement at Selected Ages  
(number of deaths per 100 members)\*:**

Age	Males	Females
20	0.023	0.011
25	0.029	0.011
30	0.035	0.013
40	0.061	0.031
50	0.122	0.069
55	0.183	0.116
60	0.303	0.219
65	0.531	0.395
70	-	-

*\* Beginning July 1, 2012, projected mortality improvements are phased in with the Society of Actuaries Mortality Projection Scale AA. The table above reflects this phase in, and shows representative values as of July 1, 2012.*

We recommend the specific table used for active mortality be disclosed in the report to comply with the ASOPs (Recommendation #7).

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- b. Death after Retirement:** For annuitants, the RP-2000 White Collar Table projected nine years using scale AA, with a two-year age setback from men and no age setback for women. Rates for women are further adjusted for ages 63-77 by 65% and ages 78-87 by 85%.

For beneficiaries, the RP-2000 blended table, projected nine years using scale AA, with a one-year age setback for both men and women.

For the period after disability retirement, the RP-2000 Disabled Table, projected nine years using scale AA, with a one-year age setback for both men and women.

Future generational rates are projected from 2009 based on scale AA.

**3. Rates of Disability (per 100 members)\*:**

<b>Age</b>	<b>Males</b>	<b>Females</b>
20	0.029	0.045
25	0.029	0.045
30	0.026	0.117
40	0.051	0.162
50	0.094	0.172
55	0.111	0.197
60	0.170	0.144
65	0.510	0.287
70	-	-

*\* A 2% load was placed on disability benefits to account for Occupational Disability benefits being greater than standard disability.*

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**4. Rates of Retirement:**

**a. For Members Hired before January 1, 2011  
(per 100 members):**

Age**	Service*				
	5 - 18	19 - 30	31	32-33	34+
54	-	6	12	38	40
55	-	10	20	38	40
56	-	7	16	38	32
57	-	7	16	38	32
58	-	7	13	38	32
59	-	25	34	45	31
60	14	27	45	45	31
61	14	24	30	45	31
62-63	14	26	36	45	31
64	20	33	36	45	31
65-67	23	33	45	45	31
68-69	27	33	45	45	31
70	100	100	100	100	100

\* Active member service rounded to nearest year on June 30 prior to retirement.

\*\* Age rounded to nearest year on June 30 prior to retirement.

**b. For Members Hired on or after January 1, 2011  
(per 100 members):**

Age**	Service*			
	19 - 30	31	32-33	34+
≤ 61	-	-	-	-
62	15	20	25	25
63	10	15	20	20
64	10	15	20	20
65	10	15	20	20
66	10	15	20	20
67	40	70	70	70
68	40	40	40	40
69	40	40	40	40
70	100	100	100	100

\* Active member service rounded to nearest year on June 30 prior to retirement.

\*\* Age rounded to nearest year on June 30 prior to retirement.

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**c. Utilization of Early Retirement Option (ERO) among All Active Service Retirees\*\*\*  
(per 100 members):**

Age**	Service*			
	19 - 30	31	32	33
54	68	90	49	22
55	75	79	53	25
56	66	75	45	17
57	63	71	48	15
58	64	69	46	14
59	23	27	28	13

\* Active member service rounded to nearest year on June 30 prior to retirement.

\*\* Age rounded to nearest year on June 30 prior to retirement.

\*\*\* ERO Utilization Rates are applied only to members who have less than 35 years of total service at the assumed retirement date (including assumed sick leave and optional service purchased at retirement). Based on the sick leave and optional service assumptions, the majority of members with 33 years of service at the beginning of the year of retirement will not be assumed to retire on ERO because they will be assumed to have at least 35 years of service at retirement. In addition, ERO Utilization Rates are not applied to members whose pension under the ERO program would be less than their money purchase benefit.

5. **Marital Data:** It is assumed that 85% of members are married and that the female spouse is three years younger than the male spouse. (Adopted effective June 30, 1993.)
6. **Growth in Active Membership:** For purposes of the projection required by State funding law, it is assumed that the active membership of the System will remain constant in number, with no change in the size of either the full-time/part-time group or the hourly/substitute group. (Adopted effective June 30, 1994.)
7. **Severance Pay:** For members hired before January 1, 2011, the percent of retirees from active service assumed to receive severance payments, and the amount of such severance payments, are assumed to be as follows

Percent of Retirees Who Receive Severance Pay	Severance Pay as a Percent of Other Pensionable Earnings in the Last Year of Employment
20%	6%

8. **Optional Service Purchases:** The pension benefit obligation 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.



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The amount purchased varies by the amount of regular service at retirement. Representative amounts purchased at retirement, and other assumptions used, are as follows:

<b>Regular Service at Retirement</b>	<b>Maximum Service Purchased</b>
10 years	0.473 years
20 years	0.835 years
25 years	1.360 years
30 years	1.040 years
34 or more	None

- a. Actual optional service credit for each current member is provided by TRS;
- b. No additional service purchases will be assumed for members who currently have optional service credit;
- c. Members will not purchase service if it does not improve their pension benefit; and
- d. 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.

The PBO covered by future member payments is not included in the liability on the valuation date, but is brought into projected liabilities as those payments are brought into the assets.

- 9. Unused and Uncompensated Sick Leave Service at Retirement:** Such credit varies by the amount of regular service at retirement. Representative assumed amounts of unused and uncompensated sick leave service are as follows:

<b>Regular Service at Retirement</b>	<b>Maximum Service Purchased</b>
20 years	1.035 years
25 years	1.847 years
30 years	1.454 years
34 years	1.000 years
35 or more	None

- 10. Administrative Expenses:** The administrative staff of the System estimates the expected administrative expenses for the fiscal year following the valuation. Total payroll for the same year is projected based on valuation assumptions and the expected administrative expenses are then expressed as a percent of total payroll. Administrative expenses in future years are then assumed to remain constant as a percent of total payroll. (Adopted effective June 30, 1994.)

**This rate should be explicitly disclosed in the valuation report (Recommendation #7).**

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**11. 2.2 Upgrade Assumption:** For those active members who have already made a payment to upgrade past service prior to June 30, their benefits are based on their upgrading at the valuation date. For all other active members, they are assumed to upgrade at retirement. (Adopted effective June 30, 1999.)

**12. Liability Adjustment:** 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 prior valuation date. In projecting results to account for the one-year difference in the census date and the valuation date, we made use of the valuation assumptions. To the extent that changes have occurred in the census from the date the census information is determined and the valuation date, we will work with TRS staff to determine if additional adjustments need to be made. Otherwise, any change in liability due to changes in census between the collection date of the census information and the valuation date will be captured in the next actuarial valuation.

**The implications of these adjustments should be demonstrated** how the prior year's data is brought forward to represent a proxy for the valuation **in the report numerically to allow for evaluation of the significance to resulting cost determination** (Recommendation #4).

**13. Future Payroll Assumption:** Future payroll is projected using the assumed decrements for the members in the system and the new entrant profile as described below:

**a. Distribution of New Entrants is as follows (based on 6/30/2009-6/30/2011 new hire counts):**

Age Group	Full Time/ Part Time			Hourly/ Substitute		
	Males	Females	Total	Males	Females	Total
20 – 24	5.4%	26.2%	31.6%	6.9%	18.1%	25.0%
25 – 29	7.7	24.6	32.3	8.2	15.1	23.3
30 – 34	3.6	10.3	13.9	2.7	6.0	8.7
35 – 39	1.8	5.6	7.4	2.0	6.6	8.6
40 – 44	1.4	3.9	5.3	2.7	9.4	12.1
45 – 49	0.8	3.3	4.1	1.8	6.2	8.0
50 – 54	0.6	2.0	2.6	1.6	3.9	5.5
55 – 59	0.6	1.3	1.9	1.7	2.7	4.4
60 – 64	0.3	0.4	0.7	1.4	1.6	3.0
65 – 69	0.1	0.1	0.2	0.6	0.5	1.1
70	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.2</u>	<u>0.1</u>	<u>0.3</u>
Total	22.3%	77.7%	100.0%	29.8%	70.2%	100.0%

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- b. Service Credit Earned in Each Future Year (Full Time/Part Time based on 6/30/2009-6/30/2011 new hire service credits and Hourly/Substitutes based on 6/30/2011 new hire service credits):**

Age Group	Full Time/ Part Time			Hourly/ Substitute		
	Males	Females	Total	Males	Females	Total
20 – 24	0.9917	0.923	0.922	0.311	0.336	0.335
25 – 29	0.947	0.934	0.937	0.309	0.298	0.298
30 – 34	0.909	0.915	0.913	0.340	0.276	0.297
35 – 39	0.930	0.916	0.920	0.288	0.301	0.300
40 – 44	0.931	0.901	0.908	0.252	0.308	0.298
45 – 49	0.900	0.905	0.904	0.304	0.317	0.312
50 – 54	0.888	0.928	0.919	0.321	0.338	0.334
55 – 59	0.972	0.903	0.926	0.353	0.345	0.346
60 – 64	0.893	1.113	1.010	0.328	0.330	0.327
65 – 69	-	-	-	0.315	0.304	0.308
70	-	-	-	0.285	0.255	0.268
Average	0.928	0.924	0.924	0.313	0.315	0.314

- c. Projected Annual Rate of Pay at 6/30/2012\***  
(for one year of service credit – Full Time/Part Time based on 6/30/2009-6/30/2011 new hire pay normalized to 6/30/2012 and Hourly/Substitutes based on 6/30/2011 new hire pay)

Age Group	Full Time/ Part Time			Hourly/ Substitute		
	Males	Females	Total	Males	Females	Total
20 – 24	\$ 46,349	\$ 45,029	\$ 45,254	\$ 17,475	\$ 18,053	\$ 17,893
25 – 29	47,771	48,290	48,167	17,467	17,374	17,407
30 – 34	55,110	52,482	53,163	17,704	16,908	17,155
35 – 39	57,001	54,980	55,472	16,839	16,595	16,652
40 – 44	64,467	55,424	57,812	16,616	15,919	16,075
45 – 49	68,190	55,885	58,286	16,348	16,192	16,227
50 – 54	74,055	56,203	60,323	16,806	16,281	16,434
55 – 59	68,428	68,443	68,438	16,095	16,233	16,180
60 – 64	77,237	58,749	66,672	15,935	16,183	16,067
65 – 69	-	52,933	26,466	15,841	15,565	15,716
70	-	47,386	-	15,783	14,993	15,520
Total	\$ 52,582	\$ 49,509	\$ 50,195	\$ 17,074	\$ 16,989	\$ 17,014

\* The rate of pay profile will increase 4.00% per annum. 3.25% of the increase is attributable to inflation and 0.75% to real wage growth.

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**We recommend, that the report provide some statement disclosing if or how 401(a)(17) compensation limits for Tier 1 active participants was applied in performing the valuation (Recommendation #11)**

**The treatment and/or application of the maximum allowable benefit limitations under 415(b) should also be disclosed in the report to determine if liabilities and cost reflect the application of the limits or such limitations cost impact is recognized at time of retirement (Recommendation #11).**

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**C. 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). Since the amortization basis is governed by State law, we do not comment on it here.

*1. Cost Method:*

The System uses the projected unit credit cost method (PUC) to assign costs to years of service, as required to under the Pension Code (40 ILCS 5/16). **We have no objections with respect to using the PUC method, although we, as Buck does, would prefer the Entry Age Normal (EAN) funding method as it is more consistent with Public Act 094-0004's requirement for level percent of pay funding (Recommendation #13).** 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 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 value increasing, while the PUC method is not an unreasonable method, more plans use the EAN funding method to mitigate this affect. It should also be noted that the EAN method will be the required method to calculate liability for GASB 67 & GASB 68.

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

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 (IRS) mandates this "corridor" for private sector pension plans (a 90%-110% corridor is mandated). Even though it is not mandated for public plans, we believe that the use of this type of

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corridor is a much 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 value." **Therefore, we recommend that the TRS Board consider moving to this approach in future valuations** (Recommendation #9). It's important to note that currently a move to this corridor approach would have no impact on the 2013 actuarial valuation results, as the actuarial value of assets is already within the 80%-120% corridor.

**D. Determination of the Required State Contribution**

As required by Public Act 94-0004, in determining the required State contribution under State law, the actuary must determine what level of future contributions is needed to make a projection of the System's funded status in 2045 be at 90%. To make that determination, the actuary needs to make an assumption regarding the age/sex/salaries of new hires that replace existing members leaving over this period. This assumption is commonly referred to as the "New Entrant Profile". In addition to making that assumption, the actuary needs to apply actuarial methodologies to project the June 30, 2013 valuation into the future.

The "New Entrant Profile" assumption is a critical assumption as the required projection of 90% funding in the year 2045 means that the majority of active members will be new hires after the current June 30, 2013 valuation. **Buck has disclosed additional information in their valuation report as to how the new entrant profile was developed, which is shown on pages 43 and 44 of their June 30, 2013 Actuarial Valuation.**

**We recommend that Buck revise this valuation to include items that would allow Cheiron or any actuary the ability to verify Buck's determination of the required State contribution** (Recommendation #12). The specific items missing in Buck's report that are needed are projections by year of:

- Future benefit payouts broken out for actives and current inactive (i.e. retirees, beneficiaries, disabled, and terminated vested (Recommendation #3)).
- Future Gross TRS normal costs and member contributions in dollar amounts by year and by Tier (Recommendation #2).
- Future expense component (Recommendation #7).

All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.

In addition we recommend Buck provide a disclosure of the present value of future benefits for actives, terminated vested, retirees and survivors, and disabled members.

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We believe these would be appropriate disclosures under ASOP No. 41 and that the additional information will allow us to perform a more comprehensive analysis of Buck's determination of the required State contribution.

**E. Other Issues**

*1. State Mandated Funding Method:*

In its transmittal letter, Buck clearly states their criticism over the fact that the required State contribution to TRS is limited by Illinois Pension Code (40 ILCS 5/16-158) which, in their opinion, results in a deficient contribution from an actuarial point of view. This Law requires that the actuary base the required contribution using a prescribed funding method that achieves a 90% funding in the year 2045. Buck's opinion is that the minimum contribution level should be 100% funding within thirty years in accordance with GASB 25 as well as generally accepted actuarial practices. **We concur with the concerns. We do not necessarily agree with the alternative funding approaches as they are insufficiently described in the letter and valuation report. We do, however, call for the TRS Board to take the steps they can to strengthen the funded status within the Illinois Pension Code by always using the conservative end of any range of assumptions recommended by Buck (Recommendation #13).**

*2. Federal Funds Contribution Amount:*

It is clear that this year the Federal Funds Contributions have declined. The change in the treatment of Federal Funds contribution rate should be expanded to allow any users of this report to clearly understand the rationale and implications of this change. The description of this source of funds is not discussed in the body of the report and is unclear in the cover letter.

The report should identify specifically what has changed this year, under what authority and whether this is a permanent change and likely to remain at the rate disclose this year or be subject to additional changes in the future (Recommendation #5).

*3. State Mandated Projection Method:*

Under Public Act 96-0043, the actuarial methodologies utilized in performing the 2045 projection of the System's funded status assume the future earnings rate (currently at 8%) is applied to the actuarial value of assets (AVA) rather than the market value of assets (MVA).

The following table demonstrates what the market value would have to earn in order for the actuarial value to earn 8.0% based on the ratio of actuarial value to market value. We recommend that consideration be given to require that the projected future earnings of the System be based on starting market values of assets (rather than a smoothed value).

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**What the market value of assets (MVA) would need to earn in a given year, if the actuarial value of assets (AVA) are assumed to earn 8.00%, at various ratios of**

<u>Ratio of AVA to MVA</u>	<u>Required MVA Return</u>
<b>133.00%</b>	<b>87.20%</b>
<b>130.00%</b>	<b>80.00%</b>
<b>125.00%</b>	<b>68.00%</b>
<b>120.00%</b>	<b>56.00%</b>
<b>115.00%</b>	<b>44.00%</b>
<b>110.00%</b>	<b>32.00%</b>
<b>105.00%</b>	<b>20.00%</b>
<b>100.00%</b>	<b>8.00%</b>
<b>95.00%</b>	<b>-4.00%</b>
<b>90.00%</b>	<b>-16.00%</b>
<b>85.00%</b>	<b>-28.00%</b>
<b>80.00%</b>	<b>-40.00%</b>
<b>75.00%</b>	<b>-52.00%</b>
<b>70.00%</b>	<b>-64.00%</b>

**F. Preparations for GASB 67 & 68**

The Governmental Accounting Standards Board (GASB) adopted Statement No. 67 (GASB 67) **Financial Reporting for Pension Plans—an amendment of GASB Statement No. 25** and Statement No. 68 (GASB 68) **Accounting and Financial Reporting for Pensions—an amendment of GASB Statement No. 27**. GASB 67 is effective for periods beginning after June 15, 2013 and GASB 68 is effective for fiscal years beginning after June 15, 2014. The following is a brief summary of some of the changes contained in these statements:

- The Total Pension Liability will be calculated using the individual entry age actuarial cost method.
- A new blended interest rate assumption will be based on (1) a long-term expected rate of return on pension plan investments to the extent that assets are projected to be sufficient to pay benefits based on future contributions intended to finance current member benefits (i.e., excluding normal cost contributions for new entrants) and (2) a tax-exempt, high-quality municipal bond rate to the extent that the conditions for use of the long-term



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expected rate of return are not met. This will likely mean the interest rate will be reduced if projected contributions plus assets are not able to cover projected pension benefits.

- The Unfunded Actuarial Liability, now called Net Pension Liability, will be calculated using the market value of assets instead of the smoothed actuarial value of assets.
- The entire Net Pension Liability will be recognized immediately on the employer's statement of net position.
- The Annual Required Contribution (ARC) has been eliminated. The new Pension Expense which equals: Normal Cost + Interest Cost - Expected Asset Earnings + Amortization of changes in total pension liability +/- five year differences on the actual vs. expected asset returns.
- Recognition periods of unexpected changes in net pension liability would vary depending upon the source for the change. These periods would be immediate for plan changes, five years for the difference between projected and actual investment earnings, and expected working lifetime of both active and inactive members for other total pension liability changes.

We have reviewed the System's strategy for implementing GASB 67 and 68 which is summarized below.

- 1. The implementation, reporting, measurement and valuation dates for GASB 67 and 68**
  - TRS will implement GASB 67 for their Fiscal Year 2014 (July 1, 2013 – June 30, 2014) Comprehensive Annual Financial Report.
  - TRS did not specify a date planned to implement GASB 68.
  - TRS has determined the valuation date to be one year prior to the year-end financial statements with participant data to be one year prior to the measurement date for GASB 67 & GASB 68.
  
- 2. The method that will be used to develop the annual financial reporting**

TRS has already conferred internally with the System's comptroller and has plans to reach out to the actuary, external auditors and auditor general's office for further guidance.
  
- 3. The projected "crossover" date (date of asset depletion) if any**

TRS has initially determined the crossover date of June 30, 2060.
  
- 4. The bond index that will be used to develop the interest rate for the period after the crossover date**

Buck selected 4% for this illustration based on page 4 of the Municipal Bond Monthly for the latest 20 year AA bond.

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- 5. The projected blended interest rate used for developing Net Pension Liability (NPL)**  
TRS has determined the current estimated interest rate at 6.94% instead of 8.0% as a result of the projected asset depletion by the crossover date.
  
- 6. Expected allocation method of NPL among employers if cost sharing plan**  
TRS plans to use employer's share of active member payroll to allocate cost among employers.
  
- 7. Any unresolved issues concerning the implementation of either GASB 67 or 68**  
TRS continues to work with their advisors to resolve compliance issues as they arise.

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

**Response to recommendations in 2012:**

In the State Actuary's Preliminary Report on the Teachers' Retirement System of Illinois presented December 10, 2012, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in this year's valuation report.

<b>Teachers' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
<b><i>Recommended Changes to Actuarial Assumptions Used in the 2012 Valuation</i></b>		
Cheiron concluded the assumptions were reasonable and had no recommended changes to the assumptions.		
<b><i>Recommended Additional Disclosures for the 2012 Valuation:</i></b>		
1. While we support the recommended total salary increase assumption used in this valuation and conclude that the assumption is reasonable, we recommend that Buck explicitly disclose in their report the merit pay increase assumption by age and active employment status.	Implemented	Addressed on page 38 of the 2013 valuation report.
2. We recommend Buck disclose in their June 30, 2012 report a complete description as to how the New Entrant Profile assumption was developed.	Implemented	Addressed on page 43-44 of the 2013 valuation report.
<b><i>Recommended Changes for Future Valuations:</i></b>		
1. We recommend the Board consider lowering the interest rate assumption below 8% and that the Board annually review the interest rate assumption rather than waiting for the next planned Experience Study.	Not Implemented	Although the Board may have reviewed the interest rate assumption, no change to the rate has been made.  <b>Recommendation repeated and expanded.</b>
2. Before completing the June 30, 2013 valuation next year, we recommend Buck better explain the sources for the unexplained annual liability losses which for the past six valuations have totaled \$2.8 billion. In each of Buck's past six valuation reports, they have reported a line item liability loss which they have described as	Not Implemented	Comments on this loss are not any more detailed than those provided in the 2012 valuation.  <b>Recommendation repeated.</b>

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

<b>Teachers' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
"other causes".		
3. We recommend Buck consider, in future valuations, establishing a corridor around the market value of assets of 80% to 120% beyond which the actuarial value is limited given the use of the actuarial value of in the projection methodology in accordance with the Statute.	Not Implemented	This has not been addressed in the 2013 valuation.  <b>Recommendation repeated.</b>
<b><i>Proposed Certification of the Required State Contribution:</i></b>		
1. We recommend that Buck disclose in the June 30, 2012 valuation an explicit development of the required State contribution for FY 2014, showing all sub-components.	Partially Implemented	There are still missing explicit components of normal cost and expenses – see below.
2. We recommend that Buck disclose in the June 30, 2013 valuation and later valuations the following items in order for us to perform a more comprehensive analysis of the required State contribution in the future: <ul style="list-style-type: none"> <li>• Projections by year of future benefit payouts for actives and current inactive (i.e., retirees, survivors, disabled, and deferred vested).</li> </ul>	Partially Implemented	The 50-year projections in the report contain a column labeled “Benefits and Expenses” on pages 36-37 of the 2013 valuation, but expenses are not broken out. We were provided a separate file of these amounts which should also be included as part of the valuation report disclosure.  <b>Recommendation repeated.</b>
<ul style="list-style-type: none"> <li>• Projections by year of future Gross TRS normal costs and member contributions in dollar amounts by year.</li> </ul>	Partially Implemented	Partially addressed on pages 32-33 of the 2013 valuation, but are not split out into three distinct groups (actives, inactive and terminated vested).  <b>Recommendation repeated.</b>
<ul style="list-style-type: none"> <li>• The present value of future benefits as of the valuation date for actives, terminated</li> </ul>	Not Implemented	Represent important disclosure amounts to comply with ASOPs.

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

<b>Teachers' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
vested, retirees and beneficiaries, and disabled members.		<b>Recommendation repeated.</b>
<ul style="list-style-type: none"> <li>We recommend Buck include historic details on the projections of the maximum contribution calculation without General Obligation Bonds (GOB) in order for us to verify the numbers.</li> </ul>	Partially Implemented	<p>Partially addressed on page 34 of the 2013 valuation. The State Maximum which is based on assets before recognition of the General Obligation Bonds (GOB) is applicable for a fairly long portion of the funding projection. However, there is not development of the Required Employer Costs before offset for the GOB debt service. The report should demonstrate the development of the actuarial value of assets without the GOB as a starting point.</p> <p><b>Recommendation repeated.</b></p>
<ul style="list-style-type: none"> <li>We recommend Buck include the historic development of assets without General Obligation Bonds in future reports.</li> </ul>	Implemented	Addressed on page 34 of the 2013.
<ul style="list-style-type: none"> <li>All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.</li> </ul>	Partially Implemented	<p>Partially addressed in a separate document from the 2013 valuation. Only some of the projections were split into three distinct groups.</p> <p><b>Recommendation repeated.</b></p>



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**Chapter Three**

**PRELIMINARY REPORT ON THE  
STATE UNIVERSITIES  
RETIREMENT SYSTEM**

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In accordance with Public Act 097-0694, 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 December 4, 2013. The preliminary report was based on Cheiron's review of actuarial assumptions included in SURS' 2013 Actuarial Valuation.

Following is Cheiron's final preliminary report on the State Universities Retirement System. SURS' written response, provided on December 17, 2013, can be found in Appendix C.





December 19, 2013

Mr. William G. Holland  
Auditor General  
740 East Ash Street  
Springfield, Illinois 62703

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

Dear Ladies and Gentlemen:

In accordance with Public Act 097-0694 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) for Fiscal Year 2015. This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**In summary, our review of the assumptions and methods used in the June 30, 2013 Actuarial Valuation, which were used to determine the required Fiscal Year 2015 State contribution, found that while most of the assumptions were reasonable individually, we are not comfortable with the continued use of a 7.75% interest rate assumption for reasons explained in this report.** In our 2012 report to the Auditor General and SURS, we recommended the SURS Board consider lowering the interest rate for this 2013 valuation. The Board did not reduce the interest rate assumption. In light of the evidence we present in this report, we now urge the Board to lower the assumption to 7.25% or lower for the upcoming June 30, 2014 Actuarial Valuation. If the Board concludes that this reduction is not needed, we request that SURS provide substantial justification for using a higher interest rate. We also have some other recommended changes for the Board to consider for this 2013 valuation, and other changes for the Board to consider in future valuations. Details on our recommendations can be found in the report that follows. Please provide written responses to our recommendations by close of business on December 16, 2013.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings. 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 2015. Finally, in Section III we comment 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



funding requirements for the System. **In our opinion the statutory mandated minimum funding requirements call for inadequate funding, and do not meet generally accepted actuarial standards of practice.**

In preparing this report, we relied on information (some oral and some written) supplied by the State Universities Retirement System of Illinois (SURS) and GRS. This information includes actuarial assumptions and methods adopted by the SURS Board, plan provisions, summarized census data, the draft 2013 Actuarial Valuation Report, the 2010 formal Experience Study, 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 contained in the body of our report.

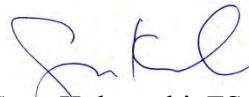
To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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 State Universities Retirement System of Illinois and the Office of the Auditor General for the purpose described herein. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,  
Cheiron



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



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

**THE STATE ACTUARY'S PRELIMINARY REPORT ON THE  
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**SECTION I - REPORT SCOPE**

Under Illinois Public Act 097-0694 (the Act) Cheiron, as the State Actuary, is required to review the actuarial assumptions and valuation of the State Universities Retirement System of Illinois (SURS) and issue this preliminary report to the SURS Board, on the proposed certification prepared by Gabriel Roeder Smith & Company (GRS) of the required State contributions for Fiscal Year (FY) 2015. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the SURS Board to consider before GRS, the SURS actuary, finalizes their certification of the required State contributions to the SURS for FY 2015. In accordance with the Act, our review did not include a replication of the actuarial valuation results.

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, 2013 actuarial valuation prepared by GRS, as well as GRS's Experience Study which included experience investigation of the demographic and economic experience for the SURS for the period July 1, 2005 through June 30, 2010. In addition, we reviewed various presentations and formal studies prepared by GRS, the investment advisor Callan Associates, and SURS staff. The materials we reviewed are listed in Appendix B.

Finally, 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, consistent with our initial report, we continue to interpret actuarial practices to mean: (1) does the Board utilize a qualified actuary to prepare the annual actuarial valuation for determining the required State contribution; and (2) does the Board require the actuary to conduct 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, 2013 actuarial valuation. Future reports may examine additional actuarial practices of the Board.

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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, 2013 Actuarial Valuation Report of SURS. Section III of this report provides detailed analysis and rationale for these recommendations.

**Assessment of Actuarial Assumptions Used in the 2013 Valuation:**

- 1) Public Act 097-0694 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 State Universities Retirement Systems' draft 2013 Actuarial Valuation Report and conclude that while most of the assumptions are reasonable in general, based on the evidence provided to us, we are not comfortable with the continued use of a 7.75% interest rate assumption. In the 2012 report to the Auditor General and SURS, we recommended that the SURS Board consider lowering the interest rate for this 2013 valuation. We now urge the Board to lower the assumption to 7.25% or lower for the upcoming June 30, 2014 actuarial valuation. If the Board concludes that this reduction is not needed, we request that SURS provide substantial justification for using a higher interest rate.

**Recommended Additional Disclosures for the 2013 Valuation:**

- 2) For at least six consecutive years, there have been recurring losses for benefit recipients and termination. We believe that additional analysis and more thorough disclosure is required which would help determine the source of these losses. This same recommendation was made last year, but no evidence of additional analysis is included in the draft June 30, 2013 Actuarial Valuation Report. We strongly recommend the source for this loss be explained and, if possible, prefunded through an appropriate assumption.
- 3) We recommend an explanation of the rationale to lower the Effective Rate of Interest be included in the June 30, 2013 Actuarial Valuation Report.

**Recommended Changes for Future Valuations:**

- 4) We concur with GRS's recommendation, and recommend again, as we did last year, to establish a corridor around the market value of assets of 80% to 120% beyond which the actuarial value is limited given the use of the actuarial value of assets in the projection methodology in accordance with Public Act 96-0043. While this change would have no impact on the System for the June 30, 2013 valuation, we believe it would be better to establish this corridor before it is actually applicable.
- 5) We recommend the Board annually review the economic assumptions (interest rate and inflation) each year prior to commencing the valuation work and adjust assumptions accordingly.

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**SECTION II - SUMMARY OF RECOMMENDATIONS**

- 6) We recommend that GRS consider using a fully generational mortality table so that future mortality improvements will continue to impact new entrants throughout the projection period ending in 2045.
- 7) We have one minor recommendation to future reports. We recommend the description of Annual Compensation Increases be changed in the Actuarial Valuation Report. The current description on page 36 of the draft June 30, 2013 Actuarial Valuation Report states that the base 3.75% "rate is increased for members with less than 9 years of service." The table on the same page indicates the base rate is increased for members with less than 34 years of service.

**Proposed Certification of the Required State Contribution:**

- 8) GRS has determined that the FY 2015 required State contribution calculated under the current statutory funding plan is \$1,544,200,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and reviewed the assumptions on which it is based. In verifying these calculations, we have accepted GRS' annual projections of future payroll, total normal costs, benefits, expenses, and total contributions. We recommend that GRS continue to disclose in future valuations the above items in order for us to continue to perform an analysis of the required State contribution. In addition, we would also request again, as we did last year, that GRS include the historic development of assets without the General Obligation Bonds (GOB). We also request GRS include a more detailed explanation of the selection of the current new entrant profile.

**State Mandated Funding Method:**

- 9) The current statutory funding plan calculates the minimum contribution to SURS for each fiscal year as the amount sufficient to cause the total assets of the System to equal 90% of the total liabilities of the System by the end of Fiscal Year 2045. **This funding method does not meet actuarial standards of practice because the system is not targeted to be funded at 100% and the funding of the plan is pushed back to later years. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of SURS.** Based on the draft 2013 Actuarial Valuation Report, the funded ratio is only 41.5% based on the actuarial value of assets as a ratio over the actuarial liability. We have concerns about the solvency of the System if there is a significant market downturn. **We concur with GRS's comments on the implication on the System of the State Mandated Funding method, and suggest, due to the systematic underfunding of the System, that the SURS Board always use the conservative end of any range of assumptions recommended by GRS. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.**

### SECTION III - SUPPORTING ANALYSIS

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

#### **A. Economic Assumptions**

##### *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 changed to 7.75% from 8.50% for the June 30, 2010 actuarial valuation.

**After reviewing all the materials (see Appendix B of the report) that were made available, Cheiron recommends the SURS Board lower the interest rate assumption from 7.75% to 7.25% or lower for the upcoming June 30, 2014 valuation. If the Board concludes this rate reduction is not needed, we request that SURS provide substantial justification for using a higher interest rate, in light of the evidence we present below (Recommendation #1).**

*Our rationale for this recommendation is as follows:*

- The Review of Asset Allocation 2013 Capital Market Assumptions by Callan Associates (Callan 2013 Review) shows an expected geometric return on the System's portfolio to be 6.95% over a 5- to 10-year time horizon. This expected return has declined 55 basis points since the report from 2011.
- In GRS's 2010 Experience Study, they relied on the opinion of nine independent investment consultants who provided that *the probability of exceeding 7.75%* investment return each year is 44.59% (page 9 of the experience report). Therefore, it can be inferred that at this assumption there is a higher likelihood of investment loss than gain and the expected average return rate based on the current asset allocation is lower than 7.75%.
- GRS adhered to Actuarial Standards of Practice (ASOP No. 27) in developing the interest rate assumption by application of the building block approach based on underlying capital market assumptions provided by nine independent investment consultants in the 2010 Experience Study (see pages 9 through 11). However, based on updated capital market assumptions shown in the Callan 2013 Review, a revised building block approach would indicate a rate of less than 7.75%. A new standard has been developed, effective September 2014. The language in the new standard, which has been known for the last two years, requires that the assumption "has no significant bias (i.e. it is not significantly optimistic or pessimistic)." In our opinion, applying an assumption that has a 44.6% chance of being achieved is significantly optimistic.
- GRS, in their draft June 30, 2013 valuation, is reporting a funded ratio (actuarial value of assets over actuarial liabilities) of 41.5% which indicates the plan will require significant

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future funding. Even though a more realistic assumption would drop that ratio below 40%, it would also require expedited funding of the System going forward.

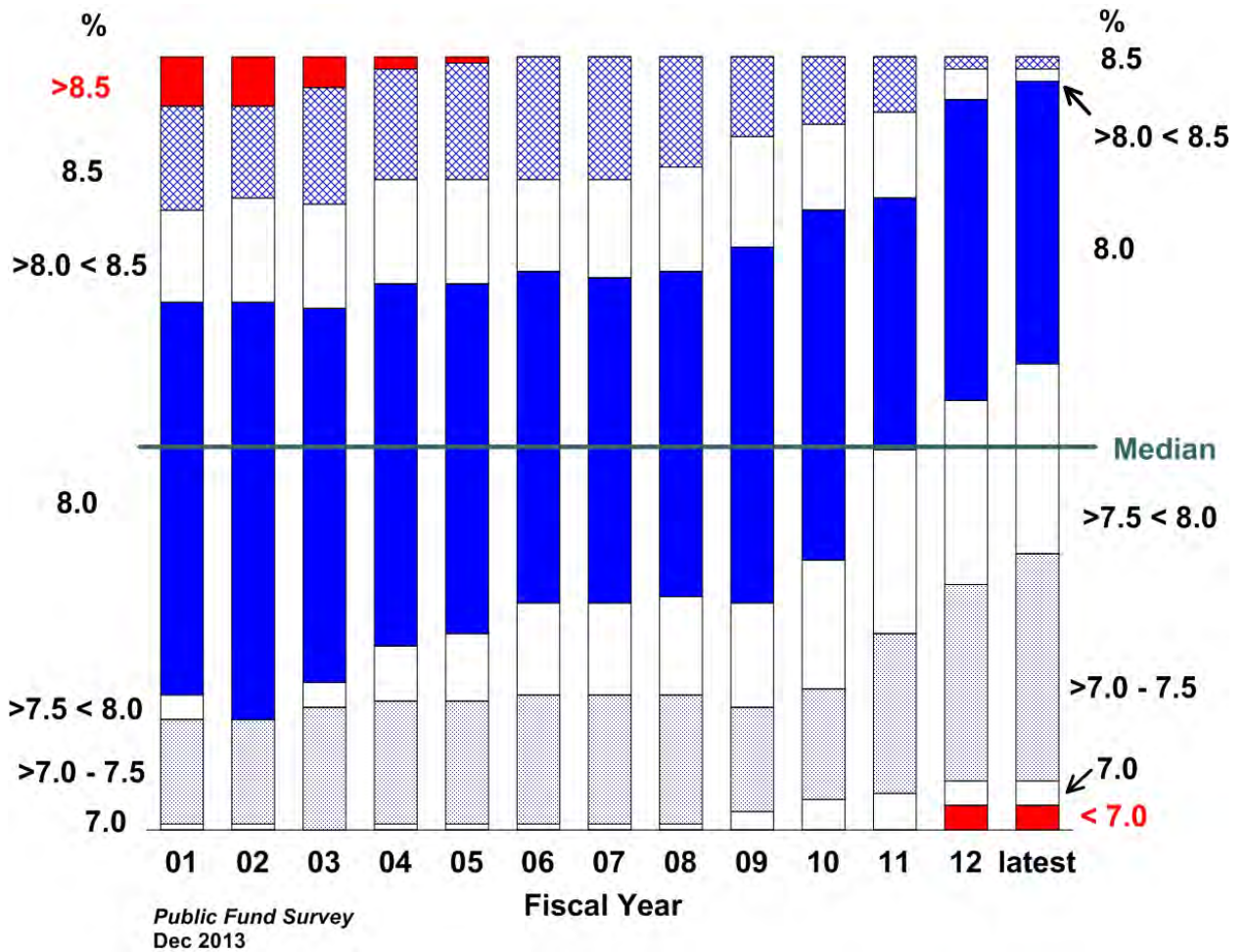
**We continue to recommend, as we did last year, that the Board annually review the interest rate assumption, and this year further recommend that the inflation rate assumption also be part of the annual review. This is as opposed to the current process of waiting for the completion of a formal Experience Review study (Recommendation #5).**

*Our rationale for this recommendation is as follows:*

- A review of the interest and inflation rates does not involve the collection of significant data, and can easily be updated annually. In addition, it keeps the Board focused more closely on these very important assumptions.
- The National Association of State Retirement Administrators (NASRA) conducts an annual survey of public funds. The latest Public Fund Survey covers 126 large retirement plans. The following chart shows the distribution of investment return assumptions for the last 12 years of their survey. The latest data includes results collected through December 2013.

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Over the period shown in the latest survey, there continues to be a pattern of reducing investment return assumptions. 42 of the 126 plans have reduced the interest rate assumption since Fiscal Year 2011. Of the nine plans in the survey that indicate an interest rate reduction since Fiscal Year 2012 the median, reduction is 0.43%. The survey is consistent with experience of other Cheiron clients, with which there has been a significant trend to reduce the investment return assumptions in the last three years.

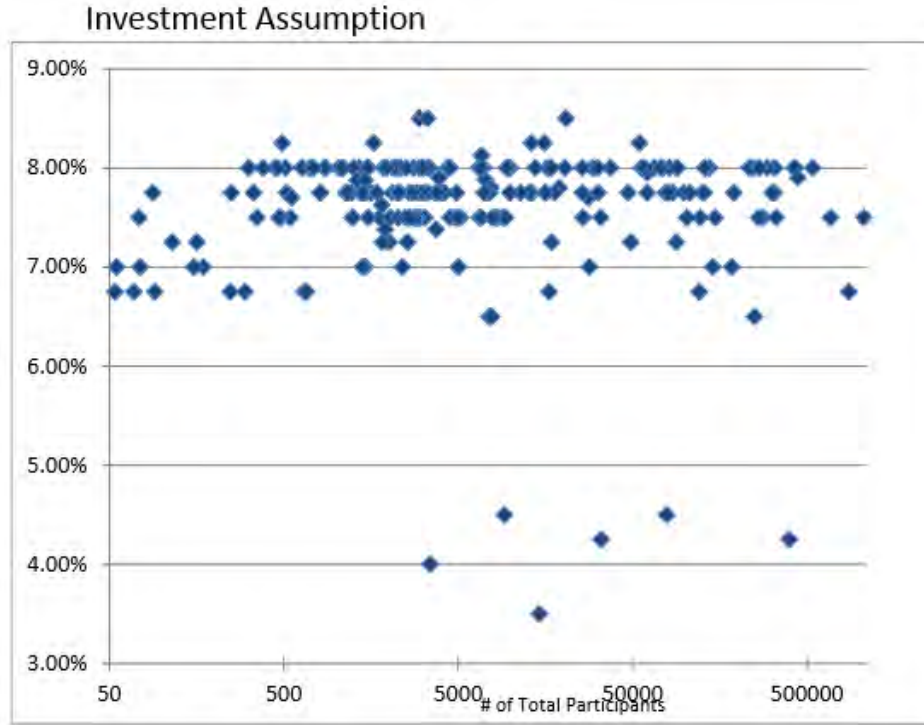
- The Statutory funding requirement cannot be ignored in the choice of an appropriate interest assumption. Fundamental to the Statute is the requirement to determine the appropriate portion of unfunded liability to be funded each year that produces a level amortization amount as a percent of future projected payroll. If the interest assumption is expected to result in a higher likelihood of returns below the rate than above, then by definition, this will produce future losses and an increasing amortization amount as a percent of payroll.



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- The following chart from page 11 of the October 2013 *National Conference on Public Employees Retirement Systems (NCPERS) Public Fund Study* shows the rates used nationwide by public sector pension plans.



As part of the study, NCPERS identified that the average investment assumption for the 241 state and local pension plan respondents was 7.6%, a decrease from last year's value of 7.7% and estimating that 40% have reduced this assumption compared to the 2012 study.

- *Pension Industry (actuarial, accounting, legal, and investment professional organizations) pressures may lead to mandated lower interest rates:* In recent years, there has been increased and controversial movement in the actuarial community that actuaries must move away from this traditional theory where the assumed interest assumption is based on expected plan earnings, and instead employ theories espoused by financial economists. Under financial economic theory, the interest rate used to value pension plan liabilities should be based on near risk free rates of returns, because pension liabilities (or benefit payments) are considered more akin to bonds, and that using the higher expected earnings rates hides the risks of achieving that return. Near risk free rates of returns today would be less than 4% and would enormously increase the liabilities of the SURS, and the resulting required State contribution. While this debate continues and has not been resolved, there are external signs that the public sector may ultimately be forced to utilize much lower investment assumptions.

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- New GASB 67 and 68 pronouncements may subject many public pension plans, such as SURS, to effectively use a lower interest rate for accounting disclosures and pension expense determinations in fiscal years 2014 and 2015, respectively. It is important to note, however, that the new standards do not define funding requirements for a plan.
- Moody's, an organization that provides bond rating information for private investors, has recently announced that they propose to compare the financial viability of public sector pension plans by using, among other things, a 5.67% interest rate assumption.
- The federal government, which promulgates minimum funding standards for corporate pension plans, already requires corporate pension plans to utilize interest assumptions based on short-term and mid-term bond rates, which are very low.

2. *Inflation Assumption:*

**The inflation assumption of 2.75%, which primarily impacts the salary increase assumption, used in the 2013 actuarial valuation by GRS in certifying the required State contribution is reasonable.**

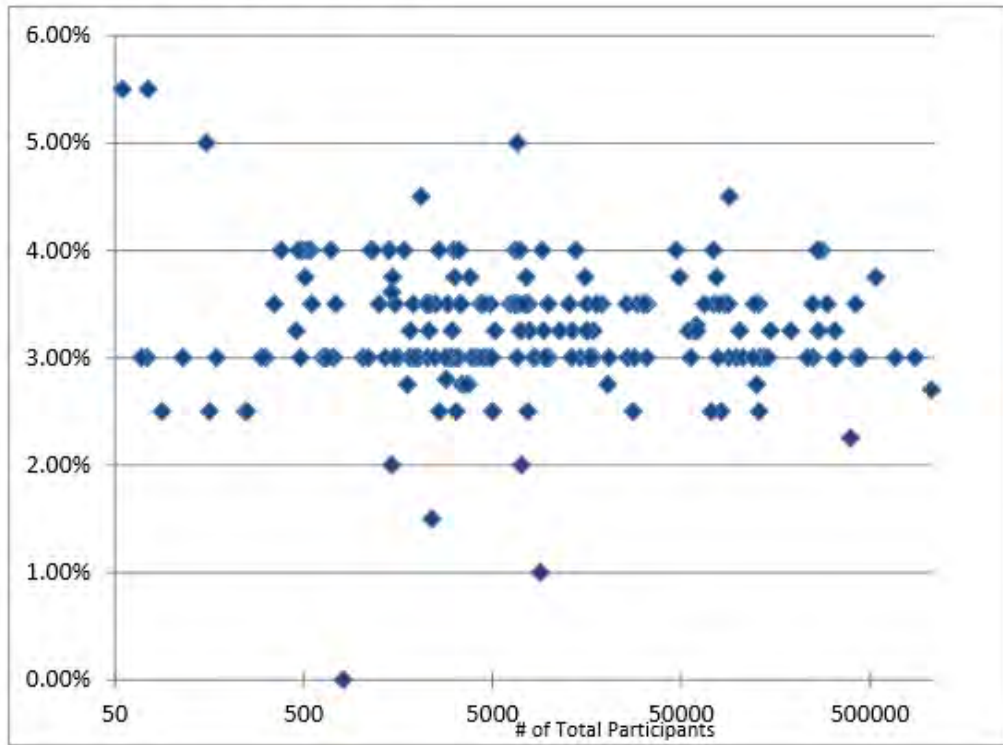
*Our rationale for concurring with the 2.75% assumption:*

- The 2013 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years) inflation will average somewhere between 1.8% and 3.8%.
- As shown on pages 6 and 7 of the GRS 2010 Experience Study, there continues to be support for this assumption as a long-term rate even though the historic short-term averages are being lowered by the current historically low rates.
- Our comparison of other public sector retirement systems' inflation assumption, as shown by surveys published by Boston College's Center of Public Research (CPR), shows that most public sector pension plans utilize an inflation assumption in the range of 2.75% to 3.75%.
- *A National Conference on Public Employers Retirement Systems (NCPERS) 2013 study, provides the following graphic of respondents inflation assumption:*

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Inflation Assumption



This shows that the 2.75% assumption, which SURS uses, is on the lower end of the inflation assumptions used amongst the 241 systems who responded to this study, with 3.3% as the average.

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3. *Salary (Annual Compensation) Increase Assumption:*

For the draft June 30, 2013 actuarial valuation, the salary scale assumption, which remains the same as it was in 2012, is shown in the table below.

**Salary Increase**

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

<b>Service Year</b>	<b>Annual Increase</b>
0	12.00%
1	10.00%
2	8.50%
3	7.25%
4	6.50%
5	6.25%
6	6.00%
7	5.75%
8	5.50%
9-13	5.00%
14-19	4.75%
19-33	4.25%
34+	3.75%

These increases include a component for inflation of 2.75% per annum and 1.00% standard of living increase.

**We recommend the description of Annual Compensation Increases be changed in the actuarial valuation report to reflect the table above. The current description on page 36 of the actuarial valuation states that the base 3.75% “rate is increased for members with less than 9 years of service.” The table indicates the base rate is increased for members with less than 34 years of service (Recommendation #7).**

This assumption was arrived at following the 2010 GRS Experience Study and first implemented in the 2011 valuation.

**We find the assumption and the basis for setting it as reasonable.**

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

- This assumption, which is employer specific, is supported by credible data as shown on pages 11-14 of the 2010 Experience Study performed by GRS.

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- During the year ending June 30, 2013 there was a small experience gain from this assumption (i.e. salary increases were less than assumed) as shown on page 17 of the draft June 30, 2013 GRS Actuarial Valuation Report. The table on page 17 shows there has been gains due to salary increases for the last four years. However, this alone should not be a consideration for changing this assumption long term, and is more indicative of the state of the current economy.
- In our own experience with our public sector pension plans (about 60 large plans), we have witnessed a consistent recent trend of declining salary increases for public sector employees which was addressed when the assumption was changed effective for the June 30, 2011 valuation.

4. *Cost of Living Adjustment Assumption:*

Benefits are increased annually as described on page 36 of the 2013 valuation. Annual increases are 3% for those hired prior to January 1, 2011 and based upon ½ of the Consumer Price Index for those hired on or after January 1, 2011, which is 1.375% based on the inflation assumption of 2.75%.

**We find the assumption and the basis for setting it as reasonable.**

5. *Capped Pay Assumption:*

Benefits for members hired after January 1, 2011 are calculated using pay that is capped under Public Act 96-0889. The pay cap is shown on page 44 of the June 30, 2013 valuation to be \$109,971 for 2013 and \$108,883 for 2012.

**We find the assumption and the basis for setting it as reasonable.**

6. *Effective Rate of Interest:*

The Effective Rate of Interest is the interest rate that is applied to member contribution balances. For purposes other than determining the money purchase benefit this rate is determined by the Board annually. Member accounts are assumed to be credited with an effective rate of interest of 7.00% for the June 30, 2013 valuation. This rate was lowered from the 7.75% used in prior valuations, but an explanation of the rationale that indicated this change was not included in the Actuarial Valuation Report. The change in this assumption created a gain of \$157 million for the June 30, 2013 valuation.

**We recommend an explanation of the rationale to lower this rate be included in the June 30, 2013 Actuarial Valuation Report. (Recommendation #3)**

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**B. Demographic Assumptions**

For the June 30, 2013 Actuarial Valuation, GRS has maintained the same assumption changes used in the prior valuation and first adopted in the June 30, 2011 actuarial valuation. This includes modifications recommended in the 2010 Experience Study.

Out of the demographic assumptions, there are two assumptions that should be more closely reviewed.

*1. Recurring Loss for Benefit Recipients:*

Benefit Recipients have shown consistent losses over the past several years (page 17 of the draft June 30, 2013 valuation report). One source contributing to this loss described in the valuation is the difference between expected and actual benefits calculated for benefit recipients. For the June 30, 2011 valuation, a 10% load was added to the liability of retirees who are receiving benefits based on preliminary estimates. However, for the 2013 valuation, there was still a significant loss (\$31.2 million) for these participants.

**We strongly recommend the source for this loss be explained and, if possible, prefunded through an appropriate assumption (Recommendation #2).**

*2. Mortality:*

*Post-Retirement Mortality*

RP2000 Combined Healthy mortality table, sex distinct, with rates projected to 2017 with scale AA, with rates multiplied by 0.80 for males and 0.85 for females. No adjustment is made for post-disabled mortality. The mortality table used is a static table with the provision for future mortality improvement in the projection to 2017.

*Pre-Retirement Mortality*

Based on a percentage of 85% for males and 60% for females of post-retirement mortality.

Age	Sample Mortality Rates		Preretirement	
	Postretirement Males	Postretirement Females	Preretirement Males	Preretirement Females
35	0.0568%	0.0335%	0.0483%	0.0201%
40	0.0753%	0.0464%	0.0640%	0.0278%
45	0.0966%	0.0726%	0.0821%	0.0436%
50	0.1256%	0.1064%	0.1068%	0.0639%
55	0.2093%	0.2015%	0.1779%	0.1209%
60	0.4103%	0.3946%	0.3488%	0.2367%
65	0.8018%	0.7576%	0.6815%	0.4546%
70	1.3740%	1.3068%	1.1679%	0.7841 %
75	1.3817%	2.0841%	2.0244%	1.2505%

Recently changed Actuarial Standards of Practice (ASOP No. 35) now requires that actuaries at least consider projections of mortality improvements, and if there is not such an

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assumption for improvement, the actuary must disclose the basis for not making the assumption. GRS has stated that the most recent Experience Study indicates that the current mortality assumption has an estimated margin of 10% for future mortality improvements. **We recommend using a fully generational mortality table for future valuations. A fully generational mortality table has mortality improvements automatically built-in for new members entering the System, which is important given that open group projections through 2045 provide the basis for the calculated contribution rates (Recommendation #6).**

**Below we summarize all remaining demographic assumptions which we reviewed and we have concluded all are reasonable and meet the requirements of ASOP No. 35, section 3.3.4.**

**1. Marriage Assumption**

<b>Age</b>	<b>Males</b>	<b>Females</b>
20	25%	40%
30	70	75
40	80	80
50	85	80
60	85	70

**2. Self Managed Plan Election**

15% of total future hires will elect to participate in the Self-Managed Plan.

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**3. Termination**

Illustrative rates of withdrawal from the System are as follows:

<b>Years of Service</b>	<b>All Members</b>
0	22.0%
1	22.0
2	16.0
3	14.0
4	12.0
5	10.5
6	9.0
7	7.5
8	6.5
9	6.0
10	5.5
11	4.5
12	4.0
13	3.7
14	3.2
15	3.0
16	2.6
17	2.3
18	2.1
19	2.0
20	1.7
21	1.5
22	1.5
23	1.5
24	1.5
25	1.5
26	1.5
27	1.5
28	1.5
29	1.5

Part-time members with less than three years of service (all members classified as part time for valuation purposes) are assumed to terminate at the valuation date.

Members that terminate with at least five years of service are assumed to elect the most valuable option on a present value basis – refund of contributions or a deferred benefit.



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**4. Retirement**

Upon eligibility, active members are assumed to retire as follows:

Age	<u>Members Hired before January 1, 2011 and Eligible for</u>		<u>Members Hired on or after January 1, 2011 and Eligible for</u>	
	Normal Retirement	Early Retirement	Normal Retirement	Early Retirement
Under 50	40.0%	-	-	-
50	38.0	-	-	-
51	38.0	-	-	-
52	38.0	-	-	-
53	38.0	-	-	-
54	34.0	-	-	-
55	32.0	7.0%	-	-
56	26.0	5.0	-	-
57	26.0	4.5	-	-
58	26.0	5.5	-	-
59	26.0	6.0	-	-
60	11.0	-	-	-
61	11.0	-	-	-
62	13.0	-	-	35.0%
63	13.0	-	-	15.0
64	13.0	-	-	15.0
65	17.0	-	-	15.0
66	15.0	-	-	15.0
67	15.0	-	50.0%	-
68	15.0	-	35.0	-
69	15.0	-	30.0	-
70-79	30.0	-	30.0	-
80+	100.0	-	100.0	-

Members that retire are assumed to elect the most valuable option on a present value basis – refund of contributions (or portable lump sum retirement, if applicable) or a retirement annuity.

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**5. Disability**

A table of disability incidence with sample rates follows:

<b>Age</b>	<b>Males/ Females</b>	<b>Age</b>	<b>Males/ Females</b>	<b>Age</b>	<b>Males/ Females</b>
20	0.05%	40	0.15%	60	0.42%
21	0.05%	41	0.16%	61	0.44%
22	0.06%	42	0.17%	62	0.45%
23	0.06%	43	0.18%	63	0.47%
24	0.06%	44	0.19%	64	0.48%
25	0.06%	45	0.20%	65	0.50%
26	0.07%	46	0.21%	66	0.51%
27	0.07%	47	0.23%	67	0.53%
28	0.07%	48	0.24%	68	0.54%
29	0.07%	49	0.26%	69	0.56%
30	0.08%	50	0.27%	70	0.57%
31	0.08%	51	0.29%	71	0.57%
32	0.08%	52	0.30%	72	0.57%
33	0.08%	53	0.32%	73	0.57%
34	0.09%	54	0.33%	74	0.57%
35	0.10%	55	0.35%	75	0.57%
36	0.11%	56	0.36%	76	0.57%
37	0.12%	57	0.38%	77	0.57%
38	0.13%	58	0.39%	78	0.57%
39	0.14%	59	0.41%	79	0.57%

Disability rates apply during the retirement eligibility period.

**6. 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.

**7. Spouse's Age**

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

**8. 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 30 years old at the valuation. 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. 70% of current total male retirees and 80% of current total female retirees in the traditional plan that have not elected a survivor refund are assumed to have a spouse at the valuation date.

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**9. 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 if at least 30 years of service.

**10. Load on Final Average Salary**

No load is assumed to account for higher than assumed pay increases in final years of employment before retirement.

**11. 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.

**12. Valuation of Inactives**

An annuity benefit is estimated based on information provided by staff for inactive members with five or more years of service.

**13. Reciprocal Service**

Reciprocal service is included for current inactive members for purposes of determining vesting eligibility and eligibility age to commence benefits. The recently updated actuarial assumptions (including retirement and termination rates) were based on SURS service only.

Therefore, reciprocal service was not included for current active members. Reciprocal service will be collected and analyzed in the future and will be considered in the next Experience Study.

**14. Other Projection Assumptions**

The number of total active members will remain the same as the total number of active members in the current valuation throughout the projection period.

New entrants have an average age of 37.2 and average pay of \$36,040 (2013 dollars). These values are based on the average age and average pay of current members. The range profile is based on the age at hire and assumed pay at hire (using the actuarial assumptions, inflated to 2013 dollars) of current active members with service between one and four years. We recommend that GRS give more details on how the new entrant profile has been developed. Specifically, we recommend GRS include if the profile applies to all new entrants or if new entrants have a variety of profiles with the given averages and if so the details of each group such as age and salary distributions, and gender (Recommendation #8)

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**15. SMP Contribution Assumptions**

The projected SMP contributions are equal to 7.6% of SMP payroll, plus estimated SMP expenses minus SMP employer forfeitures. Estimated SMP expenses for FY 2014 are \$435,016 and SMP employer forfeitures used to reduce the certified contributions for FY 2015 are \$3,445,277. Estimated SMP expenses for FY 2015 and after are assumed to increase by 2.75%. Estimated SMP employer forfeitures used to reduce the certified contributions for FY 2016 and after are assumed to be 7.5% of the gross SMP employer contribution.

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#### C. 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). Since the amortization basis is governed by State law, we do not comment on it here.

##### *1. Cost Method:*

The System uses the projected unit credit cost method (PUC) to assign costs to years of service, as required to under 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) funding method as it is more consistent with the Public Act 94-0004's requirement 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 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 Entry Age Normal (EAN) funding method to mitigate this affect. It should also be noted that the EAN method will be the required method to calculate liability for GASB 67 & GASB 68.

##### *2. Asset Smoothing 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 that the fluctuations in the actuarial value of assets will be less volatile over time than fluctuations in the market value of assets. **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 actuarial cost, and we concur with its use.**

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 asset 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 (IRS) mandates this "corridor" for private sector pension plans (a 90%-110% corridor is mandated). Even though it is not mandated for public plans, we believe that the use of this type of corridor is a much sounder actuarial practice, and according to ASOP No. 44 in

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Section 3.3 b 1, the actuarial value of assets should "...fall within a reasonable range around the corresponding market value". **Therefore, we concur with GRS's recommendation that the SURS Board consider moving to this approach in future valuations (Recommendation #4).** It's important to note that currently a move to this corridor approach would have no impact on the 2013 actuarial valuation results, as the actuarial value of assets is already within the 80%-120% corridor.

#### **D. Determination of the Required State Contribution**

As required by Public Act 94-0004, in determining the required State contribution under state law, the actuary must determine what level of future contributions is needed to make a projection of the Plan's funded status in 2045 to be at 90%. To make that determination, the actuary needs to make an assumption regarding the age/sex/salaries of new hires that replace existing members leaving over this period. This assumption is commonly referred to as the "New Entrant Profile". In addition to making that assumption, the actuary needs to apply actuarial methodologies to project the June 30, 2013 valuation into the future.

The "New Entrant Profile" assumption is a critical assumption as the required projection of 90% funding in the year 2045 means that the majority of active members will be new hires after the current June 30, 2013 valuation. The new entrant profile is shown on page 42 of the June 30, 2013 report. It is based on the profile of current active participants with service between one and four years. Including participants with more than two years of service may be biasing the age and salary characteristics of new hires. **Therefore, we recommend that GRS include a more detailed explanation of the selection of the current new entrant profile (Recommendation #8).**

**We also recommend that GRS continue to disclose in future valuations items needed to perform an analysis of GRS's determination of the System's funded status in 2045 (Recommendation #8).** Details of the information included in the projections are required to allow us to perform a comprehensive analysis of GRS's determination of the required State contribution. GRS provided details requested within section E of the valuation report.

#### **E. Other Issues**

##### *1. State Mandated Funding Method:*

In the Summary of the draft 2013 Actuarial Valuation Report, GRS clearly states their criticism that the required State contribution to the SURS, defined by Illinois Pension Code (40 ILCS 5/15-155), is currently underfunding the system. This law requires that the actuary base the required contribution using a prescribed funding method that achieves a 90% funding in the year 2045. GRS comments that the current funding policy defers funding which puts the system at risk that benefit obligations will not be met. They recommend a funding policy based on 100% funding within thirty years in accordance with GASB 25, as well as generally accepted actuarial practices. **We concur with GRS's comments on the**

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**implication on the System of the State Mandated Funding method, and suggest due to the systematic underfunding of the System, that the SURS Board always use the conservative end of any range of assumptions recommended by GRS. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn. (Recommendation #9).**

*2. State Mandated Projection Method:*

Under Public Act 96-0043, the actuarial methodologies utilized in performing the 2045 projection of the System's funded status assume the future earnings rate (currently at 7.75%) is applied to the actuarial value of assets (AVA) rather than the market value of assets (MVA).

The table below demonstrates what the market value would have to earn for the actuarial value to earn 7.75% based on the ratio of actuarial value to market value. We recommend that consideration be given to require that the projected future earnings of the System be based on starting market values of assets (rather than a smoothed value).

**What the market value of assets (MVA) would need to earn in a given year, if the actuarial value of assets (AVA) are assumed to earn 7.75%, at various ratios of**

<u>Ratio of AVA to MVA</u>	<u>Required MVA Return</u>
130.00%	79.37%
125.00%	67.44%
120.00%	55.50%
115.00%	43.56%
110.00%	31.63%
105.00%	19.69%
100.00%	7.75%
95.00%	-4.19%
90.00%	-16.13%
85.00%	-28.06%
80.00%	-40.00%
75.00%	-51.94%
70.00%	-63.88%

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**F. Preparations for GASB 67 & 68**

The Governmental Accounting Standards Board (GASB) adopted Statement No. 67 (GASB 67) **Financial Reporting for Pension Plans—an amendment of GASB Statement No. 25** and Statement No. 68 (GASB 68) **Accounting and Financial Reporting for Pensions—an amendment of GASB Statement No. 27**. GASB 67 is effective for periods beginning after June 15, 2013 and GASB 68 is effective for fiscal years beginning after June 15, 2014. The following is a brief summary of some of the changes contained in these statements:

- The Total Pension Liability will be calculated using the individual entry age actuarial cost method.
- A new blended discount rate assumption will be based on (1) a long-term expected rate of return on pension plan investments to the extent that assets are projected to be sufficient to pay benefits based on future contributions intended to finance current member benefits (i.e., excluding normal cost contributions for new entrants) and (2) a tax-exempt, high-quality municipal bond rate to the extent that the conditions for use of the long-term expected rate of return are not met. This will likely mean the discount rate will be reduced if projected contributions plus assets are not able to cover projected pension benefits.
- The Unfunded Actuarial Liability, now called Net Pension Liability, will be calculated using the market value of assets instead of the smoothed actuarial value of assets.
- The entire Net Pension Liability will be recognized immediately on the employer's statement of net position.
- The Annual Required Contribution (ARC) has been eliminated. The new Pension Expense which equals: Normal Cost + Interest Cost - Expected Asset Earnings + Amortization of changes in total pension liability +/- five year differences on the actual vs. expected asset returns.
- Recognition periods of unexpected changes in net pension liability would vary depending upon the source for the change. These periods would be immediate for plan changes, five years for the difference between projected and actual investment earnings, and expected working lifetime of both active and inactive members for other total pension liability changes.

We have reviewed the System's strategy for implementing GASB 67 and 68 and summarized below.

**1. The implementation, reporting, measurement and valuation dates for GASB 67 and 68**

- SURS will implement GASB 67 for their Fiscal Year 2014 (July 1, 2013 – June 30, 2014) Comprehensive Annual Financial Report.



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- SURS will implement GASB 68 for our employer's Fiscal Year 2015 (July 1, 2014 – June 30, 2015) financial reporting disclosure.
  - SURS plans to use a valuation date of one year prior to the year-end financial statements of June 30, 2014.
  - The measurement date is required to be the Fiscal Year for GASB 67.
- 2. The method that will be used to develop the Actuarially Determined Employer Contribution**  
SURS will use the EAN cost method to calculate liabilities with a blended interest discount rate and an amortization period based on the average future working lifetime of 19.11 years.
  - 3. The projected "crossover" date (date of asset depletion) if any**  
SURS estimated a 2030 crossover date, but no analysis provided.
  - 4. The bond index that will be used to develop the discount rate for the period after the crossover date**  
SURS has not yet determined the index that will be used. They will work with their external auditor to determine source.
  - 5. The projected blended discount rate used for developing Net Pension Liability (NPL)**  
SURS estimated a rate of 7.6% based on initial analysis GRS did using 6/30/2011 valuation.
  - 6. Expected allocation method of NPL among employers if cost sharing plan**  
SURS expects to allocate based upon the employer's earnings as a percentage of total state appropriation.
  - 7. Any unresolved issues concerning the implementation of either GASB 67 or 68**  
None reported at this time.

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

**Response to recommendations in 2012:**

In the State Actuary's Preliminary Report on the State Universities Retirement System of Illinois presented December 10, 2012, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in this year's valuation report.

<b>State Universities Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
<b><i>Recommended Changes to Actuarial Assumptions Used in the 2012 Valuation</i></b>		
Cheiron concluded the assumptions were reasonable and had no recommended changes to the assumptions.		
<b><i>Recommended Additional Disclosures for the 2012 Valuation:</i></b>		
1. We recommend GRS revise its June 30, 2012 valuation to include projections of the maximum contribution calculation without General Obligation Bonds (GOB).	Implemented	Provided for 2012 in supplemental material in December 2012 Addressed on page 31 of the 2013 valuation report.
2. We recommend GRS disclose in their June 30, 2012 report a complete description as to how the New Entrant Profile assumption was developed.	Implemented	Provided for 2012 in supplemental material in December 2012 Addressed on page 42 of the 2013 valuation report. <b>Recommend more detail in future reports.</b>
<b><i>Recommended Changes for Future Valuations:</i></b>		
1. We concur with GRS's recommendation to establish a corridor around the market value of assets beyond which the actuarial value is limited given the use of the actuarial asset value in the projection methodology in accordance with statute.	Not Implemented	<b>Recommendation repeated.</b>
2. We recommend GRS include a complete disability incidence table in future reports	Implemented	Addressed on page 38 of the 2013 valuation report.
3. We recommend a continued examination of the recurring loss for benefit recipients and adjustment to assumptions if the loss persists.	Not Implemented	This has not been addressed in the 2013 valuation. <b>Recommendation repeated and expanded.</b>
4. We recommend the Board annually review the interest rate assumption.	Not Implemented	Although the Board may have reviewed the interest rate assumption, no change to the rate has been made. <b>Recommendation repeated and expanded.</b>

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

<b>State Universities Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
5. We recommend that GRS demonstrate the development of the capped pay calculated in the report.	Implemented	Addressed on page 44 of the 2013 valuation report.
<b><i>Proposed Certification of the Required State Contribution:</i></b>		
1. We recommend that GRS disclose in the June 30, 2013 valuation and later valuations the following items in order for us to perform a more comprehensive analysis of the required State contribution in the future: <ul style="list-style-type: none"> <li>• Projections by year of future benefit payouts for actives and current inactive (i.e. retirees, survivors, disabled, and deferred vested).</li> </ul>	Implemented	Addressed in section E of 2013 valuation report
<ul style="list-style-type: none"> <li>• Projections by year of future SURS normal costs and member contributions.</li> </ul>	Implemented	Addressed in section E of 2013 valuation report
<ul style="list-style-type: none"> <li>• The present value of future benefits for actives, terminated vested, retirees and beneficiaries, and disabled members.</li> </ul>	Implemented	Addressed in section E of 2013 valuation report
<ul style="list-style-type: none"> <li>• For each of these items the impact of the Self-Managed Plan (SMP) needs to be clearly delineated.</li> </ul>	Implemented	Addressed in section E of 2013 valuation report
<ul style="list-style-type: none"> <li>• We recommend GRS include the historic development of assets without General Obligation Bonds (GOB) in future reports.</li> </ul>	Partially Implemented	Partially addressed on page 30 of the 2013 valuation. The report demonstrated the development of the actuarial value of assets without the GOB for a single year, but we again request historic development of assets back to the issuance of the GOB. <b>Recommendation repeated.</b>
<ul style="list-style-type: none"> <li>• All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.</li> </ul>	Implemented	Addressed in section E of 2013 valuation report



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**Chapter Four****PRELIMINARY REPORT ON THE  
STATE EMPLOYEES'  
RETIREMENT SYSTEM**

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In accordance with Public Act 097-0694, 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 December 4, 2013. The preliminary report was based on Cheiron's review of actuarial assumptions included in SERS' 2013 Actuarial Valuation.

Following is Cheiron's final preliminary report on the State Employees' Retirement System. SERS' written response, provided on December 16, 2013, can be found in Appendix C.



December 19, 2013

Mr. William G. Holland  
Auditor General  
740 East Ash Street  
Springfield, Illinois 62703

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

Dear Ladies and Gentlemen:

In accordance with Public Act 097-0694 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) for Fiscal Year 2015. This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices, which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**In summary, our review of the assumptions and methods used in the June 30, 2013 Actuarial Valuation, which were used to determine the required Fiscal Year 2015 State contribution, found that while most of the assumptions were reasonable individually, we are not comfortable with the continued use of a 7.75% interest rate assumption for reasons explained in this report.** In our 2012 report to the Auditor General and SERS, we recommended that the SERS Board consider lowering the interest rate for this 2013 valuation. While the Board considered lowering the rate, it decided not to. In light of the evidence we present in this report, we now urge the Board to lower the assumption to 7.25% or lower for the upcoming June 30, 2014 Actuarial Valuation. If the Board concludes that this reduction is not needed, we request that SERS provide substantial justification for using a higher interest rate. We also have some other recommended changes for the Board to consider in future valuations. Details on our recommendations can be found in the report that follows. Please provide written responses to our recommendations by close of business on December 16, 2013.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings. 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 2015. Finally, in Section III we comment on other issues impacting the funding of the State Employees' Retirement System, including the



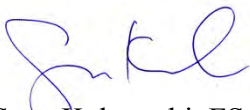
implications of Article 14 of the Illinois Pension Code, which establishes the statutory funding requirements for the System. **In our opinion the statutory mandated minimum funding requirements call for inadequate funding, and do not meet generally accepted actuarial standards of practice.**

In preparing this report, we relied on information (some oral and some written) supplied by the State Employees' Retirement System of Illinois (SERS) and GRS. This information includes actuarial assumptions and methods adopted by the SERS Board, plan provisions, summarized census data, the draft 2013 Actuarial Valuation Report, 2013 minutes of the 2013 Board of Trustee meetings, and a February 2013 GRS study on the valuation interest rate. A detailed description of all information provided for this review is contained in the body of our report.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,  
Cheiron



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



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



**THE STATE ACTUARY'S PRELIMINARY REPORT ON THE  
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**SECTION I - REPORT SCOPE**

Under Illinois Public Act 097-0694 (the Act) Cheiron, as the State Actuary, is required to review the actuarial assumptions and valuation of the State Employees Retirement System of Illinois (SERS) and issue this preliminary report to the SERS Board on the proposed certification prepared by Gabriel Roeder Smith & Company (GRS) of the required State contributions for Fiscal Year (FY) 2015. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the SERS Board to consider before GRS, the SERS actuary, finalizes their certification of the required State contributions to the SERS for FY 2015. In accordance with the Act, our review did not include a replication of the actuarial valuation results.

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, 2013 actuarial valuation prepared by GRS, the GRS 2010 Experience Study which included experience investigation of the demographic and economic experience for the SERS for the period July 1, 2005 through June 30, 2010, and the February 2013 GRS study of the valuation interest rate. The materials we reviewed are listed in Appendix B.

Finally, 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, consistent with our initial report, we continue to interpret actuarial practices to mean: (1) does the SERS Board utilize a qualified actuary to prepare the annual actuarial valuation which determines the required State contribution; and (2) does the Board require the actuary to conduct 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, 2013 actuarial valuation. Future reports may examine additional actuarial practices of the Board.

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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, 2013 Actuarial Valuation Report of SERS. Detailed analysis and rationale for these recommendations can be found in Section III of this report.

**Assessment of Actuarial Assumptions Used in the 2013 Valuation:**

- 1) Public Act 097-0694 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 State Employees' Retirement System 2013 Actuarial Valuation Report and conclude that, while most of the assumptions are reasonable in general, based on the evidence provided to us, we are not comfortable with the continued use of a 7.75% interest rate assumption. In the 2012 report to the Auditor General and SERS, we recommended that the SERS Board consider lowering the interest rate for this 2013 valuation. We now urge the Board to lower the assumption to 7.25% or lower for the upcoming June 30, 2014 actuarial valuation. If the Board concludes that this reduction is not needed, we request that SERS provide substantial justification for using a higher interest rate.

**Recommended Additional Disclosures for the 2013 Valuation:**

- 2) For several consecutive years, there have been significant losses due to retirees from active status which GRS has explained as being an "extraordinary event which would be difficult to predict." Given that this event has happened for at least six consecutive years, we believe that additional analysis and more thorough disclosure is required to help determine the source of these losses. This same recommendation was made last year, but no evidence of additional analysis is included in the draft June 30, 2013 Actuarial Valuation Report. We strongly recommend the source for this loss be explained and, if possible, prefunded through an appropriate assumption.

**Recommended Changes for Future Valuations:**

- 3) We recommend again, as we did last year, that GRS consider, in future valuations, increasing the 1% of salary load for disability benefits to tie into the trend demonstrated in the 2010 Experience Review study and better cover the cash outflows for disability benefit payments.
- 4) We recommend again, as we did last year, that GRS consider in future valuations establishing a corridor around the market value of assets of 80% to 120% beyond which the actuarial value is limited, given the use of the actuarial value of assets in the projection methodology in accordance with Public Act 96-0043. While this change would have no impact on the System for the June 30, 2013 valuation, we believe it would be better to establish this corridor before it is actually applicable.

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**SECTION II - SUMMARY OF RECOMMENDATIONS**

- 5) We recommend the Board annually review the economic assumptions (interest rate and inflation) each year prior to commencing the valuation work, and adjust assumptions accordingly.
- 6) We recommend that GRS consider using a fully generational mortality table so that future mortality improvements will continue to impact new entrants throughout the projection period ending in 2045.
- 7) We have several minor recommendations to future reports. These include:
  - a. Full disclosure of assumptions with respect to 415(b) limits, 401(a)(17) limits, and the COLA for Tier 2, along with the growth rates for these.
  - b. Consider whether additional revisions to the demographic assumptions, specifically the termination assumption, for Tier 2 members are appropriate to their benefit structure and consistent with the revised retirement rates already implemented.
  - c. Disclosure of additional information as to how the New Entrant Profile is developed. Specifically, we recommend GRS include all relevant information for each New Entrant Profile group such as age and salary distributions, and gender. This to better comply with ASOP No. 41 dealing with actuarial communications.

**Proposed Certification of the Required State Contribution**

- 8) GRS has determined that the FY 2015 required State contribution calculated under the current statutory funding plan is \$1,748,430,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and reviewed the assumptions on which it is based. In verifying these calculations, we have accepted GRS's annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions. We recommend that GRS continue to disclose in future valuations the above items in order for us to continue to perform an analysis of the required State contribution.
  - a. We again recommend that GRS provide the projections by year of future benefit payouts split by actives and current inactives, separate from expenses, instead of the aggregate number, including expenses, that they provided for 2013. In addition, we would also request again, as we did last year, that GRS include the historic development of assets without the General Obligation Bonds (GOB).
  - b. All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.

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SECTION II - SUMMARY OF RECOMMENDATIONS

**State Mandated Funding Method**

- 9) The current statutory funding plan calculates the minimum contribution to SERS for each fiscal year as the amount sufficient to cause the total assets of the System to equal 90% of the total liabilities of the System by the end of Fiscal Year 2045. **This funding method does not meet actuarial standards of practice because the system is not funded to 100% and the funding of the plan is pushed back to later years. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of SERS.** Also, based on the draft 2013 Actuarial Valuation Report, the funded ratio is only 34.2%, based on the actuarial value of assets as a ratio over the actuarial liability. We have concerns about the solvency of the System if there is a significant market downturn. **We suggest that the SERS Board always use the conservative end of any range of assumptions recommended by GRS due to the systematic underfunding of the System. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.**

### 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.

#### **A. Economic Assumptions**

##### *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 last changed in the June 30, 2010 actuarial valuation to 7.75% from 8.50%. This was a partial response to the findings presented in the 2010 Experience Review study performed by GRS.

In Cheiron's 2012 report to the Auditor General and SERS Board we recommended that the Board consider lowering this interest rate further. On December 14, 2012, GRS responded to this recommendation and stated that the Board will be considering this change at future Board meetings. Based on a study performed by GRS in February 2013, the Board did consider a change, but ultimately did not decide to change the rate. We understand that one of the reasons the Board did not lower the interest rate was based on GRS's advice that the current 7.75% interest rate was within a reasonable range.

**After reviewing all the materials (see Appendix B of the report) that were made available, Cheiron recommends the Board lower the interest rate assumption from 7.75% to 7.25% or lower for the upcoming June 30, 2014 valuation. If the Board concludes that this rate reduction is not needed, we request that SERS provide substantial justification for using a higher interest rate, in light of the evidence we present below (Recommendation #1).**

*Our rationale for this recommendation is as follows:*

- As reported by GRS to the SERS Board on February 5, 2013, the expected average geometric returns on SERS' investments over the next 30 years developed by eight national investment consulting firms is 7.09%.
- GRS also reported in that same presentation that the probability of meeting or exceeding the 7.75% assumption is 38.6%. We believe that selecting an assumption that has a 61.4% chance of not being met is unreasonable.
- GRS, in their draft June 30, 2013 valuation, is reporting a funded ratio (actuarial value of assets over actuarial liabilities) of 34.2%, which indicates the plan will require significant future funding. Even though a more realistic interest rate assumption would drop that ratio below 30%, it would also require expedited funding of the System going forward.

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- We note that our report last year recommended that the Board consider lowering its interest rate. GRS presented an interest rate study in February 2013. At the July 2013 Board meeting, when asked by a Board member whether it was reasonable to utilize a 7.75% interest rate when the expectations were much lower, GRS responded that it was reasonable “as long as the interest rate was in the range of the 25<sup>th</sup> to 75<sup>th</sup> percentile of expectations.” GRS technically adhered to an existing Actuarial Standard of Practice (ASOP No. 27) in developing the interest rate assumption by concluding that as long as the assumption was within the 25<sup>th</sup> to 75<sup>th</sup> percentile of expected returns, then the assumption is reasonable. However, a new standard has been developed, effective September 2014. The language in the new standard, which has been known for the last two years, requires that the assumption “has no significant bias (i.e., it is not significantly optimistic or pessimistic).” In our opinion, applying an assumption that has a 38.6% chance of being achieved is significantly optimistic.
- The Judges’ Retirement System (JRS) and the General Assembly Retirement Systems (GARS) have their investments commingled with the SERS investments and managed as one large investment pool. Both JRS and GARS utilize GRS as their actuary, and both Systems have a 7.0% interest rate assumption. We do not understand how GRS can justify a 7.0% assumption for JRS and GARS, and a 7.75% assumption for SERS.
- The Statutory funding requirement cannot be ignored in the choice of an appropriate interest assumption. Fundamental to the Statute is the requirement to determine the appropriate portion of unfunded liability to be funded each year that produces a level amortization amount as a percent of future projected payroll. If the interest assumption is expected to result in a higher likelihood of returns below the rate than above, as presented in the 2012 interest rate study by GRS, than by definition, this will produce future losses and an increasing amortization amount as a percent of payroll.

**We continue to recommend, as we did last year, that the Board annually review the interest rate assumption, and this year further recommend that the inflation rate assumption also be part of the annual review. This is as opposed to the current process of waiting for the completion of a formal Experience Review study (Recommendation #5).**

*Our rationale for this recommendation is as follows:*

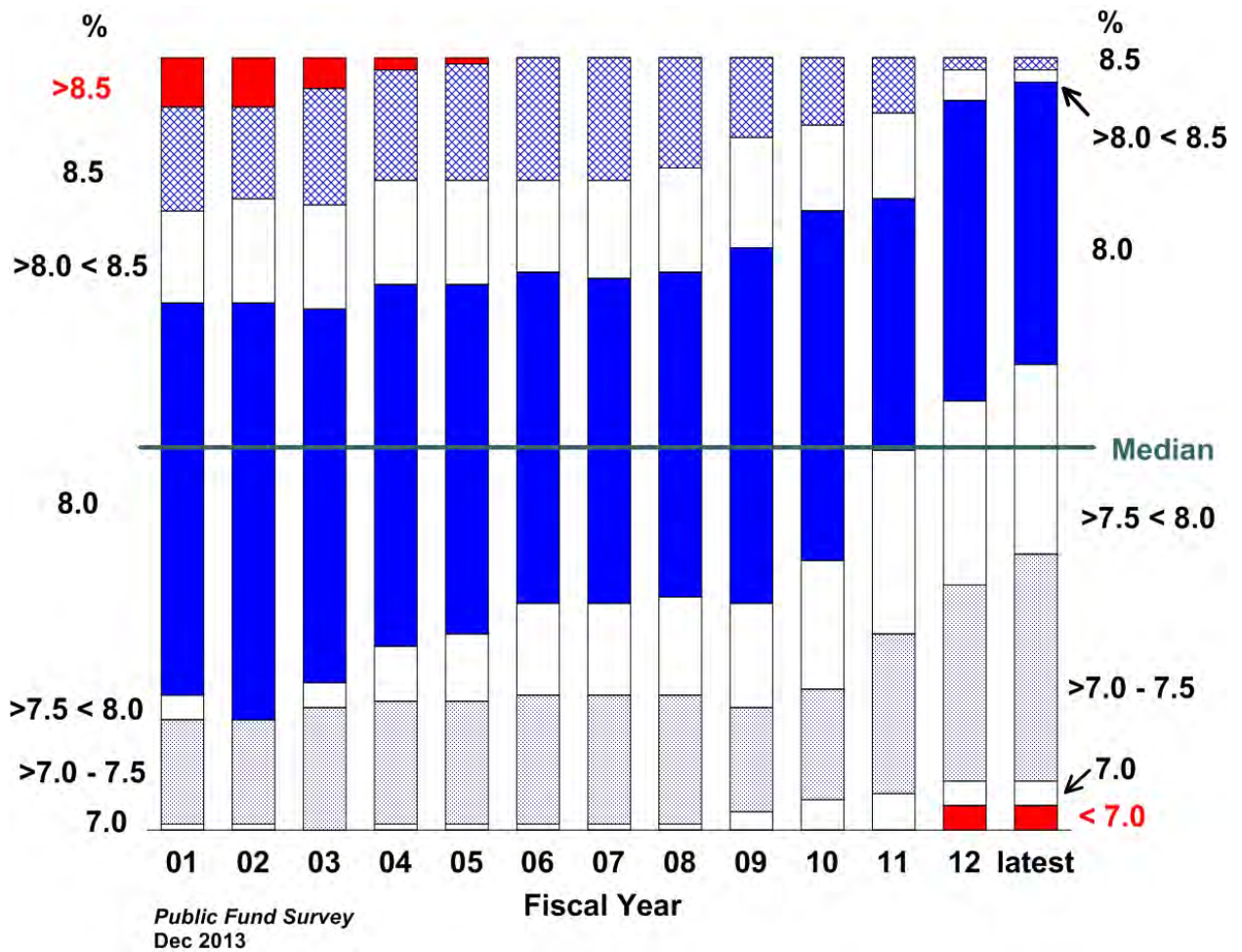
- A review of the interest and inflation rates does not involve the collection of significant data, and can easily be updated annually. In addition, it keeps the Board focused more closely on these very important assumptions.
- In GRS’s February 2013 discount rate study, they presented the opinions of eight independent investment consultants on the future expected earnings of the System. Also, they presented the cost impact of moving to a 7.5% assumption. We believe that more information is needed by the SERS Board. Such information includes future expectations

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of the Illinois State Board of Investment (ISBI), the risk preference of the SERS Board, and an examination of industry trends, such as what other plans are doing, Moody's recent pronouncements, GASB 67 and 68 impact on the interest rate, and various activities taking place at U.S. federal agencies and professional organizations.

- The National Association of State Retirement Administrators (NASRA) conducts an annual survey of public funds. The latest Public Fund Survey covers 126 large retirement plans. The following chart shows the distribution of investment return assumptions for the last 12 years of their survey. The latest data includes results collected through December 2013.

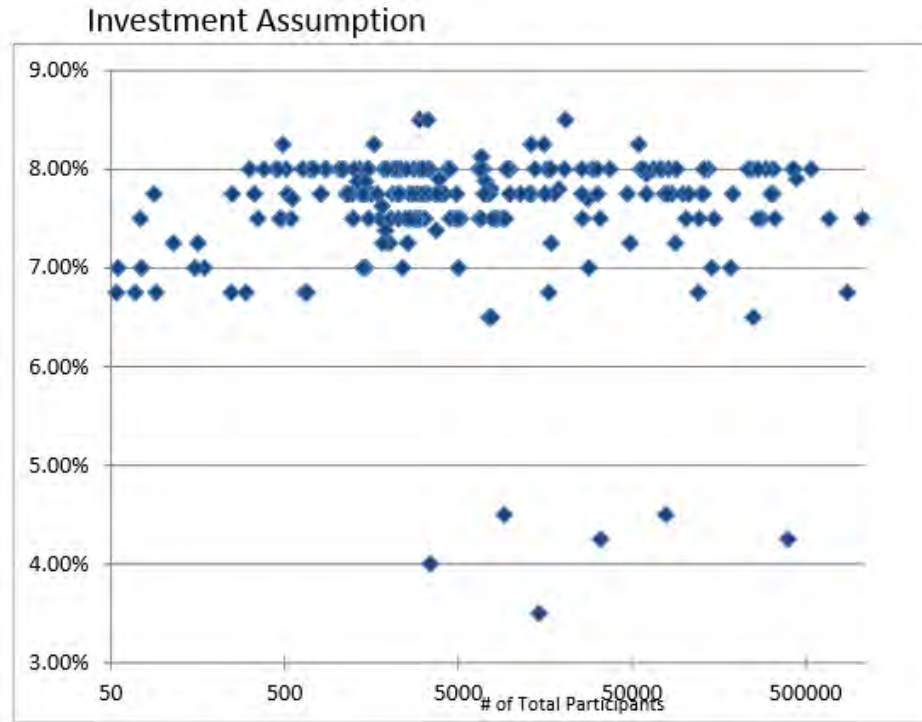


Over the period shown in the latest survey, there continues to be a pattern of reducing investment return assumptions. 42 of the 126 plans have reduced the interest rate assumption since Fiscal Year 2011. Of the nine plans in the survey that indicate an interest rate reduction since Fiscal Year 2012, the median reduction is 0.43%. The survey is consistent with experience of other Cheiron clients, with which there has been a significant trend to reduce the investment return assumptions in the last three years.

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- The following chart from page 11 of the October 2013 *National Conference on Public Employees Retirement Systems (NCPERS) Public Fund Study* shows the rates used nationwide by public sector pension plans.



As part of the study, NCPERS identified that the average investment assumption for the 241 state and local pension plan respondents was 7.6%, and that it was anticipated that 40% have reduced this assumption compared to the 2012 study.

- *Pension Industry (actuarial, accounting, legal, and investment professional organizations) pressures may lead to mandated lower interest rates:* In recent years, there has been increased and controversial movement in the actuarial community that actuaries must move away from this traditional theory where the assumed interest assumption is based on expected plan earnings, and instead employ theories espoused by financial economists. Under financial economic theory, the interest rate used to value pension plan liabilities should be based on near risk free rates of return, because pension liabilities (or benefit payments) are considered more akin to bonds, and that using the higher expected earnings rates hides the risks of achieving that return. Near risk free rates of return today would be less than 4% and would enormously increase the liabilities of SERS and the resulting required State contribution. While this debate continues and has not been resolved, there are external signs that the public sector may ultimately be forced to utilize much lower investment assumptions.



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- New GASB 67 and 68 pronouncements may subject many public pension plans, such as SERS, to effectively use a lower interest rate for accounting disclosures and pension expense determinations in fiscal years 2014 and 2015, respectively. It is important to note, however, that the new standards do not define funding requirements for a plan.
- Moody's, an organization that provides bond rating information for private investors, has recently announced that they propose to compare the financial viability of public sector pension plans by using, among other things, a 5.67% interest rate assumption.
- The federal government, which promulgates minimum funding standards for corporate pension plans, already requires corporate pension plans to utilize interest assumptions that are based on short-term and mid-term bond rates, which are very low.

2. *Inflation Assumption:*

**We find the inflation assumption of 3.00%, which primarily impacts the salary increase assumption, used in the 2013 actuarial valuation by GRS in certifying the required State contribution is reasonable.**

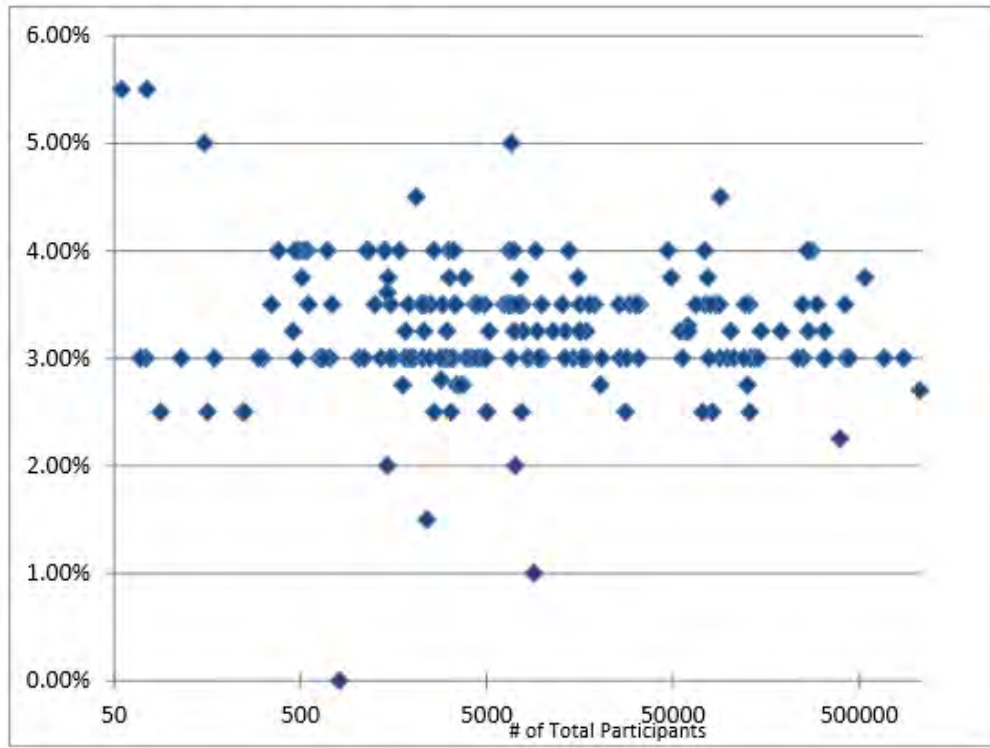
*Our rationale for concurring with the 3.00% assumption:*

- The 2013 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years) inflation will average somewhere between 1.8% and 3.8%.
- As shown on pages 7 and 8 of the GRS 2010 Experience Review study, there continues to be support for this assumption as a long-term rate even though the historic short-term averages are being lowered by the current historically low rates.
- Our comparison of other public sector retirement systems' inflation assumptions as shown by surveys published by Boston College's Center of Public Research (CPR) shows that most public sector pension plans utilize an inflation assumption in the range of 2.75% to 3.75%.
- A *National Conference on Public Employers Retirement Systems* (NCPERS) 2013 study, provides the following graphic of respondents' inflation assumptions:

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Inflation Assumption



This shows that the 3.0% assumption, which SERS uses, is a prevalent inflation assumption among the 241 systems who responded to this study, with 3.3% as the average.

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**SECTION III - SUPPORTING ANALYSIS**

3. *Salary (Annual Compensation) Increase Assumption:*

For the draft June 30, 2013 actuarial valuation, the salary scale assumption, which remains the same as it was in 2012, is shown in the table below.

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

<b>Age</b>	<b>Annual Increase</b>
25	8.87%
30	7.25%
35	6.47%
40	5.87%
45	5.41%
50	5.02%
55	4.72%
60	4.44%
65	4.23%
70	4.00%

These increases include a component for inflation of 3.0% per annum.

This assumption was arrived at following the 2010 GRS Experience Review study and first implemented in the 2011 valuation.

**We find the assumption and the basis for setting it as reasonable.**

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

- This assumption, which is employer specific, is supported by credible data as shown on pages 12-15 of the 2010 Experience Review study performed by GRS.
- During the year ending June 30, 2013 there were \$146 million of experience gains from this assumption (i.e., salary increases were less than assumed) as shown on page 17 of the draft June 30, 2013 GRS Actuarial Valuation Report. However, this one year experience should not be a consideration for changing this assumption long term, and a more formal experience study where individual membership salary data is collected, is a better venue for arriving at an informed decision here.
- In our own experience with our public sector pension plans (about 60 large plans), we have witnessed a consistent recent trend of declining salary increases for public sector employees which was addressed when the assumption was changed effective for the June 30, 2011 valuation.

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#### 4. *Other Economic Assumptions:*

**We recommend that GRS disclose the additional economic assumptions that they utilize, including 415(b) limits, 401(a)(17) limits, and the COLA for Tier 2 along with the growth rates for these (Recommendation #7a).**

#### **B. Demographic Assumptions**

For the draft June 30, 2013 actuarial valuation, GRS has maintained the same assumption changes used in the prior valuation and first adopted in the June 30, 2011 actuarial valuation. This includes modifications recommended in the 2010 Experience Review study.

Out of the demographic assumptions, there are four assumptions that are of interest.

#### 1. *Disability:*

Typically retirement systems fund disability payments using probabilities of disablement by age. For SERS, GRS does not use such probabilities and they state in their valuation report (page 38) "*Because members who receive disability benefits typically spend less than one year on disability, they are considered active members. Therefore, a load of 1.00% of pay on the normal cost is applied to reflect the near-term cash flow.*"

While this is a minor component of the total cost of SERS, if the actual disability payouts are running 115% to 125% of the expected normal cost for disability, then an adjustment is needed. In our 2012 report to the Auditor General and SERS, we recommended an alternative assumption of 110% of prior year disability payments. While GRS responded on December 14<sup>th</sup>, 2012 that they would look into this for their 2013 actuarial valuation, there is no evidence that they did.

**We continue to recommend that GRS in future valuations consider increasing the 1% of salary load for disability benefits to tie into the trend demonstrated in the 2010 Experience Review study and to better cover the cash outflows for disability benefit payments (Recommendation #3).**

#### 2. *Recurring Loss:*

Another issue in the valuation results that raises a concern, which we reported last year and we continue to recommend that it should be reviewed and commented on in the valuation report, is the experience loss attributable to retirements from active status. In 2013 the loss was \$146 million (see page 17 of the draft 2013 Actuarial Valuation Report). This is a material and recurring source for loss to the System (in 2012 the loss was \$395 million, in 2011 the loss was \$264 million, in 2010 the loss was \$203 million, in 2009 the loss was \$201 million, and in 2008 it came to \$224 million). This is neither discussed as a source nor

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reflected as an issue in the recent 2010 Experience Review study. Instead GRS refers to this item as an “extraordinary event” which would be difficult to predict in the future.

**We strongly recommend the source for this loss be explained and, if possible, prefunded through an appropriate assumption (Recommendation #2).**

*3. Termination:*

Illustrative rates of withdrawal from the System are as follows:

Service (Beginning of Year)	<b>Service Based Withdrawal</b>			
	<u>General Formula Employees</u>		<u>Alternate Formula Employees</u>	
	Males	Females	Males	Females
0	0.1800	0.1700	0.0400	0.0775
1	0.1200	0.1100	0.0250	0.0475
2	0.0600	0.0850	0.0250	0.0450
3	0.0550	0.0700	0.0250	0.0300
4	0.0500	0.0550	0.0250	0.0300
5	0.0450	0.0500	0.0250	0.0300
6	0.0350	0.0400	0.0150	0.0300
7	0.0300	0.0350	0.0150	0.0300
8	0.0300	0.0250	0.0150	0.0300
9	0.0250	0.0250	0.0150	0.0200
10	0.0200	0.0250	0.0150	0.0200
11	0.0200	0.0200	0.0100	0.0175
12	0.0200	0.0200	0.0100	0.0175
13	0.0200	0.0200	0.0100	0.0175
14	0.0150	0.0150	0.0100	0.0175
15	0.0150	0.0150	0.0100	0.0100
16	0.0150	0.0150	0.0075	0.0100
17	0.0125	0.0150	0.0075	0.0100
18	0.0125	0.0150	0.0075	0.0100
19	0.0125	0.0100	0.0075	0.0100
20	0.0100	0.0100	0.0075	0.0100
21	0.0100	0.0075	0.0050	0.0100
22	0.0100	0.0075	0.0050	0.0100
23	0.0100	0.0075	0.0050	0.0100
24	0.0100	0.0075	0.0050	0.0100
25	0.0100	0.0075	0.0050	0.0100
26	0.0100	0.0075	0.0050	0.0100
27	0.0100	0.0075	0.0050	0.0100
28	0.0100	0.0075	0.0050	0.0100

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Service (Beginning of Year)	Service Based Withdrawal			
	<u>General Formula Employees</u>		<u>Alternate Formula Employees</u>	
	Males	Females	Males	Females
29	0.0100	0.0075	0.0050	0.0100
30+	0.0100	0.0075	0.0050	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.

**We recommend that GRS consider using a separate set of termination rates for Tier 2 for the same reasons they found adjusting the retirement rates for Tier 2 necessary, the lower benefits available to Tier 2 members.** This will improve GRS's compliance with the ASOP No. 35 requirement for consistency within assumptions (Recommendation #7b).

4. *Mortality:*

For the current valuation, GRS updated the post-retirement mortality table to the RP-2000 Combined Healthy Mortality Table, sex distinct, projected to 2015 (static table). They also updated the pre-retirement mortality to be 85% of the new post-retirement mortality for males and 70% of the new post-retirement mortality for females.

ASOP No. 35 requires that actuaries at least consider projections of mortality improvements, and if there is not such an assumption for improvement, the actuary must disclose the basis for not making the assumption of mortality improvement. With the new table adopted, GRS does project mortality improvement, to 2015. **We recommend using a fully generational mortality table for future valuations. A fully generational mortality table has mortality improvements automatically built-in for new members entering the System, which is important given that open group projections through 2045 provide the basis for the calculated contribution rates** (Recommendation #6).

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**Below we summarize all remaining demographic assumptions which we reviewed and have concluded are reasonable and meet the requirements of ASOP No. 35, section 3.3.4.**

**1. 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.

**2. 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) of benefits provided under Social Security is as great as their spouses' PIA. Sixty percent of married male members are assumed to have a dual income household. For the dual income household, it is assumed the offset at age 60 is 45.0% 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 law (40 ILCS 5/14-119).

**3. 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 General Formula Employees**

	<b>Males</b>	<b>Females</b>
50	5.00%	5.00%
51	5.00%	5.00%
52	15.00%	15.00%
53	12.00%	15.00%
54	15.00%	15.00%
55	12.00%	13.00%
56	10.00%	13.00%
57	10.00%	13.00%
58	10.00%	13.00%
59	10.00%	13.00%
60	10.00%	13.00%
61	10.00%	10.00%
62	15.00%	17.50%
63	12.50%	15.00%
64	12.50%	15.00%
65	20.00%	25.00%
66	20.00%	20.00%

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**Retirement Rates for General Formula Employees**

	<b>Males</b>	<b>Females</b>
67	12.50%	20.00%
68	12.50%	15.00%
69	12.50%	15.00%
70	100.00%	100.00%

**Early Retirement Rates for General Formula Employees**

	<b>Males</b>	<b>Females</b>
55	5.50%	6.00%
56	6.00%	6.00%
57	7.50%	8.00%
58	9.00%	8.00%
59	12.00%	18.00%

**Retirement Rates for Alternate Formula Employees**

	<b>Males</b>	<b>Females</b>
50	50.00%	50.00%
51	35.00%	25.00%
52	35.00%	40.00%
53	35.00%	40.00%
54	35.00%	30.00%
55	35.00%	30.00%
56	20.00%	25.00%
57	20.00%	25.00%
58	20.00%	25.00%
59	20.00%	20.00%
60	30.00%	20.00%
61	30.00%	30.00%
62	45.00%	40.00%
63	30.00%	25.00%
64	30.00%	25.00%
65	50.00%	40.00%
66	20.00%	40.00%
67	30.00%	40.00%
68	50.00%	40.00%
69	50.00%	40.00%
70	100.00%	100.00%



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**4. Assets**

Assets available for benefits are used as described on page 44 of the most recent valuation report.

**5. Expenses**

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

**6. Spouse's Age**

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

**7. 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 of 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

**8. 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.

**9. Missing Data**

If earnings were 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. If a birth date was not available, the member was assumed to be age 35.

**10. Decrement Timing**

Decrements are assumed to occur mid-year.

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**11. Decrement Relativity**

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

**12. Decrement Operation**

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

**13. Eligibility Testing**

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

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

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

Retirement rates for Tier two members eligible for regular formula benefits account for the change in retirement age, as follows:

<b>Age</b>	<b>Members Eligible for Normal Retirement</b>	<b>Age</b>	<b>Members Eligible for Early Retirement</b>
67	50.0%	62	30.0%
68	75.0	63	34.0
69	90.0	64	38.0
70	100.0	65	42.0
		66	46.0

Members hired after December 31, 2010, eligible for the alternate formula benefits will retire according to the age-based retirement rates used in the most recent valuation as follows:

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<b>Age</b>	<b>Male Members Eligible for Normal Retirement</b>	<b>Female Members Eligible for Normal Retirement</b>
60	35.0%	20.0%
61	37.0	15.0
62	38.0	25.0
63	40.0	40.0
64	41.0	40.0
65	80.0	55.0
66	40.0	55.0
67	55.0	45.0
68	55.0	45.0
69	40.0	45.0
70	100.0	100.0

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#### C. 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). Since the amortization basis is governed by State law, we do not comment on it here.

##### *1. 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) funding method as it is more consistent with Public Act 94-0004's requirement 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 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 value increasing, while the PUC method is not an unreasonable method, more plans use the Entry Age Normal (EAN) funding method to mitigate this affect. It should also be noted that the EAN method will be the required method to calculate liability for GASB 67 & GASB 68.

##### *2. Asset Smoothing 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 that fluctuations in the actuarial value of assets will be less volatile over time than fluctuations in the market value of assets. **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 actuarial cost, and we concur with its use.**

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 (IRS) mandates this "corridor" for private sector pension plans (a 90%-110% corridor is mandated). Even though it is not mandated for public plans, we believe that the use of this type of corridor is a much sounder actuarial practice, and according to ASOP No. 44 in Section 3.3 b

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1, the actuarial value of assets should "...fall within a reasonable range around the corresponding market value." **Therefore, we recommend that the SERS Board consider moving to this approach in future valuations** (Recommendation #4). It's important to note that currently a move to this corridor approach would have no impact on the 2013 actuarial valuation results, as the actuarial value of assets is already within the 80%-120% corridor.

#### **D. Determination of the Required State Contribution**

As required by Public Act 94-0004, in determining the required State contribution under State law, the actuary must determine what level of future contributions is needed to make a projection of the System's funded status in 2045 be at 90%. To make that determination, the actuary needs to make an assumption regarding the age/sex/salaries of new hires that replace existing members leaving over this period. This assumption is commonly referred to as the "New Entrant Profile." In addition to making that assumption, the actuary needs to apply actuarial methodologies to project the June 30, 2013 valuation into the future.

The "New Entrant Profile" assumption is a critical assumption as the required projection of 90% funding in the year 2045 means that the majority of active members will be new hires after the current June 30, 2013 valuation. **Therefore, we recommend that GRS disclose additional information in their valuation report as to how the New Entrant Profile, which is shown on page 39 of their June 30, 2013 Actuarial Valuation, was developed. In addition, we recommend GRS include all relevant information regarding the New Entrant Profile in the valuation report in order to better comply with ASOP No. 41 dealing with actuarial communications** (Recommendation #7c).

**We also recommend that GRS disclose in future valuations items needed to perform a more comprehensive analysis of GRS's determination of the System's funded status in 2045.** The specific items are outlined on page 3 in Section II: Proposed Certification of the Required State Contribution (Recommendation #8). We believe these would be appropriate disclosures under ASOP No. 41 and that the additional information will allow us to perform a more comprehensive analysis of GRS's determination of the required State contribution.

#### **E. Other Issues**

##### *1. State Mandated Funding Method:*

In its draft 2013 Actuarial Valuation Report on pages 11-13, GRS offers commentary on the Statutory funding method from an actuarial point of view. They describe the Annual Required Contribution (ARC) under GASB 25 and 27 as a method designed to finance benefits for current participants to a 100% funding target over a projected period not to exceed 30 years, and which is often used as a de facto funding method. They contrast the ARC funding method with the current Statutory method and note that the Statutory policy produces a back-loaded contribution projection, where contributions are significantly

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deferred into the future. They also provide a chart on page 11 that “illustrates how significantly the current funding policy defers contributions into the future”.

GRS advises “strengthening the current statutory funding policy”, and provides the following examples:

- a. Reducing the projection period needed to reach 90 percent funding;
- b. Increasing the 90 percent funding target;
- c. Separating the financing of benefits for members hired before and after December 31, 2010; and
- d. Changing to an ARC based funding approach with an appropriate amortization policy for each respective tiered benefit structure.

Illinois Pension Code (40 ILCS 5/14-131) is limited in meeting the risks of the System. This law requires that the actuary base the required contribution using a prescribed funding method that achieves a 90% funding in the year 2045.

**We concur with the GRS recommendations to increase the 90% funding target and to reduce the projection period, in accordance with generally accepted actuarial practices. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of SERS.**

It may be illustrative to include a comparison of the projected contributions and funded ratios under some combination of the items above as well.

**We suggest due to the systematic underfunding of the System that the SERS Board always use the conservative end of any range of assumptions recommended by GRS. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn (Recommendation #9).**

2. *State Mandated Projection Method:*

Under Public Act 96-0043 the actuarial methodologies utilized in performing the 2045 projection of the System’s funded status assume the future earnings rate (currently at 7.75%) is applied to the actuarial value of assets (AVA) rather than the market value of assets (MVA). GRS included an illustration of projected AVA with a phase in of the asset smoothing method gains and losses. We agree that this approach provides a more realistic expectation of the future direction of the contribution level. We have similar concerns over the implications of the law under the Act.

The table below demonstrates what the market value would have to earn for the actuarial value to earn 7.75% based on the ratio of actuarial value to market value. We recommend that consideration be given to require that the projected future earnings of the System be based on starting market values of assets (rather than a smoothed value).

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**What the market value of assets (MVA) would need to earn in a given year, if the actuarial value of assets (AVA) are assumed to earn 7.75%, at various ratios of**

<u>Ratio of AVA to MVA</u>	<u>Required MVA Return</u>
130.00%	79.37%
125.00%	67.44%
120.00%	55.50%
115.00%	43.56%
110.00%	31.63%
105.00%	19.69%
100.00%	7.75%
95.00%	-4.19%
90.00%	-16.13%
85.00%	-28.06%
80.00%	-40.00%
75.00%	-51.94%
70.00%	-63.88%

**F. Preparations for GASB 67 & 68**

The Governmental Accounting Standards Board (GASB) adopted Statement No. 67 (GASB 67) **Financial Reporting for Pension Plans—an amendment of GASB Statement No. 25** and Statement No. 68 (GASB 68) **Accounting and Financial Reporting for Pensions—an amendment of GASB Statement No. 27**. GASB 67 is effective for periods beginning after June 15, 2013 and GASB 68 is effective for fiscal years beginning after June 15, 2014. The following is a brief summary of some of the changes contained in these statements:

- The Total Pension Liability will be calculated using the individual entry age actuarial cost method.
- A new blended discount rate assumption will be based on (1) a long-term expected rate of return on pension plan investments to the extent that assets are projected to be sufficient to pay benefits based on future contributions intended to finance current member benefits (i.e., excluding normal cost contributions for new entrants) and (2) a tax-exempt, high-quality municipal bond rate to the extent that the conditions for use of the long-term expected rate of return are not met. This will likely mean the discount rate will be reduced if projected contributions plus assets are not able to cover projected pension benefits.

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- The Unfunded Actuarial Liability, now called Net Pension Liability, will be calculated using the market value of assets instead of the smoothed actuarial value of assets.
- The entire Net Pension Liability will be recognized immediately on the employer's statement of net position.
- The Annual Required Contribution (ARC) has been eliminated. The new Pension Expense which equals: Normal Cost + Interest Cost - Expected Asset Earnings + Amortization of changes in total pension liability +/- five year differences on the actual vs. expected asset returns.
- Recognition periods of unexpected changes in net pension liability would vary depending upon the source for the change. These periods would be immediate for plan changes, five years for the difference between projected and actual investment earnings, and expected working lifetime of both active and inactive members for other total pension liability changes.

We have reviewed the System's strategy for implementing GASB 67 and 68 and summarized below.

- 1. The implementation, reporting, measurement and valuation dates for GASB 67 and 68**
  - SERS will implement GASB 67 for their Fiscal Year 2014 (July 1, 2013 – June 30, 2014) Comprehensive Annual Financial Report.
  - SERS did not specify a date planned to implement GASB 68.
  - SERS has not determined the valuation date for GASB 67 & GASB 68.
- 2. The method that will be used to develop the annual financial reporting**

SERS plans to reach out to their actuaries for further guidance, but at this point has not determined the method that will be used.
- 3. The projected "crossover" date (date of asset depletion) if any**

SERS plans to reach out to their actuaries for further guidance, but at this point has not determined a crossover date.
- 4. The bond index that will be used to develop the discount rate for the period after the crossover date**

SERS plans to reach out to their actuaries for further guidance, but at this point has not determined the bond index that will be used.
- 5. The projected blended discount rate used for developing Net Pension Liability (NPL)**

SERS plans to reach out to their actuaries for further guidance, but at this point has not estimated a projected blended discount rate.



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- 6. Expected allocation method of NPL among employers if cost sharing plan**  
SERS plans to reach out to their actuaries for further guidance, but at this point has not determined an allocation method.
  
- 7. Any unresolved issues concerning the implementation of either GASB 67 or 68**  
Significant additional planning will be required of SERS prior to implementation GASB 67 and GASB 68.

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

**Response to recommendations in 2012:**

In the State Actuary's Preliminary Report on the State Employees' Retirement System of Illinois presented December 10, 2012 Cheiron made several recommendation. Below we summarize how these recommendations were reflected in this year's valuation report.

<b>State Employees' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
<b><i>Recommended Changes to Actuarial Assumptions Used in the 2012 Valuation</i></b>		
Cheiron concluded the assumptions were reasonable and had no recommended changes to the assumptions.		
<b><i>Recommended Additional Disclosures for the 2012 Valuation:</i></b>		
1. We recommend GRS offer an explanation of the \$395 million loss due to retirees from active status as this item has created a source for recurring loss. Additional disclosure will help determine if there is an emerging trend not adequately captured by the assumptions.	Not Implemented	Comments on this loss are not any more detailed than those provided in the 2012 valuation.  <b>Recommendation repeated and expanded.</b>
<b><i>Recommended Changes for Future Valuations:</i></b>		
1. To ensure expected future costs can be determined as a level percent of payroll as called for by the Illinois Pension Code (40 ILCS 5/14-131), we recommend the Board consider reducing the interest rate assumption to the level recommended in the Experience Review study to the level expected to result in returns equally above or below the assumptions.	Not Implemented	Although the Board may have reviewed the interest rate assumption, no change to the rate has been made.  <b>Recommendation repeated and expanded.</b>
2. We recommend GRS consider, in future valuations, increasing the 1% of salary load for disability benefits to tie into the trend demonstrated in the 2010 Experience Review study and better cover the cash outflows for disability benefit payments.	Not Implemented	This has not been addressed in the 2013 valuation.  <b>Recommendation repeated.</b>
3. We recommend GRS consider, in future valuations, establishing a corridor around the market value of assets of 80% to 120% beyond which the actuarial value is limited	Not Implemented	This has not been addressed in the 2013 valuation.  <b>Recommendation repeated.</b>

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

<b>State Employees' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
given the use of the actuarial value of assets in the projection methodology in accordance with the Statute.		
4. We recommend that GRS disclose, in future valuations, the specific data referred to in the description as to how the New Entrant Profile assumption was developed.	Partially Implemented	This has been partially addressed on page 39 of the 2013 valuation. Additional information has been requested in this report under Recommendation 7c.
<b><i>Proposed Certification of the Required State Contribution:</i></b>		
1. We recommend that GRS continue to disclose in the June 30, 2013 and later valuations the following items in order for us to continue to perform an analysis of the required State contribution in the future:		
<ul style="list-style-type: none"> <li>• Projections by year of future benefit payouts split by actives and current inactive (i.e. retirees, survivors, disabled, and deferred vested);</li> </ul>	Mostly Implemented	This has been mostly addressed in Table 4b of the 2013 valuation. However additional breakdowns are still needed as noted under our Recommendation 8a.
<ul style="list-style-type: none"> <li>• The present value of future benefits by year for actives, terminated vested, retirees and beneficiaries, and disabled members;</li> </ul>	Mostly Implemented	This has been mostly addressed in Table 8 of the 2013 valuation. However, additional breakdowns are still needed as noted under our Recommendation 8b.
<ul style="list-style-type: none"> <li>• A historic development of assets without General Obligation Bonds (GOBs).</li> </ul>	Not Implemented	Significant questions remain on the projections that are fundamental to the development of the Required State Contributions.  <b>Recommendation repeated.</b>

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<b>State Employees' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
2. All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.	Implemented	This has been addressed in Tables 7-9 of the 2013 valuation.

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**Chapter Five**

**PRELIMINARY REPORT ON THE  
JUDGES' RETIREMENT SYSTEM**

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In accordance with Public Act 097-0694, 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 December 4, 2013. The preliminary report was based on Cheiron's review of actuarial assumptions included in JRS' 2013 Actuarial Valuation.

Following is Cheiron's final preliminary report on the Judges' Retirement System. JRS' written response, provided on December 16, 2013, can be found in Appendix C.



December 19, 2013

Mr. William G. Holland  
 Auditor General  
 740 East Ash Street  
 Springfield, Illinois 62703

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

Dear Ladies and Gentlemen:

In accordance with Public Act 097-0694, 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) for Fiscal Year 2015. This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices, which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**In summary, our review of the assumptions and methods used in the June 30, 2013 Actuarial Valuation, which were used to determine the required Fiscal Year 2015 State contribution, found that the assumptions were reasonable, both individually and in the aggregate.** However, we do have some recommended changes for the JRS Board to consider for future valuations. Details on our recommendations can be found in the report that follows. Please provide written responses to the recommendations by the close of business on December 16, 2013.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings. Section III provides the supporting analysis for those findings, presents more details on our assessment of the actuarial assumptions and methods employed in GRS's actuarial certification, and details our assessment of GRS's determination of the required State contribution for Fiscal Year 2015. Finally, in Section III, we comment on other issues impacting the funding of JRS, including the implications of Article 18 of the Illinois Pension Code, which establishes the statutory funding requirements for the System. **In our opinion, the statutory mandated minimum funding requirements call for inadequate funding, and do not meet generally accepted actuarial standards of practice.**



In preparing this report, we relied on information (some oral and some written) supplied by JRS, GRS, and Goldstein & Associates. This information includes actuarial assumptions and methods adopted by the JRS Board, System provisions, summarized census data, the draft 2013 Actuarial Valuation Report, the 2010 Experience Study, and the March 29, 2013 GRS Experience Review presentation. The body of our report provides a detailed description of all information provided for this review.


To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,  
Cheiron



Elizabeth Wiley, FSA, FCA, EA, MAAA  
Associate Actuary



Kenneth A. Kent, FSA, FCA, EA, MAAA  
Principal Consulting Actuary



**THE STATE ACTUARY'S PRELIMINARY REPORT ON THE  
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**SECTION I - REPORT SCOPE**

Under Illinois Public Act 097-0694 (the Act) Cheiron, as the State Actuary, is required to review the actuarial assumptions and valuation of the Judges Retirement System of Illinois (JRS) for the proposed certification prepared by Gabriel Roeder Smith & Company (GRS) of the required State contribution for Fiscal Year (FY) 2015 and issue this preliminary report to the JRS Board. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the JRS Board to consider before GRS, the JRS actuary, finalizes their certification of the required State contribution to JRS for FY 2015. In accordance with the Act, our review did not include a replication of the actuarial valuation results.

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 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, 2013 Actuarial Valuation prepared by GRS, the information reviewed for our 2012 report, and the Experience Review presentation by GRS dated March 29, 2013. The materials we reviewed are listed in Appendix B.

Finally, 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 JRS Board. While the term "actuarial practices" was not defined in the Act, consistent with our initial report, we continue to interpret actuarial practices to mean: (1) does the JRS Board utilize a qualified actuary to prepare the annual actuarial valuation which determines the required State contribution; and (2) does the Board require the JRS actuary to conduct periodic formal experience studies to justify the assumptions used in the actuarial valuations? In addition, we have included comments on actuarial communication and compliance with Actuarial Standards of Practice (ASOP) reflected in the draft June 30, 2013 Actuarial Valuation. Future reports may examine additional actuarial practices of the JRS Board.

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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, 2013 Actuarial Valuation Report of JRS. Detailed analysis and rationale for these recommendations can be found in Section III of this report.

**Assessment of Actuarial Assumptions Used in the 2013 Valuation:**

Public Act 097-0694 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 2013 JRS Actuarial Valuation Report and conclude that they are reasonable. Consequently, we do not have any recommended changes to the assumptions for the 2013 Actuarial Valuation.

**Recommended Changes for Future Valuations:**

1. While we found the economic assumptions to be reasonable this year, we recommend that the JRS Board annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work, and adjust the assumptions accordingly.
2. We recommend again, as we did last year, that GRS consider in future valuations establishing a corridor around the market value of assets of 80% to 120%, beyond which the actuarial value is limited given the use of the actuarial value of assets in the projection methodology in accordance with Public Act 96-0043. While this change would have no impact on the System for the June 30, 2013 valuation, we believe it would be better to establish this corridor before it is actually applicable.
3. We recommend again, as we did last year, that GRS consider using a fully generational mortality table so that future mortality improvements will continue to impact new entrants throughout the projection period ending in 2045.
4. We recommend that GRS disclose additional information in their valuation report as to how the New Entrant Profile is developed. We recommend GRS include all relevant information regarding the New Entrant Profile, including the distributions rather than just the average values, in the valuation report in order to better comply with ASOP No. 41 dealing with actuarial communications. We also recommend they include gender information, as the mortality assumption is now sex distinct.
5. We have several minor recommendations to future reports:
  - a. We recommend that GRS disclose the additional economic assumptions that they utilize in their actuarial valuation, including 415(b) limits, 401(a)(17) limits, and the COLA for Tier 2, along with the growth rates for these.
  - b. We recommend again, as we did last year that GRS consider using the actual data available rather than an assumption for determining if a member will choose the spousal continuance benefit option that provides a survivor annuity. We further

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**SECTION II - SUMMARY OF RECOMMENDATIONS**

recommend that GRS provide details regarding the election of this provision by the current inactive members in the Participant Data section.

- c. We recommend GRS make and disclose assumptions relating to the incidence of members electing to either freeze their benefit and discontinue contributions or pay contributions only on salary increases once they are eligible to receive the maximum rate of annuity to satisfy Section 4.1.1. of ASOP No. 35.
- d. We recommend that GRS provide additional clarity on the payrolls used in their valuation throughout their report to allow for a more complete evaluation by another qualified actuary as required by actuarial standards of practice.
- e. We recommend that GRS consider whether additional revisions to the demographic assumptions, specifically the termination and salary scale assumptions, for Tier 2 are appropriate to their benefit structure and consistent with the revised retirement rates already implemented.

**Proposed Certification of the Required State Contribution:**

6. GRS has determined that the FY 2015 required State contribution calculated under the current statutory funding plan is \$133,982,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and reviewed the assumptions on which it is based. In verifying these calculations, we have accepted GRS's annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions. We recommend that GRS continue to disclose the above items in future valuations in order for us to continue to perform an analysis of the required State contribution.
  - We again recommend that GRS provide the projections by year of future benefit payouts split by actives and current inactives, separate from expenses, instead of the aggregate number, including expenses, that they provided for 2013. In addition, we would also request again, as we did last year that GRS include the historic development of assets without the General Obligation Bonds (GOB).
  - All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.

**State Mandated Funding Method:**

7. The current statutory funding plan calculates the minimum contribution to JRS for each fiscal year as the amount sufficient to cause the total assets of the System to equal 90% of the total liabilities of the System by the end of Fiscal Year 2045. **This funding method does not meet actuarial standards of practice because the System is not funded to 100% and the funding of the plan is pushed back to later years. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of JRS.**

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Also, based on the draft 2013 Actuarial Valuation Report, the funded ratio is only 28.3%, based on the actuarial value of assets as a ratio over the actuarial liability. We have concerns about the solvency of the System if there is a significant market downturn. **We suggest that the JRS Board always use the conservative end of any range of assumptions recommended by GRS due to the systematic underfunding of the System. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.**

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**SECTION III - SUPPORTING ANALYSIS**

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

**A. Economic Assumptions:**

*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 7.00% for the 2013 actuarial valuation, based on GRS's recommendations in their March 29, 2013 Experience Review presentation.

**After reviewing all the materials (see Appendix B of this report) made available, we conclude that the use of 7.00% for this valuation is reasonable.**

*Our rationale for this recommendation is as follows:*

- Based on GRS's March 29, 2013 Experience Review, the average 50<sup>th</sup> percentile of the 30-year expected average geometric net nominal return for eight investment consultants surveyed by GRS is 7.09%.
- Due to the nature of the population of JRS, the duration of the cash-flow is shorter than other retirement systems, supporting a lower interest rate.
- GRS's survey also estimated that the middle 50% of the probable distribution of the System's returns is between 5.23% and 8.97%. This approach satisfies ASOP No. 27.
- GRS's survey also found the average expected nominal return net of expenses for a single year to be 7.83%.

**We recommend that the Board annually review the interest and inflation rate assumptions as opposed to waiting for the completion of a formal Experience Review study (Recommendation #1).**

*Our rationale for this recommendation is as follows:*

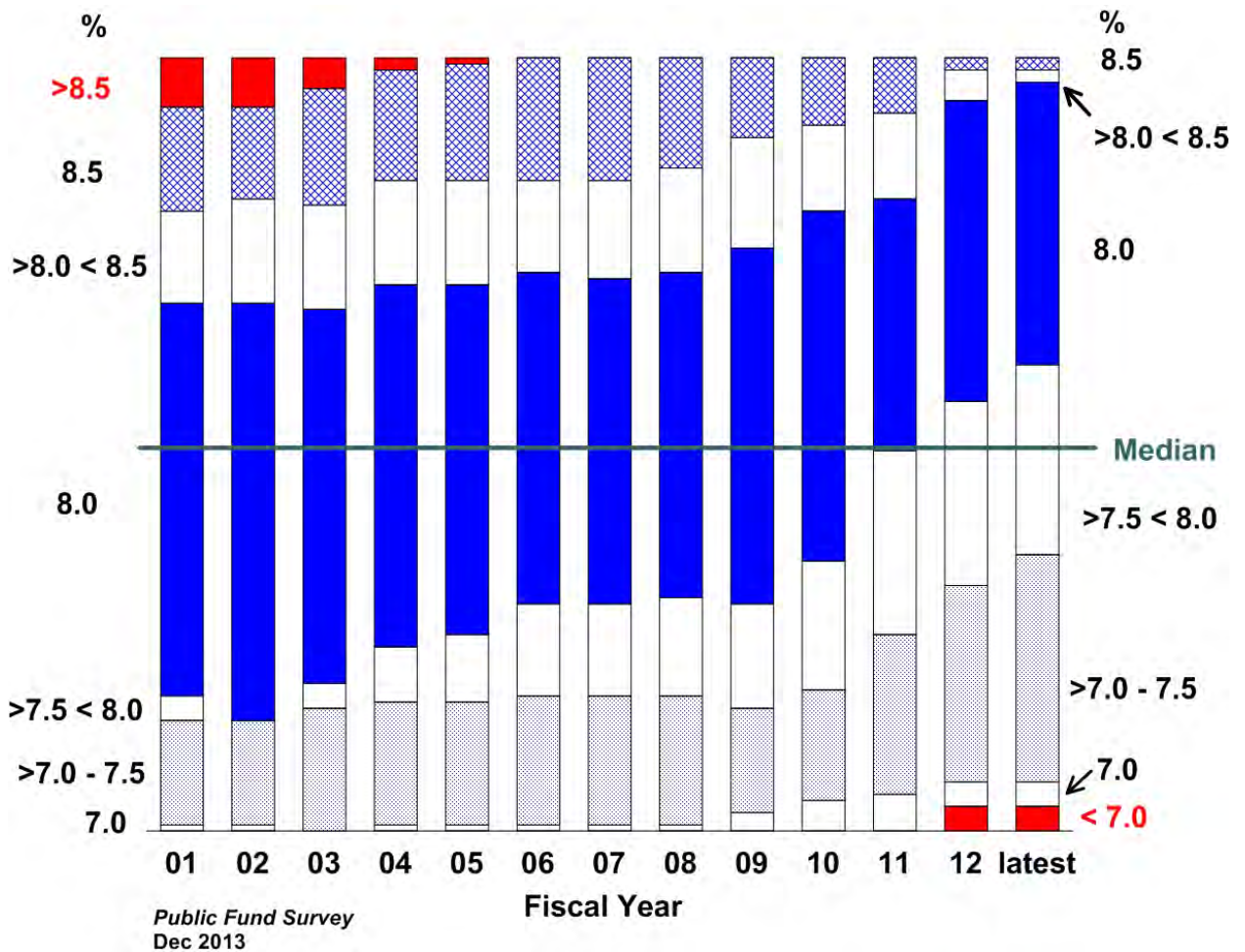
- A review of the interest and inflation rates does not involve the collection of significant data, and can easily be updated annually. In addition, it keeps the Board focused more closely on these critical assumptions.
- We believe that GRS should provide more information to the JRS Board than was provided in their March 2013 study of the investment return. Such information includes: future expectations of the Illinois State Board of Investments (ISBI), an examination of

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industry trends, recent pronouncements of Moody's and other ratings firms, the impact of GASB 67 and 68 on the interest rate, and various activities taking place at US federal agencies and among professional organizations.

- The National Association of State Retirement Administrators (NASRA) conducts an annual survey of public funds. The latest Public Fund Survey covers 126 large retirement plans. The following chart shows the distribution of investment return assumptions for the last 12 years of their survey. The latest data includes results collected through December 2013.

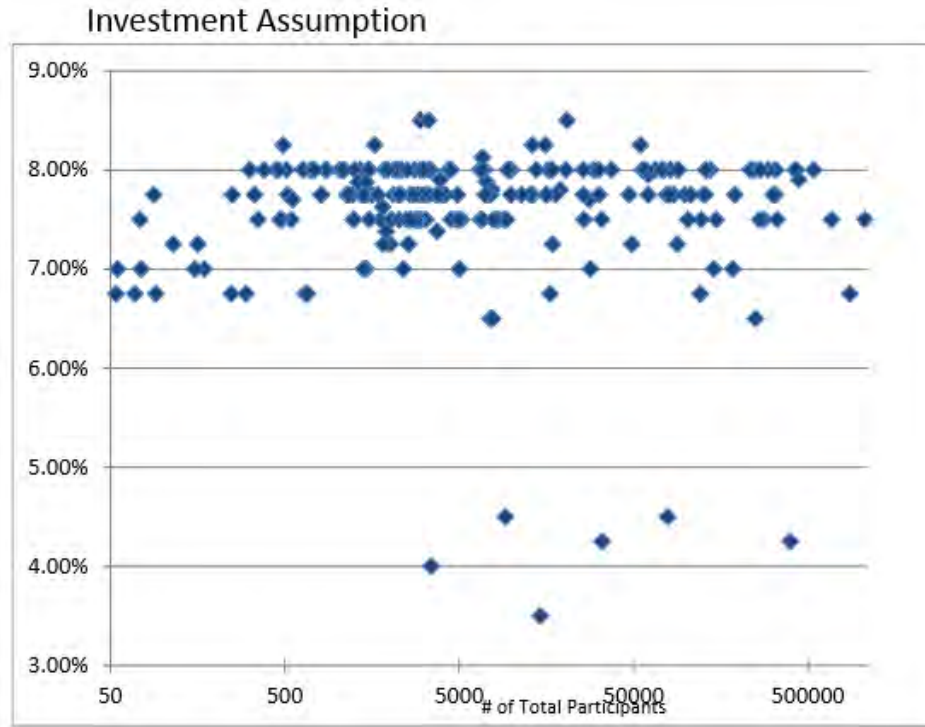


Over the period shown in the latest survey, there continues to be a pattern of reducing investment return assumptions. 42 of the 126 plans have reduced their interest rate assumption since Fiscal Year 2011. Of the nine plans in the survey that indicate an interest rate reduction since Fiscal Year 2012, the median reduction is 0.43%. The survey is consistent with experience of other Cheiron clients, with which there has been a significant trend to reduce the investment return assumptions in the last three years.

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- The following chart from page 11 of the October 2013 *National Conference on Public Employees Retirement Systems (NCPERS) Public Fund Study* shows the rates used nationwide by public sector pension plans.



As part of the study, NCPERS identified that the average investment assumption for the 241 state and local pension plan respondents was 7.6%, and estimating that 40% have reduced this assumption compared to the 2012 study.

- *Pension Industry (actuarial, accounting, legal, and investment professional organizations) pressures may lead to mandated lower interest rates:* In recent years, there has been increased and controversial movement in the actuarial community that actuaries must move away from this traditional theory where the assumed interest assumption is based on expected plan earnings, and instead employ theories espoused by financial economists. Under financial economic theory, the interest rate used to value pension plan liabilities should be based on near risk free rates of return, because pension liabilities (or benefit payments) are considered more akin to bonds, and that using the higher expected earnings rates hides the risks of achieving that return. Near risk-free rates of return today would be less than 4% and would enormously increase the liabilities of JRS, and the resulting required State contribution. While this debate continues and has not been resolved, there are external signs that the public sector may ultimately be forced to utilize much lower investment assumptions.

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- New GASB 67 and 68 pronouncements may subject many public pension plans, such as JRS, to effectively use a lower interest rate for accounting disclosures and pension expense determinations in fiscal years 2014 and 2015, respectively. It is important to note, however, that the new standards do not define funding requirements for a plan.
- Moody's, an organization that provides bond rating information for private investors, has recently announced that they propose to compare the financial viability of public sector pension plans by using, among other things, a 5.67% interest rate assumption.
- The federal government, which promulgates minimum funding standards for corporate pension plans, already requires corporate pension plans to utilize interest rate assumptions based on short-term and mid-term bond rates, which are very low.

2. *Inflation Assumption:*

**We find the inflation assumption of 3.00%, which primarily impacts the salary increase assumption, used in the 2013 actuarial valuation by GRS in certifying the required State contribution is reasonable.**

*Our rationale for concurring with the 3.00% assumption:*

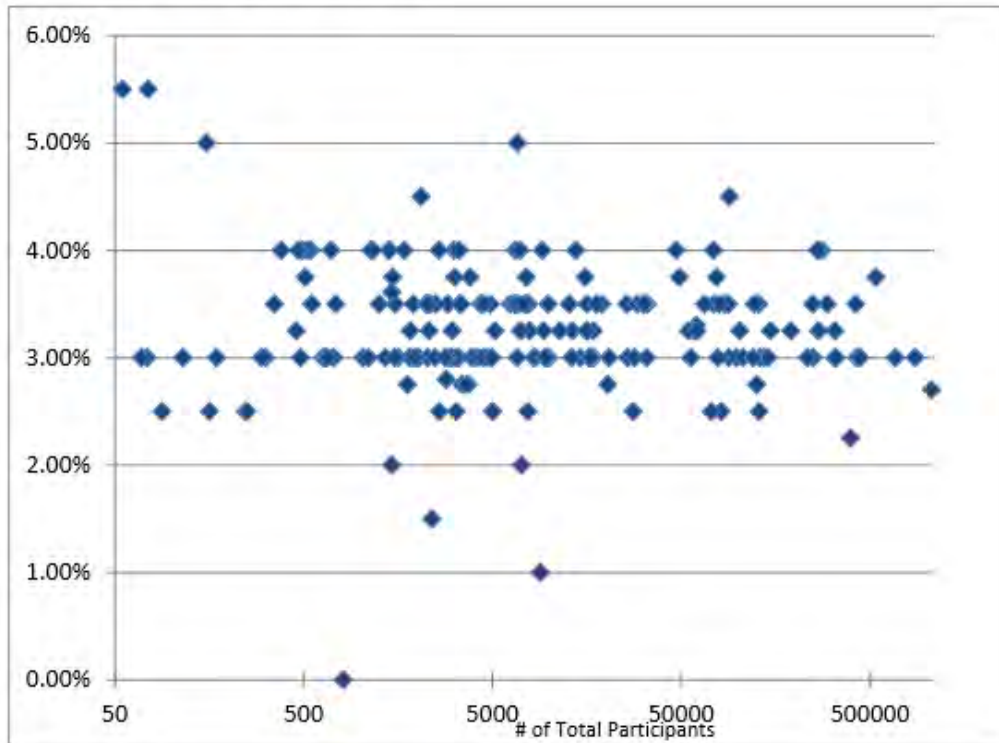
- The 2013 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years), inflation will average somewhere between 1.8% and 3.8%.
- GRS's March 29, 2013 Experience Review presentation shows a range of 2.16% to 3.26% for expectations of future inflation from the eight investment consultants surveyed.
- Our comparison of other public sector retirement systems' inflation assumptions, as shown by surveys published by Boston College's Center of Public Research (CPR), shows that most public sector pension plans utilize an inflation assumption in the range of 2.75% to 3.75%.
- *A National Conference on Public Employee Retirement Systems (NCPERS) 2013 study provides the following graphic of respondents' inflation assumptions:*



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Inflation Assumption



This shows that the 3.0% assumption, which JRS uses, is a prevalent inflation assumption amongst the 241 systems who responded to this study, with 3.3% as the average.

3. *Salary (Annual Compensation) Increase Assumption:*

For the draft June 30, 2013 Actuarial Valuation, the salary scale assumption is 3.75% per year, compounded annually for all active members, regardless of age or service. It includes components of 3.0% per annum for inflation, 0.60% per annum for productivity, and 0.15% for merit/promotion increases.

This assumption was revised for the 2013 valuation from the 4.0% per year assumption used in the 2011 and 2012 valuations.

- **We find the assumption and the basis for setting it reasonable. However, we do recommend that GRS consider whether Tier 2 needs separate assumptions for their salary scale from those developed for Tier 1 to reflect the differences in benefit provisions between the two Tiers (Recommendation #5e).**

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

- GRS's review of the salary history and CPI changes from 2000 to 2012 indicates that the data supports the recommended changes.
- In our own experience with our public sector pension plans (about 60 large plans), we have witnessed a consistent recent trend of declining salary increases for public sector employees.

4. *Other Economic Assumptions:*

**We recommend that GRS disclose the additional economic assumptions that they utilize, including 415(b) limits and 401(a)(17) limits, along with the growth rates for these (Recommendation #5a).**

5. *COLA:*

While Tier 1 members receive an annual automatic COLA, Tier 2 members receive an annual increase of the lesser of the 3% received by Tier 1 and the annual change in the Consumer Price Index for all Urban Consumers. **We recommend GRS disclose their assumed value for the Tier 2 COLA (Recommendation #5a).**

**B. Demographic Assumptions:**

For the June 30, 2013 Actuarial Valuation, GRS has maintained the assumption changes adopted in the June 30, 2011 Actuarial Valuation for retirement and withdrawal, adopted new rates for mortality, and eliminated the disability assumption.

Out of the demographic assumptions, there are four assumptions that are of particular interest.

1. *Mortality:*

For the current valuation, GRS updated the post-retirement mortality table to the RP-2000 Combined Healthy Mortality Table, sex distinct, projected to 2015 (static table), setback three years for males and two years for females. They also updated the pre-retirement mortality to be 85% of the new post-retirement mortality for males and 70% of the new post-retirement mortality for females.

ASOP No. 35 requires that actuaries at least consider projections of mortality improvements, and if there is not such an assumption for improvement, the actuary must disclose the basis for not making the assumption of mortality improvement. With the new table adopted, GRS does project mortality improvement, to 2015. **We recommend using a fully generational mortality table for future valuations. A fully generational mortality table has mortality improvements automatically built-in for new members entering the System, which is**

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**important given that open group projections through 2045 provide the basis for the calculated contribution rates (Recommendation #3).**

2. *Spousal Continuation Election:*

JRS members can elect to have spousal continuation and pay an additional 2.5% of pay for this benefit if they do so. They can also elect not to have a continuation benefit, in which case they do not pay the additional 2.5% contribution. GRS provides no disclosure of their assumptions about the election of this option. This assumption determines the form of benefit assumed elected by members at retirement; however, it was not analyzed or mentioned in the most recent experience study. **We recommend that GRS use actual data that is available rather than an assumption to determine the form of benefit payable at retirement and the amount of contributions payable by active members. We further recommend that GRS provide details regarding the election of this provision by the current inactive members in the Participant Data section (Recommendation #5b).**

GRS needs to add this disclosure as Section 4.1.1. of ASOP No. 35 requires the disclosure of all material assumptions used in the valuation with sufficient detail for another qualified actuary to assess the level and pattern of the rates.

3. *Election of Contribution Discontinuance or Contribution only on Salary Increases Assumption:*

**We recommend GRS make and disclose assumptions relating to the incidence of members electing to either freeze their benefit and discontinue contributions or pay contributions only on salary increases once they are eligible to receive the maximum rate of annuity to satisfy Section 4.1.1. of ASOP No. 35 (Recommendation #5c).**

4. *Termination:*

GRS currently assumes all members have the same termination rates. Illustrative rates of this withdrawal from the System are as follows:

<b>Age Based Termination Rates</b>	
<b>Age</b>	<b>Males</b>
30	0.0128
35	0.0110
40	0.0094
45	0.0076
50	0.0058
55	0.0042
60	0.0024
65	0.0007

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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.

**We recommend that GRS consider using a separate set of termination rates for Tier 2 for the same reasons they found adjusting the retirement rates for Tier 2 necessary, the lower benefits available to Tier 2 members.** This will improve GRS's compliance with the ASOP No. 35 requirement for consistency within assumptions (Recommendation #5e).

**Beginning on the next page, we summarize all remaining demographic assumptions, which we reviewed and concluded are reasonable and meet the requirements of ASOP No. 35, Section 3.3.4.**

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**1. 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. Based on the difference in benefit structures between Tier 1 and Tier 2, different rates are assumed for each Tier.

*Tier 1 Rates:*

<b>Retirement Rates</b>	
<b>Age</b>	<b>Males</b>
60	22.0%
61-70	11.0%
71	12.0%
72	14.0%
73	16.0%
74	18.0%
75-79	20.0%
80	100.0%

<b>Early Retirement Rates</b>	
<b>Age</b>	<b>Males</b>
55	8.0%
56	8.0%
57	8.0%
58	8.0%
59	8.0%

*Tier 2 Rates:*

<b>Retirement Rates</b>	
<b>Age</b>	<b>Males</b>
62	30.0%
63	10.0%
64	13.0%
65	16.0%
66	20.0%
67	30.0%
68	11.0%
69-71	12.0%
72	14.0%
73	16.0%
74	18.0%
75-79	20.0%
80	100.0%

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**2. Disability**

The assumption of disability was removed by GRS for the 2013 valuation, as we had suggested in our 2012 report.

**3. Assets**

Assets available for benefits are used as described on page 41 of the most recent valuation report.

**4. Expenses**

Assumed expenses are estimated and advised by the JRS staff based on current expenses and are expected to increase in relation to the projected capped payroll, at 3.00% per annum.

**5. Spouse's Age**

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

**6. Decrement Timing**

All decrements are assumed to occur beginning of year.

**7. Decrement Relativity**

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

**8. Decrement Operation**

Turnover decrements do not operate after member reaches retirement eligibility.

**9. Eligibility Testing**

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

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**ASSUMPTIONS AS A RESULT OF PUBLIC ACT 96-0889**

Members hired after December 31, 2010 are assumed to contribute 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. We recommend that GRS consider providing additional clarity in their report as to the definitions of the various salary terms and values provided.

Retirement rates are also adjusted for Tier 2 members, as detailed previously.

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**C. 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). Since the amortization basis is governed by State law, we do not comment on it here.

*1. Cost Method:*

The System uses the projected unit credit (PUC) cost method to assign costs to years of service, as required to 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 Public Act 094-0004's requirement 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 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 value increasing, while the PUC method is not an unreasonable method, more plans use the Entry Age Normal (EAN) funding method to mitigate this affect. It should also be noted that the EAN method will be the required method to calculate liability for GASB 67 & GASB 68.

*2. Asset Smoothing 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 that fluctuations in the AVA will be less volatile over time than fluctuations in the market value of assets. **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.**

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 (IRS) mandates this "corridor" for private sector pension plans (a 90%-110% corridor is mandated). Even though it is not mandated for public plans, we believe that the use of this type of corridor is a much sounder actuarial practice, and according to ASOP No. 44 in



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Section 3.3 b 1, the actuarial value of assets should "...fall within a reasonable range around the corresponding market value." **Therefore, we recommend that the JRS Board consider moving to this approach in future valuations.** It is important to note that currently a move to this corridor approach would have no impact on the 2013 actuarial valuation results, as the actuarial value of assets is already within the 80%-120% corridor (Recommendation #2).

**D. Determination of the Required State Contribution:**

As required by Public Act 94-0004, in determining the required State contribution under State law, the actuary must determine what level of future contributions is needed to make a projection of the System's funded status in 2045 be at 90%. To make that determination, the actuary needs to make an assumption regarding the age/sex/salaries of new hires that replace existing members leaving over this period. This assumption is commonly referred to as the "New Entrant Profile." In addition to making that assumption, the actuary needs to apply actuarial methodologies to project the June 30, 2013 valuation into the future.

The "New Entrant Profile" assumption is a critical assumption as the required projection of 90% funding in the year 2045 means that the majority of active members will be new hires after the current June 30, 2013 valuation. **Therefore, we recommend that GRS disclose additional information in their valuation report as to how the New Entrant Profile, which is shown on page 36 of their June 30, 2013 Actuarial Valuation Report, was developed. In addition, we recommend GRS include all relevant information regarding the New Entrant Profile in the valuation report in order to better comply with ASOP No. 41 dealing with actuarial communications** (Recommendation #4).

**We also recommend that GRS disclose in future valuations additional items needed to perform a more comprehensive analysis of GRS's determination of the System's funded status in 2045** (Recommendation #6). The specific additional items still needed are outlined in Section II: Proposed Certification of the Required State Contribution. We believe these would be appropriate disclosures under ASOP No. 41 and that the additional information will allow us to perform a more comprehensive analysis of GRS's determination of the required State contribution. We finally recommend that GRS include the historic development of assets without General Obligation Bonds.

**E. Other Issues:**

*1. State Mandated Funding Method:*

In its valuation report on pages 12-13, GRS offers commentary on the Statutory funding method from an actuarial point of view. They describe the Annual Required Contribution (ARC) under GASB 25 and 27 as a method designed to finance benefits for current participants to a 100% funding target over a projected period not to exceed 30 years often used as a de facto funding method. They contrast the ARC funding method with the current Statutory method and note that the Statutory policy produces a back-loaded contribution

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projection, significantly deferring contributions into the future. They also provide a chart that shows the projected funding ratio. As of the valuation year ending June 30, 2013, the System is just under 30% funded. The funded ratio is projected to be under 50% until 2035, at which point there is a steep increase in the funded ratio from 2035 to 2045.

GRS advises “strengthening the current statutory funding policy”, and provides the following examples:

- a. Reducing the projection period needed to reach 90 percent funding;
- b. Increasing the 90 percent funding target;
- c. Separating the financing of benefits for members hired before and after December 31, 2010; and
- d. Changing to an ARC based funding approach with an appropriate amortization policy for each respective Tiered benefit structure.

Illinois Pension Code (40 ILCS 5/18-131) is limited in meeting the risks of the System. This law requires that the actuary base the required contribution using a prescribed funding method that achieves a 90% funding in the year 2045.

**We concur with the GRS recommendations to increase the 90% funding target and to reduce the projection period, in accordance with generally accepted actuarial practices. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of JRS.**

It may be illustrative to include a comparison of the projected contributions and funded ratios under some combination of the items above as well.

**We suggest due to the systematic underfunding of the System that the JRS Board always use the conservative end of any range of assumptions recommended by GRS. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn (Recommendation #7).**

2. *State Mandated Projection Method:*

Under Public Act 96-0043, the actuarial methodologies utilized in performing the 2045 projection of the System's funded status assume the application of the future earnings rate (currently at 7.00%) to the AVA rather than the MVA. GRS included an illustration of projected AVA with a phase in of the asset smoothing method gains and losses. **We agree that this approach provides a more realistic expectation of the future direction of the contribution level. We have similar concerns over the implications of the law under the Act.**

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The table below demonstrates what the market value would have to earn in order for the actuarial value to earn 7.00% based on the ratio of actuarial value to market value. We recommend consideration of requiring the basis of the projected future earnings of the System be starting market values of assets (rather than smoothed values).

**What the market value of assets (MVA) would need to earn in a given year, if the actuarial value of assets (AVA) are assumed to earn 7.00%, at various ratios of**

<u>Ratio of AVA to MVA</u>	<u>Required MVA Return</u>
130.00%	77.50%
125.00%	65.75%
120.00%	54.00%
115.00%	42.25%
110.00%	30.50%
105.00%	18.75%
100.00%	7.00%
95.00%	-4.75%
90.00%	-16.50%
85.00%	-28.25%
80.00%	-40.00%
75.00%	-51.75%
70.00%	-63.50%

*3. Payrolls used in Valuation:*

Contributions for Tier 2 are based on capped payroll while those for Tier 1 are uncapped. GRS uses a number of phrases throughout their report relating to the payroll, such as “projected annualized payroll”, “covered payroll”, and “capped payroll” without making the definition of these terms clear. **We recommend that GRS provide additional clarity on the payrolls used in their valuation throughout their report** (Recommendation #5d). In addition to adding more exposition to the narrative, they can better achieve this goal by adding additional clarity in the sections on Participant Data, Actuarial Methods and Assumptions, and Plan Provisions.

**F. Preparations for GASB 67 & 68:**

The Governmental Accounting Standards Board (GASB) adopted Statement No. 67 (GASB 67) **Financial Reporting for Pension Plans—an amendment of GASB Statement No. 25** and Statement No. 68 (GASB 68) **Accounting and Financial Reporting for Pensions—an amendment of GASB Statement No. 27**. GASB 67 is effective for periods beginning after

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June 15, 2013 and GASB 68 is effective for fiscal years beginning after June 15, 2014. The following is a brief summary of some of the changes contained in these statements:

- The Total Pension Liability will be calculated using the individual entry age actuarial cost method.
- A new blended interest rate assumption will be based on (1) a long-term expected rate of return on pension plan investments to the extent that assets are projected to be sufficient to pay benefits based on future contributions intended to finance current member benefits (i.e., excluding normal cost contributions for new entrants) and (2) a tax-exempt, high-quality municipal bond rate to the extent that the conditions for use of the long-term expected rate of return are not met. This will likely mean the interest rate will be reduced if projected contributions plus assets are not able to cover projected pension benefits.
- The Unfunded Actuarial Liability, now called Net Pension Liability, will be calculated using the market value of assets instead of the smoothed actuarial value of assets.
- The entire Net Pension Liability will be recognized immediately on the employer's statement of net position.
- The Annual Required Contribution (ARC) has been eliminated. The new Pension Expense equals: Normal Cost + Interest Cost - Expected Asset Earnings + Amortization of changes in total pension liability +/- five-year differences on the actual vs. expected asset returns.
- Recognition periods of unexpected changes in net pension liability would vary depending upon the source for the change. These periods would be immediate for plan changes, five years for the difference between projected and actual investment earnings, and expected working lifetime of both active and inactive members for other total pension liability changes.

We have reviewed the System's strategy for implementing GASB 67 and 68 and summarized below.

**1. The implementation, reporting, measurement and valuation dates for GASB 67 and 68**

- JRS will implement GASB 67 for their Fiscal Year 2014 (July 1, 2013 – June 30, 2014) Comprehensive Annual Financial Report.
- JRS did not specify a date planned to implement GASB 68.
- JRS has not determined the valuation date for GASB 67 & GASB 68.

**2. The method that will be used to develop the annual financial reporting**

JRS plans to reach out to their actuaries for further guidance but at this point has not determined the method that will be used.

**3. The projected "crossover" date (date of asset depletion) if any**

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JRS plans to reach out to their actuaries for further guidance but at this point has not determined a crossover date.

**4. The bond index that will be used to develop the interest rate for the period after the crossover date**

JRS plans to reach out to their actuaries for further guidance but at this point has not determined the bond index that will be used.

**5. The projected blended interest rate used for developing Net Pension Liability (NPL)**

JRS plans to reach out to their actuaries for further guidance but at this point has not estimated a projected blended interest rate.

**6. Expected allocation method of NPL among employers if cost sharing plan**

JRS plans to reach out to their actuaries for further guidance but at this point has not determined an allocation method.

**7. Any unresolved issues concerning the implementation of either GASB 67 or 68**

Significant additional planning will be required of JRS prior to implementation GASB 67 and GASB 68.

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

**Response to recommendations in 2012:**

In the State Actuary's Preliminary Report on the Judges' Retirement System of Illinois presented December 10, 2012, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in this year's valuation report.

<b>Judges' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
<b><i>Recommended Changes to Actuarial Assumptions Used in the 2012 Valuation</i></b>		
Cheiron concluded the assumptions were reasonable and had no recommended changes to the assumptions.		
<b><i>Recommended Additional Disclosures for the 2012 Valuation:</i></b>		
1. We recommend GRS disclose in their June 30, 2012 report a complete description as to how the New Entrant Profile assumption was developed.	Partially Implemented	Limited explanation provided on page 36 of the 2013 valuation, but additional detail sufficient for another qualified actuary to review the development methodology is necessary.  Additional information regarding genders within the New Entrant Profile is needed since sex distinct mortality is used beginning with the 2013 valuation.  <b>Recommendation repeated and expanded.</b>
<b><i>Recommended Changes for Future Valuations:</i></b>		
1. We recommend GRS consider, in future valuations, establishing a corridor around the market value of assets of 80% to 120%, beyond which the actuarial value of assets is limited given the use of the actuarial value of assets in the projection methodology in accordance with the statutory funding method.	Not Implemented	This has not been addressed in the 2013 valuation.  <b>Recommendation repeated.</b>
2. We recommend that GRS consider using a fully generational mortality table so that future mortality improvements will continue	Partially Implemented	Projected to 2015, but not fully generational.

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

<b>Judges' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
to impact new entrants throughout the projection period ending in 2045.		<b>Recommendation repeated.</b>
3. We recommend that GRS consider using the actual data available rather than an assumption for determining if a member will choose a benefit option that provides a survivor annuity.	Partially Implemented	Noted on page 2 of GRS's 2013 draft valuation that the current assumption will be maintained.  If GRS does continue using the assumption, we recommend they provide additional detail in their valuation report to allow another qualified actuary to examine the employee contribution rates produced in the projection tables and assess their consistency with GRS's contribution assumptions.  <b>Recommendation repeated.</b>
4. We recommend that GRS consider eliminating the disability assumption since there is very little incidence of disability, there is no distinct disabled mortality table being used, and there is no distinction in the retiree data between healthy and disabled annuitants.	Implemented	Was eliminated beginning with the 2013 valuation.
<b><i>Proposed Certification of the Required State Contribution:</i></b>		
1. We recommend that GRS disclose in the June 30, 2013 and later valuations the following items in order for us to continue to perform an analysis of the required State contribution in the future:		
<ul style="list-style-type: none"> <li>• Projections by year of future benefit payouts split by actives and current inactive (i.e. retirees, survivors, disabled, and deferred vested);</li> </ul>	Partially Implemented	The versions of Table 4 continue to only provide an aggregate number, including expenses.  <b>Recommendation repeated.</b>
<ul style="list-style-type: none"> <li>• The present value of future benefits by year for actives, terminated vested,</li> </ul>	Implemented	This has been addressed in Table 8 of

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

<b>Judges' Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
retirees and beneficiaries, and disabled members;		the 2013 valuation.
<ul style="list-style-type: none"> <li>• A historic development of assets without General Obligation Bonds.</li> </ul>	Not Implemented	<p>Significant questions remain on the projections that are fundamental to the development of the Required State Contributions.</p> <p><b>Recommendation repeated.</b></p>
2. All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.	Partially Implemented	<p>This has been addressed in Tables 7-9 of the 2013 valuation, but the various versions of Table 4 do not split the projected benefit payouts into these three distinct groups.</p> <p><b>Recommendation repeated.</b></p>



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**Chapter Six**

**PRELIMINARY REPORT ON THE  
GENERAL ASSEMBLY  
RETIREMENT SYSTEM**

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In accordance with Public Act 097-0694, Cheiron, the State Actuary, submitted a preliminary report to the Board of Trustees of the General Assembly Retirement System (GARS) concerning proposed certifications of required State contributions submitted to Cheiron by the Board. The preliminary report was submitted to GARS on December 4, 2013. The preliminary report was based on Cheiron's review of actuarial assumptions included in GARS' 2013 Actuarial Valuation.

Following is Cheiron's final preliminary report on the General Assembly Retirement System. GARS' written response, provided on December 16, 2013, can be found in Appendix C.



December 19, 2013

Mr. William G. Holland  
Auditor General  
740 East Ash Street  
Springfield, Illinois 62703

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

Dear Ladies and Gentlemen:

In accordance with Public Act 097-0694 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) for Fiscal Year 2015. This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices, which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**In summary, our review of the assumptions and methods used in the June 30, 2013 Actuarial Valuation, which were used to determine the required Fiscal Year 2015 State contribution, found that the assumptions were reasonable both individually and in the aggregate.** However, we have some recommended changes for the Board to consider for future valuations. Details on recommendations can be found in the report that follows. Please provide written responses to our recommendations by the close of business on December 16, 2013.

Section I of this report describes the review process undertaken by Cheiron. Section II summarizes our findings. 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' actuarial certification, as well as our assessment of the GRS determination of the required State Contribution for Fiscal Year 2015. Finally, in Section III we comment on other issues impacting the funding of GARS, including the implications of Article 2 of the Illinois Pension Code, which establishes the statutory funding requirements for the System. **In our opinion, the statutory mandated minimum funding requirements call for inadequate funding, and do not meet generally accepted actuarial standards of practice.**




In preparing this report, we relied on information (some oral and some written) supplied by GARS, GRS, and Goldstein & Associates. This information includes actuarial assumptions and methods adopted by the GARS Board, System provisions, summarized census data, the draft 2013 Actuarial Valuation Report, and the formal Experience Review, which includes a review of the investment return assumption. A detailed description of all information provided for this review is contained in the body of our report.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

Sincerely,  
Cheiron



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



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

**THE STATE ACTUARY'S PRELIMINARY REPORT ON THE  
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**SECTION I - REPORT SCOPE**

Under Illinois Public Act 097-0694 (the Act) Cheiron, as the State Actuary, is required to review the actuarial assumptions and valuation of the General Assembly Retirement System of Illinois (GARS) and issue this preliminary report to the GARS Board, on the proposed certification prepared by Gabriel Roeder Smith & Company (GRS) of the required State contributions for Fiscal Year (FY) 2015. The purpose of this review is to identify any recommended changes to the actuarial assumptions for the GARS Board to consider before GRS, the GARS actuary, finalizes their certification of the required State contributions to the GARS for FY 2015. In accordance with the Act, our review did not include a replication of the actuarial valuation results.

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 addition to the information reviewed for our 2012 review, we also reviewed the draft June 30, 2013 Actuarial Valuation Report and April 2013 Experience Review prepared by GRS. The materials we reviewed are listed in Appendix B.

Finally, 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, consistent with our initial report, we continue to interpret actuarial practices to mean: (1) does the GARS Board utilize a qualified actuary to prepare the annual actuarial valuation which determines the required State contribution; and (2) does the GARS Board require the GARS actuary to conduct 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 June 30, 2013 actuarial valuation. Future reports may examine additional actuarial practices of the GARS Board.

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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, 2013 Actuarial Valuation Report of GARS. Detailed analysis and rationale for these recommendations can be found in Section III of this report.

**Assessment of Actuarial Assumptions Used in the 2013 Valuation:**

Public Act 097-0694 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 2013 GARS Actuarial Valuation Report and conclude that they are reasonable. Consequently, we do not have any recommended changes for the 2013 actuarial valuation.

**Recommended Changes for Future Valuations:**

- 1) We recommend again, as we did last year, that GRS consider in future valuations establishing a corridor around the market value of assets of 80% to 120%, beyond which the actuarial value is limited given the use of the actuarial value of assets in the projection methodology in accordance with Public Act 96-0043. While this change would have no impact on the System for the June 30, 2013 valuation, we believe it would be better to establish this corridor before it is actually applicable.
- 2) We recommend again, as we did last year, that GRS consider using a fully generational mortality table so that future mortality improvements will continue to impact new entrants throughout the projection period ending in 2045.
- 3) While we found the economic assumptions to be reasonable this year, we recommend that the GARS Board annually review the economic assumptions (interest rate and inflation) prior to commencing the valuation work, and adjust assumptions accordingly.
- 4) We recommend again, as we did last year, that GRS include all relevant information regarding the New Entrant Profile in the valuation report in order to better comply with ASOP No. 41 dealing with actuarial communications.
- 5) We have several minor recommendations to future reports:
  - a. We recommend that GRS disclose the additional economic assumptions that they utilize in their actuarial valuation, including 415(b) limits, 401(a)(17) limits, and the COLA for Tier 2, along with the growth rates for these.
  - b. We recommend that GRS consider using the actual data available rather than an assumption for determining if a member will choose the spousal continuance benefit option that provides a survivor annuity. We further recommend that GRS provide details regarding the election of this provision by the current inactive members in the Participant Data section.

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**SECTION II - SUMMARY OF RECOMMENDATIONS**

- c. We recommend that GRS provide additional clarity on the payrolls used in their valuation throughout their report to allow for a more complete evaluation by another qualified actuary as required by actuarial standards of practice.
- d. We recommend that GRS consider whether additional revisions to the demographic assumptions for Tier 2 are appropriate to their benefit structure and consistent with the revised retirement rates already implemented.

**Proposed Certification of the Required State Contribution:**

- 6) GRS has determined that the FY 2015 required State contribution calculated under the current statutory funding plan is \$15,809,000. We have verified the arithmetic calculations made by GRS to develop this required State contribution and reviewed the assumptions on which it is based. In verifying these calculations, we have accepted GRS's annual projections of future payroll, total normal costs, employee contributions, combined benefit payments and expenses, and total contributions. We recommend that GRS continue to disclose the above items in future valuations in order for us to continue to perform an analysis of the required State contribution.
  - We again recommend that GRS provide the projections by year of future benefit payouts split by actives and current inactives, separate from expenses, instead of the aggregate number, including expenses, that they provided for 2013. In addition, we would also request again, as we did last year, that GRS include the historic development of assets without the General Obligation Bonds (GOB).
  - All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.

**State Mandated Funding Method**

- 7) The current statutory funding plan calculates the minimum contribution to GARS for each fiscal year as the amount sufficient to cause the total assets of the System to equal 90% of the total liabilities of the System by the end of Fiscal Year 2045. **This funding method does not meet actuarial standards of practice because the System is not funded to 100% and the funding of the plan is pushed back to later years. At a minimum, future plan benefit accruals should be fully funded to avoid systematic underfunding of GARS.**

Also, based on the 2013 draft Actuarial Valuation Report, the funded ratio is only 16.2% based on the actuarial value of assets as a ratio over the actuarial liability and is expected to drop below 5% by 2028 assuming all assumptions are realized. We have concerns about the solvency of the System if there is a market downturn. **We suggest due to the systematic underfunding of the System that the GARS Board always use the conservative end of any range of assumptions recommended by GRS. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.**

### 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.

#### **A. Economic Assumptions**

##### *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 changed to 7.00% from 8.00% for the June 30, 2011 actuarial valuation in response to the Investment Return Assumption study letter dated October 6, 2010 prepared by Goldstein and Associates.

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

*Our rationale for concurring with this assumption is as follows:*

- Goldstein and Associates and GRS adhered to Actuarial Standards of Practice (ASOP No. 27) in developing the interest rate assumption based on underlying capital market assumptions provided by independent investment consultants in Goldstein and Associates Investment Return Assumption study letter and GRS' 2013 Experience Review.
- Based on GRS's March 29, 2013 Experience Review, the average 50<sup>th</sup> percentile of the 30-year expected average geometric net nominal return for eight investment consultants surveyed by GRS is 7.09%.

**We recommend that the Board annually review the interest and inflation rate assumptions as opposed to waiting for the completion of a formal Experience Review study (Recommendation #3).**

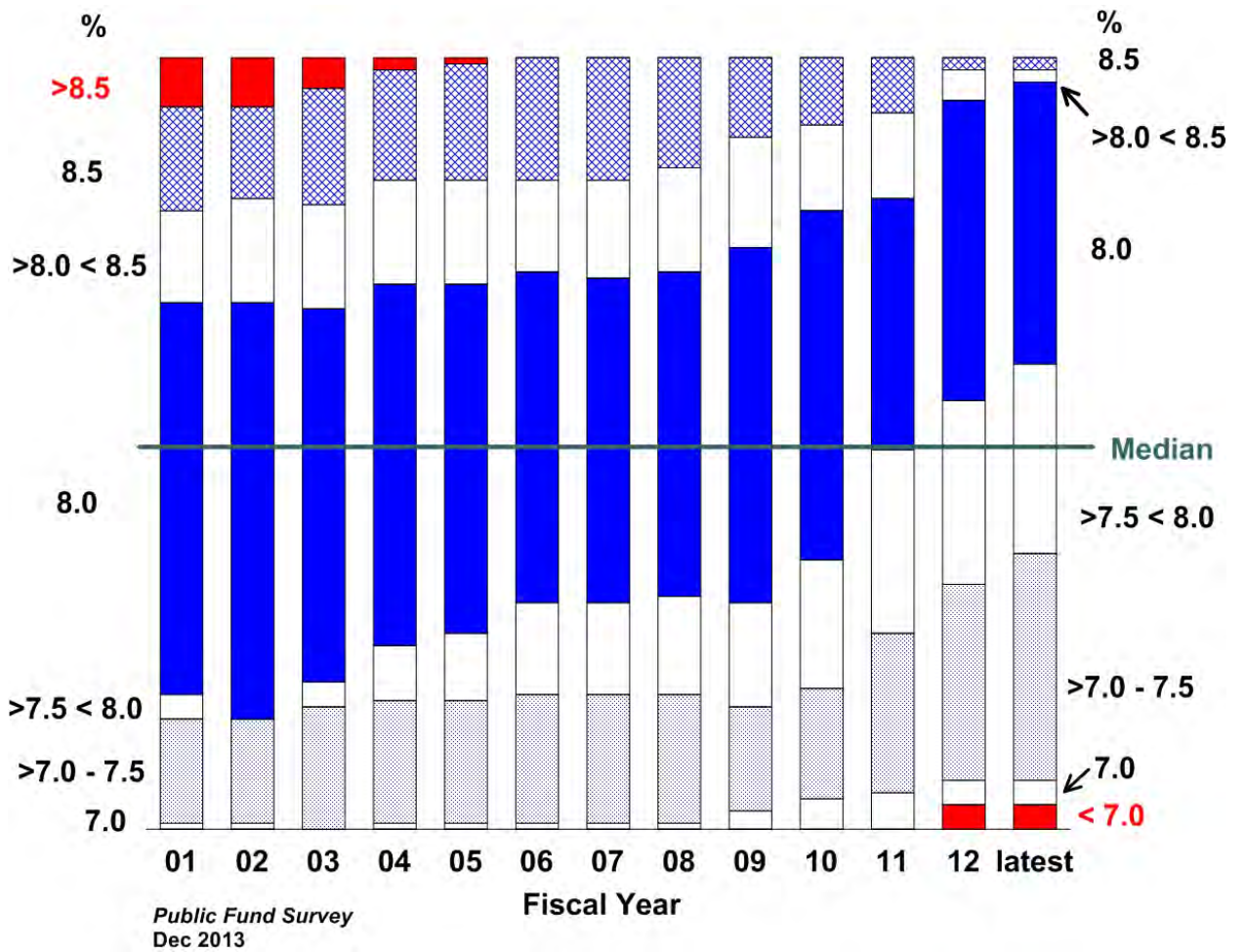
*Our rationale for this recommendation is as follows:*

- GRS, in their June 30, 2013 draft valuation, is reporting a funded ratio (actuarial value of assets over actuarial liabilities) of 16.2%, which in our opinion is at dangerously low levels for a retirement plan. Even though a more realistic assumption would drop that ratio below 15%, it would also require expedited funding of the System going forward.
- The National Association of State Retirement Administrators (NASRA) conducts an annual survey of public funds. The latest Public Fund Survey covers 126 large retirement plans. The following chart shows the distribution of investment return assumptions for the last 12 years of their survey. The latest data includes results collected through December 2013.



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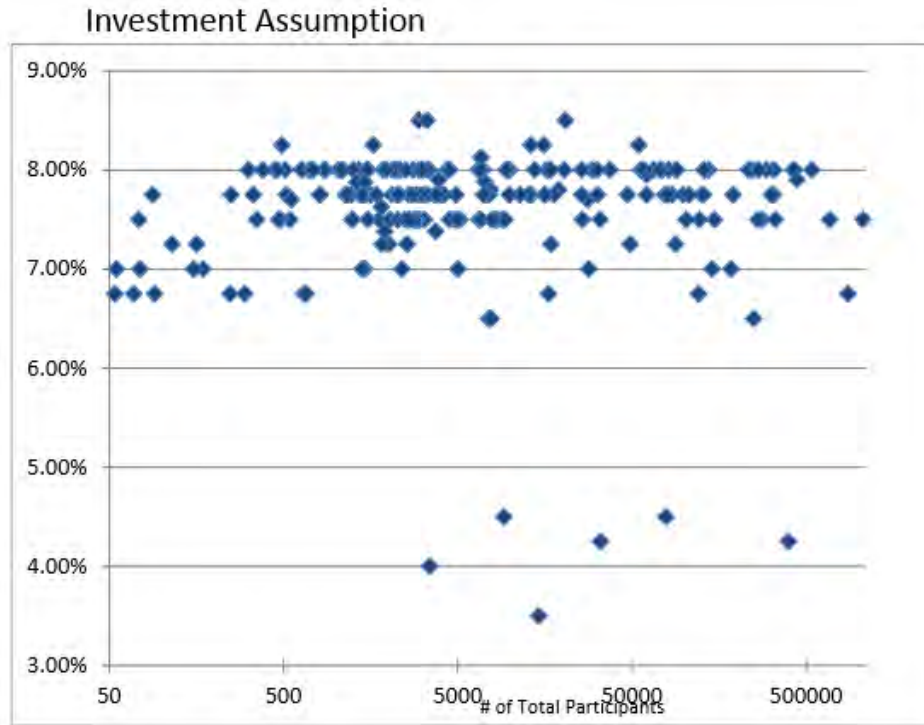


Over the period shown in the latest survey, there continues to be a pattern of reducing investment return assumptions. 42 of the 126 plans have reduced the interest rate assumption since the Fiscal Year 2011. Of the nine plans in the survey that indicate an interest rate reduction since Fiscal Year 2012, the median reduction is 0.43%. The survey is consistent with experience of other Cheiron clients, with which there has been a significant trend to reduce the investment return assumptions in the last three years.

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- The following chart from page 11 of the October 2013 *National Conference on Public Employees Retirement Systems (NCPERS) Public Fund Study* shows the rates used nationwide by public sector pension plans.



As part of the study, NCPERS identified that the average investment assumption for the 241 state and local pension plan respondents was 7.6%, and estimating that 40% have reduced this assumption compared to the 2012 study.

- *Pension Industry (actuarial, accounting, legal, and investment professional organizations) pressures may lead to mandated lower interest rates:* In recent years, there has been increased and controversial movement in the actuarial community that actuaries must move away from this traditional theory where the assumed interest assumption is based on expected plan earnings, and instead employ theories espoused by financial economists. Under financial economic theory, the interest rate used to value pension plan liabilities should be based on near risk free rates of return, because pension liabilities (or benefit payments) are considered more akin to bonds, and that using the higher expected earnings rates hides the risks of achieving that return. Near risk free rates of return today would be less than 4% and would enormously increase the liabilities of GARS, and the resulting required State contribution. While this debate continues and has not been resolved, there are external signs that the public sector may ultimately be forced to utilize much lower investment assumptions.
- New GASB 67 and 68 pronouncements may subject many public pension plans, such as GARS, to effectively use a lower interest rate for accounting disclosures and pension

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expense determinations in fiscal years 2014 and 2015, respectively. It's important to note, however, that the new standards do not define funding requirements for a plan.

- Moody's, an organization that provides bond rating information for private investors, has recently announced that they propose to compare the financial viability of public sector pension plans by using, among other things, a 5.67% interest rate assumption.
- The federal government, which promulgates minimum funding standards for corporate pension plans, already requires corporate pension plans to utilize interest rate assumptions that are based on short-term and mid-term bond rates, which are very low.

2. *Inflation Assumption:*

**We find the inflation assumption of 3.00%, which primarily impacts the salary increase assumption, used in the 2013 actuarial valuation by GRS in certifying the required state contribution is reasonable.**

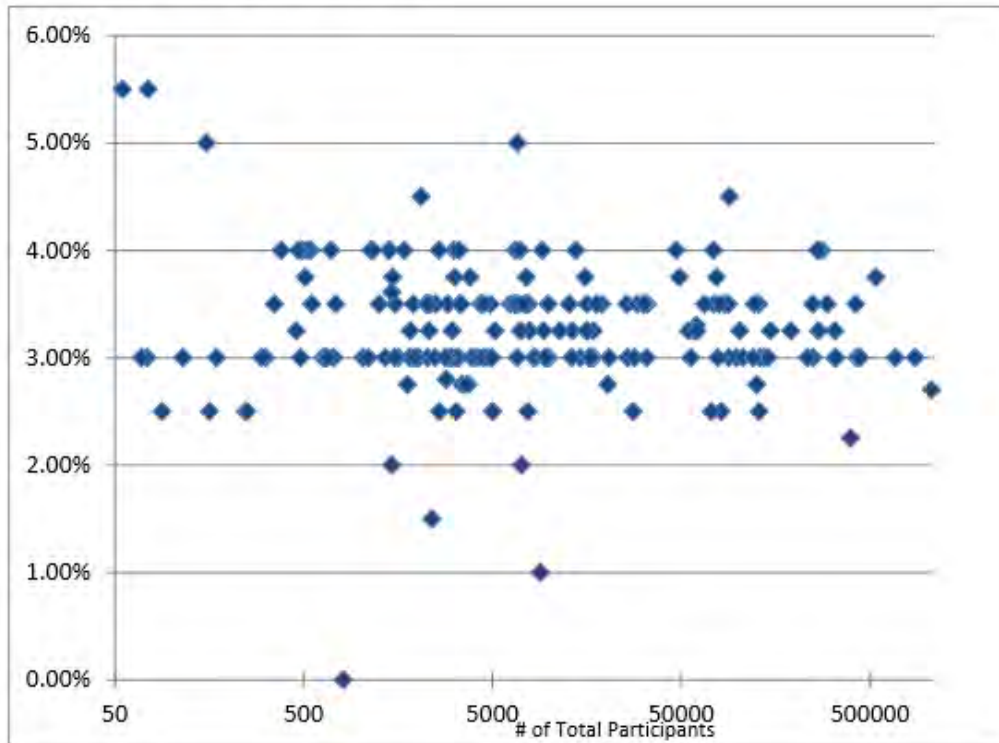
*Our rationale for concurring with the 3.00% assumption:*

- The 2013 Old-Age, Survivors, and Disability Insurance Trustees Report projects that over the long-term (next 75 years) inflation will average somewhere between 1.8% and 3.8%.
- GRS' 2013 Experience Review shows a range of 2.16% to 3.26% for expectations of future inflation from the eight investment consultants surveyed.
- Our comparison of other public sector retirement systems' inflation assumption, as shown by surveys published by Boston College's Center of Public Research (CPR), shows that most public sector pension plans utilize an inflation assumption in the range of 2.75% to 3.75%.
- *A National Conference on Public Employee Retirement Systems (NCPERS) 2013 study, provides the following graphic of respondents' inflation assumption:*

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Inflation Assumption



This shows that the 3.0% assumption, which the GARS uses, is a prevalent inflation assumption amongst the 241 systems who responded to this study, with 3.3% as the average.

3. *Salary (Annual Compensation) Increase Assumption:*

For the draft June 30, 2013 actuarial valuation, the salary scale assumption was lowered from 4.0% per year to 3.5% per year, compounded annually for all active members regardless of age or service. It includes components for inflation of 3.0% per annum, productivity of .40% per annum and merit/promotion of .10% per annum. In addition, salaries are assumed to remain at their current levels for fiscal years 2014 and 2015.

**We find the assumption and the basis for setting it as reasonable.**

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

- The salary increase assumption was based on GRS' review of the report issued by the Legislative Research Unit regarding the history of Illinois Legislator's compensation where the average salary increase from 1991 to 2012 averaged 2.90% per year.
- In our own experience with our public sector pension plans (about 60 large plans), we have witnessed a consistent recent trend of declining salary increases for public sector

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employees which was addressed when the assumption was changed effective for the June 30, 2011 valuation.

*4. Other economic assumptions:*

**We recommend that GRS disclose the additional economic assumptions that they utilize, including 415(b) limits, 401(a)(17) limits, and the COLA for Tier 2, along with the growth rates for these (Recommendation #5a).**

**B. Demographic Assumptions**

The June 30, 2013 actuarial valuation was based on the 2013 Experience Review. Based on that review, the mortality, disability and salary increase for inactive participants were modified.

*1. Mortality:*

For post-retirement mortality, the RP-2000 Combined Healthy Mortality Table, sex distinct, projected to 2015 (static table) setback 3 years for males and 2 years for females. The mortality table used is a static table with the provision for future mortality improvement in the projection to 2015 which is in sync with the next scheduled experience study.

Pre-retirement mortality is based on a percentage of 85% for males and 70% for females of post-retirement mortality.

**However, we recommend using a fully generational mortality table. A fully generational mortality table has mortality improvements automatically built-in for new members entering the plan, which is important given that open group projections through 2045 provide the basis for the calculated contribution rates (Recommendation #2).**

*2. Disability Incidence:*

Our 2012 report recommended that GRS consider eliminating disability rates. GRS reviewed this assumption in their 2013 Experience Review and effective with the 2013 valuation eliminated disability rates. We find this change to be reasonable.

*3. Salary Increases for Inactive Participants:*

In the actuarial reports for years 2006 through 2011 (Goldstein and Associates) that we reviewed, there was a consistent actuarial liability loss item every year for "salary increases of inactive members who are participants in other Illinois public retirement systems." These liability losses totaled \$14.2 million over this six year period. We recommended in our 2012 report that GRS analyze this liability. GRS reviewed this in their 2013 Experience Review

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and found that the liability for inactives has increased 9.3% over the last 6 years. Effective with the 2013 valuation, GRS has applied a 10% load on inactive vested liabilities to account for future pay increases for inactive members. We find this assumption to be reasonable.

There are two additional assumptions which GRS should review:

- **Consider using the actual data available rather than an assumption for determining if a member will choose the spousal continuance benefit option that provides a survivor annuity. We further recommend that GRS provide details regarding the election of this provision by the current inactive members in the Participant Data section (Recommendation #5b).**
- **Consider whether additional revisions to the demographic assumptions for Tier 2 are appropriate to their benefit structure and consistent with the revised retirement rates already implemented (Recommendation #5d).**

**Beginning on the next page, we summarize all remaining demographic assumptions, which we reviewed and concluded are reasonable and meet the requirements of ASOP No. 35, section 3.3.4.**

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**1. Marriage Assumption**

75.0% of active and retired participants are assumed to be married.

**2. Termination**

Rates of withdrawal are assumed to be equal to 4.0% for all ages 20 through 65.

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.

**3. 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.

<b>Retirement Rates</b>	
<b>Age</b>	<b>Males</b>
55	10.00%
56-79	8.50%
80	100.00%

**4. Assets**

Assets available for benefits are used as described on page 40 of the most recent valuation report.

**5. Expenses**

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

**6. Spouse's Age**

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

**7. Decrement Timing**

All decrements are assumed to occur at the beginning of the year.

**8. Decrement Relativity**

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Decrement rates are used directly from the Experience Study without adjustment for multiple decrement table effects.

**9. Decrement Operation**

Turnover decrements do not operate after member reaches retirement eligibility.

**10. Eligibility Testing**

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

**ASSUMPTIONS AS A RESULT OF PUBLIC ACT 96-0889**

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

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

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

<b>Retirement Rates</b>	
<b>Age</b>	<b>Males</b>
62	40.00%
63	15.00%
64	20.00%
65	25.00%
66	30.00%
67	40.00%
68-79	5.00%
80	100.00%



### SECTION III - SUPPORTING ANALYSIS

#### C. 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. Since the amortization basis is governed by State law, we do not comment on it here.

##### *1. Cost Method:*

The System uses the projected unit credit cost method (PUC) to assign costs to years of service, and is required to 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) funding method as it is more consistent with Public Act 94-0004's requirement 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 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 value increasing, while the PUC method is not an unreasonable method, more plans use the Entry Age Normal (EAN) funding method to mitigate this affect. It should also be noted that the EAN method will be the required method to calculate liability for GASB 67 & GASB 68.

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

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 asset 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 (IRS) mandates this "corridor" for private sector pension plans (a 90%-110% corridor is mandated). Even though it is not mandated for public plans, we believe that the use of this type of corridor is a much 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

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the corresponding market value." **Therefore, we recommend that the GARS Board consider moving to this approach in future valuations.** It's important to note that currently a move to this corridor approach would have no impact on the 2013 actuarial valuation results, as the actuarial value of assets is already within the 80%-120% corridor (Recommendation #1).

**D. Determination of the Required State Contribution**

As required by Public Act 94-0004, in determining the required State contribution under State law, the actuary must determine what level of future contributions are needed to make a projection of the System's funded status in 2045 be at 90%. To make that determination, the actuary needs to make an assumption regarding the age/sex/salaries of new hires that replace existing members leaving over this period. This assumption is commonly referred to as the "New Entrant Profile". In addition to making that assumption, the actuary needs to apply actuarial methodologies to project the June 30, 2013 valuation into the future.

The "New Entrant Profile" assumption is a critical assumption as the required projection of 90% funding in the year 2045 means that the majority of active members will be new hires after the current June 30, 2013 valuation. **Therefore, we recommend that GRS disclose additional information in their valuation report as to how the New Entrant Profile, which is shown on page 36 of their June 30, 2013 Actuarial Valuation Report, was developed. In addition, we recommend GRS include all relevant information regarding the New Entrant Profile in the valuation report in order to better comply with ASOP No. 41 dealing with actuarial communications** (Recommendation #4).

**We also recommend that GRS continue to disclose in future valuations items needed to perform a comprehensive analysis of GRS' determination of the System's funded status in 2045** (Recommendation #6). The specific items are outlined in Section II: Proposed Certification of the Required State Contribution. We believe these would be appropriate disclosures under ASOP No. 41 and that the additional information will allow us to continue to perform a comprehensive analysis of GRS' determination of the required State contribution. Finally, we recommend again, as we did last year, that GRS include the historic development of assets without General Obligation Bonds.

**E. Other Issues**

*1. State Mandated Funding Method:*

In its draft 2013 Actuarial Valuation Report on pages 12-14, GRS offers commentary on the Statutory funding method from an actuarial point of view. They describe the Annual Required Contribution (ARC) under GASB 25 and 27 as a method designed to finance benefits for current participants to a 100% funding target over a projected period not to

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exceed 30 years, and which is often used as a de facto funding method. They contrast the ARC funding method with the current Statutory method and note that the Statutory policy produces a back-loaded contribution projection, where contributions are significantly deferred into the future. They also provide a chart on page 12 that “illustrates how significantly the current funding policy defers contributions into the future.” **This chart shows the projected funded ratio declining from 16% in 2013 to below 5% until 2029.**

GRS advises “strengthening the current statutory funding policy,” and provides the following examples:

- a. Reducing the projection period needed to reach 90 percent funding;
- b. Increasing the 90 percent funding target;
- c. Separating the financing of benefits for members hired before and after December 31, 2010; and
- d. Changing to an ARC based funding approach with an appropriate amortization policy for each respective Tiered benefit structure.

Illinois Pension Code (40 ILCS 5/2-124) is limited in meeting the risks of the System. This law requires that the actuary base the required contribution using a prescribed funding method that achieves a 90% funding in the year 2045.

**We concur with the GRS recommendations to increase the 90% funding target and to reduce the projection period, in accordance with generally accepted actuarial practices. At a minimum, future plan benefit accruals should be fully funded, to avoid continued systematic underfunding of GARS.**

It may be illustrative to include a comparison of the projected contributions and funded ratios under some combination of the items above as well.

**We suggest, due to the systematic underfunding of the System, that the GARS Board always use the conservative end of any range of assumptions recommended by GRS. We also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn (Recommendation #7).**

2. *State Mandated Projection Method:*

Under Public Act 96-0043, the actuarial methodologies utilized in performing the 2045 projection of the System's funded status, assume the future earnings rate (currently at 7.00%) is applied to the actuarial value of assets (AVA) rather than the market value of assets (MVA). GRS included an illustration of projected AVA with a phase in of the asset smoothing method gains and losses. We agree that this approach provides a more realistic expectation of the future direction of the contribution level. We have similar concerns over the implications of the law under the Act.

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The table on the following page demonstrates what the market value would have to earn in order for the actuarial value to earn 7.00% based on the ratio of actuarial value to market value. We recommend that consideration be given to require that the projected future earnings of the System be based on starting market values of assets (rather than a smoothed value).

**What the market value of assets (MVA) would need to earn in a given year, if the actuarial value of assets (AVA) are assumed to earn 7.00%, at various ratios of**

<u>Ratio of AVA to MVA</u>	<u>Required MVA Return</u>
130.00%	77.50%
125.00%	65.75%
120.00%	54.00%
115.00%	42.25%
110.00%	30.50%
105.00%	18.75%
100.00%	7.00%
95.00%	-4.75%
90.00%	-16.50%
85.00%	-28.25%
80.00%	-40.00%
75.00%	-51.75%
70.00%	-63.50%

*3. Payrolls used in Valuation*

**We recommend GRS provide additional clarity on the payrolls used in their valuation throughout their report to allow for a more complete evaluation by another qualified actuary as required by actuarial standards of practice (Recommendation #5c).**

**F. Preparations for GASB 67 & 68**

The Governmental Accounting Standards Board (GASB) adopted Statement No. 67 (GASB 67) **Financial Reporting for Pension Plans—an amendment of GASB Statement No. 25** and Statement No. 68 (GASB 68) **Accounting and Financial Reporting for Pensions—an amendment of GASB Statement No. 27**. GASB 67 is effective for periods beginning after June 15, 2013 and GASB 68 is effective for fiscal years beginning after June 15, 2014. The following is a brief summary of some of the changes contained in these statements:

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- The Total Pension Liability will be calculated using the individual entry age actuarial cost method.
- A new blended interest rate assumption will be based on (1) a long-term expected rate of return on pension plan investments to the extent that assets are projected to be sufficient to pay benefits based on future contributions intended to finance current member benefits (i.e., excluding normal cost contributions for new entrants), and (2) a tax-exempt, high-quality municipal bond rate to the extent that the conditions for use of the long-term expected rate of return are not met. This will mean the interest rate will be reduced if projected contributions plus assets are not able to cover projected pension benefits.
- The Unfunded Actuarial Liability, now called Net Pension Liability, will be calculated using the market value of assets instead of the smoothed actuarial value of assets.
- The entire Net Pension Liability will be recognized immediately on the employer's statement of net position.
- The Annual Required Contribution (ARC) will be eliminated. The new Pension Expense which equals: Normal Cost + Interest Cost - Expected Asset Earnings + Amortization of changes in total pension liability +/- five year differences on the actual vs. expected asset returns.
- Recognition periods of unexpected changes in net pension liability would vary depending upon the source for the change. These periods would be immediate for plan changes, five years for the difference between projected and actual investment earnings, and expected working lifetime of both active and inactive members for other total pension liability changes.

We have reviewed the System's strategy for implementing GASB 67 and 68 and summarized below.

- 1. The implementation, reporting, measurement and valuation dates for GASB 67 and 68.**
  - GARS will implement GASB 67 for their Fiscal Year 2014 (July 1, 2013 – June 30, 2014) Comprehensive Annual Financial Report.
  - GARS did not specify a date planned to implement GASB 68.
  - GARS has not determined the valuation date for GASB 67 & GASB 68.
  
- 2. The method that will be used to develop the annual financial reporting.**

GARS plans to reach out to their actuaries for further guidance, but at this point has not determined the method that will be used.
  
- 3. The projected "crossover" date (date of asset depletion), if any.**

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GARS plans to reach out to their actuaries for further guidance, but at this point has not determined a crossover date.

**4. The bond index that will be used to develop the interest rate for the period after the crossover date.**

GARS plans to reach out to their actuaries for further guidance, but at this point has not determined the bond index that will be used.

**5. The projected blended interest rate used for developing Net Pension Liability (NPL).**

GARS plans to reach out to their actuaries for further guidance, but at this point has not estimated a projected blended interest rate.

**6. Expected allocation method of NPL among employers if cost sharing plan.**

GARS plans to reach out to their actuaries for further guidance, but at this point has not determined an allocation method.

**7. Any unresolved issues concerning the implementation of either GASB 67 or 68.**

Significant additional planning will be required of GARS prior to implementation GASB 67 and GASB 68.

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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

**Response to recommendations in 2012:**

In the State Actuary's Preliminary Report on the General Assembly Retirement System of Illinois presented December 10, 2012, Cheiron made several recommendations. Below we summarize how these recommendations were reflected in this year's valuation report.

<b>General Assembly Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
<b><i>Recommended Changes to Actuarial Assumptions Used in the 2012 Valuation</i></b>		
Cheiron concluded the assumptions were reasonable and had no recommended changes to the assumptions.		
<b><i>Recommended Additional Disclosures for the 2012 Valuation:</i></b>		
<p>1. In the actuarial reports for years 2006 through 2011 (Sandor Goldstein) that we reviewed, there is a consistent Actuarial Liability loss item every year for "salary increases of inactive members who are participants in other Illinois public retirement systems". These liability losses totaled \$14.2 million over this six year period. However, we do not see any mention of this feature in the Plan Provisions section(s) and we do not see any explicit actuarial assumption for this item. There was no analysis of this specific item in the 2006-2010 Experience Study as well.</p> <p>We recommend GRS document the following in the June 30, 2012 valuation:</p> <ul style="list-style-type: none"> <li>• If this provision continues to exist under Illinois statutes, confirm that this plan provision was valued and include documentation of this in the plan provisions and actuarial assumptions sections.</li> <li>• If this provision continues to exist but has not been valued in the System's Actuarial Liability, we recommend adding an actuarial assumption that will capture the expected Actuarial Liability.</li> </ul>	Implemented	Addressed in April 17, 2013 Experience Review. A 10% load was added to inactive vested liabilities to reflect increases in inactive member's pay due to current participation in a reciprocal retirement system.

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<b>General Assembly Retirement System Status of Previous Recommendations</b>		
<b>Recommendation from 2012 Report</b>	<b>Status</b>	<b>Comments</b>
2. We recommend that GRS disclose, in their June 30, 2012 report, a complete description as to how the New Entrant Profile assumption was developed.	Partially Implemented	Limited explanation provided on page 36 of the 2013 valuation, but additional detail sufficient for another qualified actuary to review the development methodology is necessary.  Additional information regarding genders within the New Entrant Profile is needed since sex distinct mortality is used beginning with the 2013 valuation.  <b>Recommendation repeated and expanded.</b>
<b><i>Recommended Changes for Future Valuations:</i></b>		
1. We recommend GRS consider, in future valuations, establishing a corridor around the market value of assets of 80% to 120% beyond which the actuarial value is limited given the use of the actuarial value of assets in the projection methodology in accordance with Public Act 94-0004.	Not Implemented	This has not been addressed in the 2013 valuation.  <b>Recommendation repeated.</b>
2. We recommend that GRS consider using a fully generational mortality table so that future mortality improvements will continue to impact new entrants throughout the projection period ending in 2045.	Partially Implemented	Projected to 2015, but not fully-generational.  <b>Recommendation repeated.</b>
3. We recommend that GRS consider eliminating the disability assumption since there is very little or no actual incidence of disability, there is no distinct disabled mortality table being used, and there is no distinction in the retiree data shown in the report between current healthy and disabled annuitants.	Implemented	Was eliminated beginning with the 2013 valuation.



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**STATUS OF RECOMMENDATIONS FROM THE 2012 STATE ACTUARY'S REPORT**

General Assembly Retirement System Status of Previous Recommendations		
Recommendation from 2012 Report	Status	Comments
<i>Proposed Certification of the Required State Contribution:</i>		
1. We recommend that GRS disclose in the June 30, 2013 and later valuations the following items in order for us to continue to perform an analysis of the required State contribution in the future:		
<ul style="list-style-type: none"> <li>• Projections by year of future benefit payouts split by actives and current inactive (i.e. retirees, survivors, disabled, and deferred vested);</li> </ul>	Partially Implemented	The versions of Table 4 continue to only provide an aggregate amount of payouts, including expenses.  <b>Recommendation repeated.</b>
<ul style="list-style-type: none"> <li>• The present value of future benefits by year for actives, terminated vested, retirees and beneficiaries, and disabled members;</li> </ul>	Implemented	This has been addressed in Table 8 of the 2013 valuation.
<ul style="list-style-type: none"> <li>• A historic development of assets without General Obligation Bonds.</li> </ul>	Not Implemented	Significant questions remain on the projections that are fundamental to the development of the Required State Contributions.  <b>Recommendation repeated.</b>
2. All projections should show the active member information split into three distinct groups: current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.	Partially Implemented	This has been addressed in Tables 7-9 of the 2013 valuation, but the various versions of Table 4 do not split the projected benefit payouts into these three distinct groups.  <b>Recommendation repeated.</b>



# **APPENDICES**



**APPENDIX A**

**Public Act 097-0694**



AN ACT concerning government.

**Be it enacted by the People of the State of Illinois,  
represented in the General Assembly:**

Section 5. The Illinois State Auditing Act is amended by adding Section 2-8.1 as follows:

(30 ILCS 5/2-8.1 new)

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.

Section 10. The Illinois Pension Code is amended by changing Sections 2-134, 14-135.08, 15-165, 16-158, and 18-140 as follows:

(40 ILCS 5/2-134) (from Ch. 108 1/2, par. 2-134)

Sec. 2-134. To certify required State contributions and submit vouchers.

(a) The Board shall certify to the Governor on or before December 15 of each year until December 15, 2011 the amount of the required State contribution to the System for the next fiscal year and shall specifically identify the System's projected State normal cost for that fiscal year. The certification shall include a copy of the actuarial recommendations upon which it is based and shall specifically identify the System's projected State normal cost for that fiscal year.

On or before November 1 of each year, beginning November 1, 2012, 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 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 of each year beginning January 1, 2013, 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, 2013 and every 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.

On or before May 1, 2004, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2005, taking into account the amounts appropriated to and received by the System under subsection (d) of Section 7.2 of the General Obligation Bond Act.

On or before July 1, 2005, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2006, taking into account the changes in required State contributions made by this amendatory Act of the 94th General Assembly.



On or before April 1, 2011, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2011, applying the changes made by Public Act 96-889 to the System's assets and liabilities as of June 30, 2009 as though Public Act 96-889 was approved on that date.

(b) Beginning in State fiscal year 1996, on or as soon as possible after the 15th day of each month the Board shall submit vouchers for payment of State contributions to the System, in a total monthly amount of one-twelfth of the required annual State contribution certified under subsection (a). From the effective date of this amendatory Act of the 93rd General Assembly through June 30, 2004, the Board shall not submit vouchers for the remainder of fiscal year 2004 in excess of the fiscal year 2004 certified contribution amount determined under this Section after taking into consideration the transfer to the System under subsection (d) of Section 6z-61 of the State Finance Act. These vouchers shall be paid by the State Comptroller and Treasurer by warrants drawn on the funds appropriated to the System for that fiscal year. If in any month the amount remaining unexpended from all other appropriations to the System for the applicable fiscal year (including the appropriations to the System under Section 8.12 of the State Finance Act and Section 1 of the State Pension Funds Continuing Appropriation Act) is less than the amount lawfully vouchered under this Section, the difference shall be paid from the General Revenue Fund under the continuing appropriation authority provided in Section 1.1 of the State Pension Funds Continuing Appropriation Act.

(c) The full amount of any annual appropriation for the System for State fiscal year 1995 shall be transferred and made available to the System at the beginning of that fiscal year at the request of the Board. Any excess funds remaining at the end of any fiscal year from appropriations shall be retained by the System as a general reserve to meet the System's accrued liabilities.

(Source: P.A. 95-331, eff. 8-21-07; 96-1497, eff. 1-14-11; 96-1511, eff. 1-27-11.)

(40 ILCS 5/14-135.08) (from Ch. 108 1/2, par. 14-135.08)

Sec. 14-135.08. To certify required State contributions.

(a) To certify to the Governor and to each department, on or before November 15 of each year until November 15, 2011, the required rate for State contributions to the System for the next State fiscal year, as determined under subsection (b) of Section 14-131. The certification to the Governor under this subsection (a) shall include a copy of the actuarial recommendations upon which the rate is based and shall specifically identify the System's projected State normal cost for that fiscal year.

(a-5) On or before November 1 of each year, beginning November 1, 2012, 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 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 of each year beginning January 1, 2013, 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, 2013 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.

(b) The certifications under subsections (a) and (a-5) certification shall include an additional amount necessary to pay all principal of and interest on those general obligation bonds due the next fiscal year authorized by Section 7.2(a) of the General Obligation Bond Act and issued to provide the proceeds deposited by the State with the System in July 2003, representing deposits other than amounts reserved under Section 7.2(c) of the General Obligation Bond Act. For State fiscal year 2005, the Board shall make a supplemental certification of the additional amount necessary to pay all principal of and interest on those general obligation bonds due in State fiscal years 2004 and 2005 authorized by Section 7.2(a) of the General Obligation Bond Act and issued to provide the proceeds deposited by the State with the System in July 2003, representing deposits other than amounts reserved under Section 7.2(c) of the General Obligation Bond Act, as soon as practical after the effective date of this amendatory Act of the 93rd General Assembly.

On or before May 1, 2004, the Board shall recalculate and recertify to the Governor and to each department the amount of the required State contribution to the System and the required rates for State contributions to the System for State fiscal year 2005, taking into account the amounts appropriated to and received by the System under subsection (d) of Section 7.2 of the General Obligation Bond Act.

On or before July 1, 2005, the Board shall recalculate and recertify to the Governor and to each department the amount of the required State contribution to the System and the required rates for State contributions to the System for State fiscal year 2006, taking into account the changes in required State contributions made by this amendatory Act of the 94th General Assembly.

On or before April 1, 2011, the Board shall recalculate and recertify to the Governor and to each department the amount of the required State contribution to the System for State fiscal year 2011, applying the changes made by Public Act 96-889 to the

System's assets and liabilities as of June 30, 2009 as though Public Act 96-889 was approved on that date.

(Source: P.A. 96-1497, eff. 1-14-11; 96-1511, eff. 1-27-11.)

(40 ILCS 5/15-165) (from Ch. 108 1/2, par. 15-165)

Sec. 15-165. To certify amounts and submit vouchers.

(a) The Board shall certify to the Governor on or before November 15 of each year until November 15, 2011 the appropriation required from State funds for the purposes of this System for the following fiscal year. The certification under this subsection (a) shall include a copy of the actuarial recommendations upon which it is based and shall specifically identify the System's projected State normal cost for that fiscal year and the projected State cost for the self-managed plan for that fiscal year.

On or before May 1, 2004, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2005, taking into account the amounts appropriated to and received by the System under subsection (d) of Section 7.2 of the General Obligation Bond Act.

On or before July 1, 2005, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2006, taking into account the changes in required State contributions made by this amendatory Act of the 94th General Assembly.

On or before April 1, 2011, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2011, applying the changes made by Public Act 96-889 to the System's assets and liabilities as of June 30, 2009 as though Public Act 96-889 was approved on that date.

(a-5) On or before November 1 of each year, beginning November 1, 2012, 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 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 of each year, beginning January 1, 2013, 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, 2013 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, in a written response to the State Actuary, 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.

(b) The Board shall certify to the State Comptroller or employer, as the case may be, from time to time, by its president and secretary, with its seal attached, the amounts payable to the System from the various funds.

(c) Beginning in State fiscal year 1996, on or as soon as possible after the 15th day of each month the Board shall submit vouchers for payment of State contributions to the System, in a total monthly amount of one-twelfth of the required annual State contribution certified under subsection (a). From the effective date of this amendatory Act of the 93rd General Assembly through June 30, 2004, the Board shall not submit vouchers for the remainder of fiscal year 2004 in excess of the fiscal year 2004 certified contribution amount determined under this Section after taking into consideration the transfer to the System under subsection (b) of Section 6z-61 of the State Finance Act. These vouchers shall be paid by the State Comptroller and Treasurer by warrants drawn on the funds appropriated to the System for that fiscal year.

If in any month the amount remaining unexpended from all other appropriations to the System for the applicable fiscal year (including the appropriations to the System under Section 8.12 of the State Finance Act and Section 1 of the State Pension Funds Continuing Appropriation Act) is less than the amount lawfully vouchered under this Section, the difference shall be paid from the General Revenue Fund under the continuing appropriation authority provided in Section 1.1 of the State Pension Funds Continuing Appropriation Act.

(d) So long as the payments received are the full amount lawfully vouchered under this Section, payments received by the System under this Section shall be applied first toward the employer contribution to the self-managed plan established under Section 15-158.2. Payments shall be applied second toward the employer's portion of the normal costs of the System, as defined in subsection (f) of Section 15-155. The balance shall be applied toward the unfunded actuarial liabilities of the System.

(e) In the event that the System does not receive, as a result of legislative enactment or otherwise, payments sufficient to fully fund the employer contribution to the self-managed plan established under Section 15-158.2 and to fully fund that portion of the employer's portion of the normal costs of the System, as calculated in accordance with Section 15-155(a-1), then any payments received shall be applied proportionately to the optional retirement program established under Section 15-158.2 and to the employer's portion of the normal costs of the System, as calculated in accordance with Section 15-155(a-1).

(Source: P.A. 96-1497, eff. 1-14-11; 96-1511, eff. 1-27-11.)

(40 ILCS 5/16-158) (from Ch. 108 1/2, par. 16-158)

Sec. 16-158. Contributions by State and other employing units.

(a) The State shall make contributions to the System by means of appropriations from the Common School Fund and other State funds of amounts which, together with other employer contributions, employee contributions, investment income, and other income, will be sufficient to meet the cost of maintaining and administering the System on a 90% funded basis in accordance with actuarial recommendations.

The Board shall determine the amount of State contributions required for each fiscal year on the basis of the actuarial tables and other assumptions adopted by the Board and the recommendations of the actuary, using the formula in subsection (b-3).

(a-1) Annually, on or before November 15 until November 15, 2011, the Board shall certify to the Governor the amount of the required State contribution for the coming fiscal year. The certification under this subsection (a-1) shall include a copy of the actuarial recommendations upon which it is based and shall specifically identify the System's projected State normal cost for that fiscal year.

On or before May 1, 2004, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2005, taking into account the amounts appropriated to and received by the System under subsection (d) of Section 7.2 of the General Obligation Bond Act.

On or before July 1, 2005 ~~April 1, 2011~~, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2006, taking into account the changes in required State contributions made by this amendatory Act of the 94th General Assembly.

On or before April 1, 2011 ~~June 15, 2010~~, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2011, applying the changes made by Public Act 96-889 to the System's assets and liabilities as of June 30, 2009 as though Public Act 96-889 was approved on that date.

(a-5) On or before November 1 of each year, beginning November 1, 2012, 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 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 of each year, beginning January 1, 2013, 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, 2013 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.

(b) Through State fiscal year 1995, the State contributions shall be paid to the System in accordance with Section 18-7 of the School Code.

(b-1) Beginning in State fiscal year 1996, on the 15th day of each month, or as soon thereafter as may be practicable, the Board shall submit vouchers for payment of State contributions to the System, in a total monthly amount of one-twelfth of the required annual State contribution certified under subsection (a-1). From the effective date of this amendatory Act of the 93rd General Assembly through June 30, 2004, the Board shall not submit vouchers for the remainder of fiscal year 2004 in excess of the fiscal year 2004 certified contribution amount determined under this Section after taking into consideration the transfer to the System under subsection (a) of Section 6z-61 of the State Finance Act. These vouchers shall be paid by the State Comptroller and Treasurer by warrants drawn on the funds appropriated to the System for that fiscal year.

If in any month the amount remaining unexpended from all other appropriations to the System for the applicable fiscal year (including the appropriations to the System under Section 8.12 of the State Finance Act and Section 1 of the State Pension Funds Continuing Appropriation Act) is less than the amount lawfully vouchered under this subsection, the difference shall be paid from the Common School Fund under the continuing appropriation authority provided in Section 1.1 of the State Pension Funds Continuing Appropriation Act.

(b-2) Allocations from the Common School Fund apportioned to school districts not coming under this System shall not be diminished or affected by the provisions of this Article.

(b-3) For State fiscal years 2012 through 2045, the minimum contribution to the System to be made by the State for each fiscal year shall be an amount determined by the System to be sufficient to bring the total assets of the System up to 90% of the total actuarial liabilities of the System by the end of State fiscal year 2045. In making these determinations, the required State contribution shall be calculated each year as a level percentage of payroll over the years remaining to and including fiscal year 2045 and shall be determined under the projected unit credit actuarial cost method.

For State fiscal years 1996 through 2005, the State contribution to the System, as a percentage of the applicable employee payroll, shall be increased in equal annual increments so that by State fiscal year 2011, the State is contributing at the rate required under this Section; except that in the following specified State fiscal years, the State contribution to the System shall not be less than the following indicated percentages of the applicable employee payroll, even if the indicated percentage will produce a State

contribution in excess of the amount otherwise required under this subsection and subsection (a), and notwithstanding any contrary certification made under subsection (a-1) before the effective date of this amendatory Act of 1998: 10.02% in FY 1999; 10.77% in FY 2000; 11.47% in FY 2001; 12.16% in FY 2002; 12.86% in FY 2003; and 13.56% in FY 2004.

Notwithstanding any other provision of this Article, the total required State contribution for State fiscal year 2006 is \$534,627,700.

Notwithstanding any other provision of this Article, the total required State contribution for State fiscal year 2007 is \$738,014,500.

For each of State fiscal years 2008 through 2009, the State contribution to the System, as a percentage of the applicable employee payroll, shall be increased in equal annual increments from the required State contribution for State fiscal year 2007, so that by State fiscal year 2011, the State is contributing at the rate otherwise required under this Section.

Notwithstanding any other provision of this Article, the total required State contribution for State fiscal year 2010 is \$2,089,268,000 and shall be made from the proceeds of bonds sold in fiscal year 2010 pursuant to Section 7.2 of the General Obligation Bond Act, less (i) the pro rata share of bond sale expenses determined by the System's share of total bond proceeds, (ii) any amounts received from the Common School Fund in fiscal year 2010, and (iii) any reduction in bond proceeds due to the issuance of discounted bonds, if applicable.

Notwithstanding any other provision of this Article, the total required State contribution for State fiscal year 2011 is the amount recertified by the System on or before April 1, 2011 pursuant to subsection (a-1) of this Section and shall be made from the proceeds of bonds sold in fiscal year 2011 pursuant to Section 7.2 of the General Obligation Bond Act, less (i) the pro rata share of bond sale expenses determined by the System's share of total bond proceeds, (ii) any amounts received from the Common School Fund in fiscal year 2011, and (iii) any reduction in bond proceeds due to the issuance of discounted bonds, if applicable. This amount shall include, in addition to the amount certified by the System, an amount necessary to meet employer contributions required by the State as an employer under paragraph (e) of this Section, which may also be used by the System for contributions required by paragraph (a) of Section 16-127.

Beginning in State fiscal year 2046, the minimum State contribution for each fiscal year shall be the amount needed to maintain the total assets of the System at 90% of the total actuarial liabilities of the System.

Amounts received by the System pursuant to Section 25 of the Budget Stabilization Act or Section 8.12 of the State Finance Act in any fiscal year do not reduce and do not constitute payment of any portion of the minimum State contribution required under this Article in that fiscal year. Such amounts shall not reduce, and shall not be

included in the calculation of, the required State contributions under this Article in any future year until the System has reached a funding ratio of at least 90%. A reference in this Article to the "required State contribution" or any substantially similar term does not include or apply to any amounts payable to the System under Section 25 of the Budget Stabilization Act.

Notwithstanding any other provision of this Section, the required State contribution for State fiscal year 2005 and for fiscal year 2008 and each fiscal year thereafter, as calculated under this Section and certified under subsection (a-1), shall not exceed an amount equal to (i) the amount of the required State contribution that would have been calculated under this Section for that fiscal year if the System had not received any payments under subsection (d) of Section 7.2 of the General Obligation Bond Act, minus (ii) the portion of the State's total debt service payments for that fiscal year on the bonds issued in fiscal year 2003 for the purposes of that Section 7.2, as determined and certified by the Comptroller, that is the same as the System's portion of the total moneys distributed under subsection (d) of Section 7.2 of the General Obligation Bond Act. In determining this maximum for State fiscal years 2008 through 2010, however, the amount referred to in item (i) shall be increased, as a percentage of the applicable employee payroll, in equal increments calculated from the sum of the required State contribution for State fiscal year 2007 plus the applicable portion of the State's total debt service payments for fiscal year 2007 on the bonds issued in fiscal year 2003 for the purposes of Section 7.2 of the General Obligation Bond Act, so that, by State fiscal year 2011, the State is contributing at the rate otherwise required under this Section.

(c) Payment of the required State contributions and of all pensions, retirement annuities, death benefits, refunds, and other benefits granted under or assumed by this System, and all expenses in connection with the administration and operation thereof, are obligations of the State.

If members are paid from special trust or federal funds which are administered by the employing unit, whether school district or other unit, the employing unit shall pay to the System from such funds the full accruing retirement costs based upon that service, as determined by the System. Employer contributions, based on salary paid to members from federal funds, may be forwarded by the distributing agency of the State of Illinois to the System prior to allocation, in an amount determined in accordance with guidelines established by such agency and the System.

(d) Effective July 1, 1986, any employer of a teacher as defined in paragraph (8) of Section 16-106 shall pay the employer's normal cost of benefits based upon the teacher's service, in addition to employee contributions, as determined by the System. Such employer contributions shall be forwarded monthly in accordance with guidelines established by the System.



However, with respect to benefits granted under Section 16-133.4 or 16-133.5 to a teacher as defined in paragraph (8) of Section 16-106, the employer's contribution shall be 12% (rather than 20%) of the member's highest annual salary rate for each year of creditable service granted, and the employer shall also pay the required employee contribution on behalf of the teacher. For the purposes of Sections 16-133.4 and 16-133.5, a teacher as defined in paragraph (8) of Section 16-106 who is serving in that capacity while on leave of absence from another employer under this Article shall not be considered an employee of the employer from which the teacher is on leave.

(e) Beginning July 1, 1998, every employer of a teacher shall pay to the System an employer contribution computed as follows:

(1) Beginning July 1, 1998 through June 30, 1999, the employer contribution shall be equal to 0.3% of each teacher's salary.

(2) Beginning July 1, 1999 and thereafter, the employer contribution shall be equal to 0.58% of each teacher's salary.

The school district or other employing unit may pay these employer contributions out of any source of funding available for that purpose and shall forward the contributions to the System on the schedule established for the payment of member contributions.

These employer contributions are intended to offset a portion of the cost to the System of the increases in retirement benefits resulting from this amendatory Act of 1998.

Each employer of teachers is entitled to a credit against the contributions required under this subsection (e) with respect to salaries paid to teachers for the period January 1, 2002 through June 30, 2003, equal to the amount paid by that employer under subsection (a-5) of Section 6.6 of the State Employees Group Insurance Act of 1971 with respect to salaries paid to teachers for that period.

The additional 1% employee contribution required under Section 16-152 by this amendatory Act of 1998 is the responsibility of the teacher and not the teacher's employer, unless the employer agrees, through collective bargaining or otherwise, to make the contribution on behalf of the teacher.

If an employer is required by a contract in effect on May 1, 1998 between the employer and an employee organization to pay, on behalf of all its full-time employees covered by this Article, all mandatory employee contributions required under this Article, then the employer shall be excused from paying the employer contribution required under this subsection (e) for the balance of the term of that contract. The employer and the employee organization shall jointly certify to the System the existence of the contractual requirement, in such form as the System may prescribe. This exclusion shall cease upon the termination, extension, or renewal of the contract at any time after May 1, 1998.

(f) If the amount of a teacher's salary for any school year used to determine final average salary exceeds the member's annual full-time salary rate with the same employer

for the previous school year by more than 6%, the teacher's employer shall pay to the System, in addition to all other payments required under this Section and in accordance with guidelines established by the System, the present value of the increase in benefits resulting from the portion of the increase in salary that is in excess of 6%. This present value shall be computed by the System on the basis of the actuarial assumptions and tables used in the most recent actuarial valuation of the System that is available at the time of the computation. If a teacher's salary for the 2005-2006 school year is used to determine final average salary under this subsection (f), then the changes made to this subsection (f) by Public Act 94-1057 shall apply in calculating whether the increase in his or her salary is in excess of 6%. For the purposes of this Section, change in employment under Section 10-21.12 of the School Code on or after June 1, 2005 shall constitute a change in employer. The System may require the employer to provide any pertinent information or documentation. The changes made to this subsection (f) by this amendatory Act of the 94th General Assembly apply without regard to whether the teacher was in service on or after its effective date.

Whenever it determines that a payment is or may be required under this subsection, the System shall calculate the amount of the payment and bill the employer for that amount. The bill shall specify the calculations used to determine the amount due. If the employer disputes the amount of the bill, it may, within 30 days after receipt of the bill, apply to the System in writing for a recalculation. The application must specify in detail the grounds of the dispute and, if the employer asserts that the calculation is subject to subsection (g) or (h) of this Section, must include an affidavit setting forth and attesting to all facts within the employer's knowledge that are pertinent to the applicability of that subsection. Upon receiving a timely application for recalculation, the System shall review the application and, if appropriate, recalculate the amount due.

The employer contributions required under this subsection (f) may be paid in the form of a lump sum within 90 days after receipt of the bill. If the employer contributions are not paid within 90 days after receipt of the bill, then interest will be charged at a rate equal to the System's annual actuarially assumed rate of return on investment compounded annually from the 91st day after receipt of the bill. Payments must be concluded within 3 years after the employer's receipt of the bill.

(g) This subsection (g) applies only to payments made or salary increases given on or after June 1, 2005 but before July 1, 2011. The changes made by Public Act 94-1057 shall not require the System to refund any payments received before July 31, 2006 (the effective date of Public Act 94-1057).

When assessing payment for any amount due under subsection (f), the System shall exclude salary increases paid to teachers under contracts or collective bargaining agreements entered into, amended, or renewed before June 1, 2005.

When assessing payment for any amount due under subsection (f), the System shall exclude salary increases paid to a teacher at a time when the teacher is 10 or more years from retirement eligibility under Section 16-132 or 16-133.2.

When assessing payment for any amount due under subsection (f), the System shall exclude salary increases resulting from overload work, including summer school, when the school district has certified to the System, and the System has approved the certification, that (i) the overload work is for the sole purpose of classroom instruction in excess of the standard number of classes for a full-time teacher in a school district during a school year and (ii) the salary increases are equal to or less than the rate of pay for classroom instruction computed on the teacher's current salary and work schedule.

When assessing payment for any amount due under subsection (f), the System shall exclude a salary increase resulting from a promotion (i) for which the employee is required to hold a certificate or supervisory endorsement issued by the State Teacher Certification Board that is a different certification or supervisory endorsement than is required for the teacher's previous position and (ii) to a position that has existed and been filled by a member for no less than one complete academic year and the salary increase from the promotion is an increase that results in an amount no greater than the lesser of the average salary paid for other similar positions in the district requiring the same certification or the amount stipulated in the collective bargaining agreement for a similar position requiring the same certification.

When assessing payment for any amount due under subsection (f), the System shall exclude any payment to the teacher from the State of Illinois or the State Board of Education over which the employer does not have discretion, notwithstanding that the payment is included in the computation of final average salary.

(h) When assessing payment for any amount due under subsection (f), the System shall exclude any salary increase described in subsection (g) of this Section given on or after July 1, 2011 but before July 1, 2014 under a contract or collective bargaining agreement entered into, amended, or renewed on or after June 1, 2005 but before July 1, 2011. Notwithstanding any other provision of this Section, any payments made or salary increases given after June 30, 2014 shall be used in assessing payment for any amount due under subsection (f) of this Section.

(i) The System shall prepare a report and file copies of the report with the Governor and the General Assembly by January 1, 2007 that contains all of the following information:

(1) The number of recalculations required by the changes made to this Section by Public Act 94-1057 for each employer.

(2) The dollar amount by which each employer's contribution to the System was changed due to recalculations required by Public Act 94-1057.

(3) The total amount the System received from each employer as a result of the changes made to this Section by Public Act 94-4.

(4) The increase in the required State contribution resulting from the changes made to this Section by Public Act 94-1057.

(j) For purposes of determining the required State contribution to the System, the value of the System's assets shall be equal to the actuarial value of the System's assets, which shall be calculated as follows:

As of June 30, 2008, the actuarial value of the System's assets shall be equal to the market value of the assets as of that date. In determining the actuarial value of the System's assets for fiscal years after June 30, 2008, any actuarial gains or losses from investment return incurred in a fiscal year shall be recognized in equal annual amounts over the 5-year period following that fiscal year.

(k) For purposes of determining the required State contribution to the system for a particular year, the actuarial value of assets shall be assumed to earn a rate of return equal to the system's actuarially assumed rate of return.

(Source: P.A. 95-331, eff. 8-21-07; 95-950, eff. 8-29-08; 96-43, eff. 7-15-09; 96-1497, eff. 1-14-11; 96-1511, eff. 1-27-11; 96-1554, eff. 3-18-11; revised 4-6-11.)

(40 ILCS 5/18-140) (from Ch. 108 1/2, par. 18-140)

Sec. 18-140. To certify required State contributions and submit vouchers.

(a) The Board shall certify to the Governor, on or before November 15 of each year until November 15, 2011, the amount of the required State contribution to the System for the following fiscal year and shall specifically identify the System's projected State normal cost for that fiscal year. The certification shall include a copy of the actuarial recommendations upon which it is based and shall specifically identify the System's projected State normal cost for that fiscal year.

On or before November 1 of each year, beginning November 1, 2012, 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 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 of each year beginning January 1, 2013, 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, 2013 and every 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.

On or before May 1, 2004, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2005, taking into account the amounts appropriated to and received by the System under subsection (d) of Section 7.2 of the General Obligation Bond Act.

On or before July 1, 2005, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2006, taking into account the changes in required State contributions made by this amendatory Act of the 94th General Assembly.

On or before April 1, 2011, the Board shall recalculate and recertify to the Governor the amount of the required State contribution to the System for State fiscal year 2011, applying the changes made by Public Act 96-889 to the System's assets and liabilities as of June 30, 2009 as though Public Act 96-889 was approved on that date.

(b) Beginning in State fiscal year 1996, on or as soon as possible after the 15th day of each month the Board shall submit vouchers for payment of State contributions to the System, in a total monthly amount of one-twelfth of the required annual State contribution certified under subsection (a). From the effective date of this amendatory Act of the 93rd General Assembly through June 30, 2004, the Board shall not submit vouchers for the remainder of fiscal year 2004 in excess of the fiscal year 2004 certified contribution amount determined under this Section after taking into consideration the transfer to the System under subsection (c) of Section 6z-61 of the State Finance Act. These vouchers shall be paid by the State Comptroller and Treasurer by warrants drawn on the funds appropriated to the System for that fiscal year.

If in any month the amount remaining unexpended from all other appropriations to the System for the applicable fiscal year (including the appropriations to the System under Section 8.12 of the State Finance Act and Section 1 of the State Pension Funds Continuing Appropriation Act) is less than the amount lawfully vouchered under this Section, the difference shall be paid from the General Revenue Fund under the continuing appropriation authority provided in Section 1.1 of the State Pension Funds Continuing Appropriation Act.

(Source: P.A. 96-1497, eff. 1-14-11; 96-1511, eff. 1-27-11.)

Section 99. Effective date. This Act takes effect upon becoming law.



## **APPENDIX B**

### **Materials Reviewed by Cheiron**





# MATERIALS REVIEWED BY CHEIRON

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Following is a listing of information reviewed by Cheiron for each of the five State funded retirement systems. This is the information Cheiron relied upon in preparing the preliminary reports of the retirement systems.

## Teachers' Retirement System:

- Illinois Law:
  - Illinois Pension Code (10 ILCS 5/) Article 16: Teachers' Retirement System of the State of Illinois
  - Public Act 088-0593
  - Public Act 093-0002
  - Public Act 093-0839
  - Public Act 094-0004
  - Public Act 096-0043
  - Public Act 096-0889
  - Public Act 097-0694
  
- Files received from the Teachers' Retirement System:
  - Prior to June 30, 2012 State Actuary Report:*
    - 09.21.12 Rate of Return Decision Memo.pdf
    - AA Presentation RV Kuhns April 2011 Board FINAL.PDF
    - Buck - IL TRS Exp Analysis Report 2007revised.pdf
    - Buck August 2012 Board Meeting Presentation Experience Analysis.pdf
    - Buck IL TRS 2007 Valuation Report.pdf
    - Buck IL TRS 2008 Valuation Report.pdf
    - Buck IL TRS 2009 Valuation Report.pdf
    - Buck IL TRS 2010 Valuation Report IL TRS.pdf
    - Buck IL TRS 2011 Valuation Report.pdf
    - Buck IL TRS Exp Analysis Report 2012 FINAL.pdf
    - Buck May 2011 Board Meeting Investment Return Assumption.pdf
    - Buck October 2011 Board Meeting Presentation Valuation Results.pdf
    - Illinois TRS Investment Assumption History 1939-2012.pdf
    - Segal IL TRS Actuarial Audit Report-FINAL.pdf
    - TRS total fund net returns FY 1983-2011.xlsx

*Since the June 30, 2012 State Actuary Report:*

- Morgan Stanley October Memo – Municipal Bond Monthly
  - Illinois TRS - 2013 EROA Analysis Summary
  - 2013 09 06 Buck TRS Data Lag Approval
  - 2013-10 Presentation – RV Kuhns Investment Performance Review Slides
  - Preliminary 9-9-13 TRS Financials
  - Buck IL TRS 2013 Draft Valuation Report
  - Buck October 2013 Board Meeting Presentation
  - Buck 2013 Valuation Results Memo to Board Members
  - GASB Implementation email
  - Projected Liabilities by Tier
  - GAAP Information
  - 2013 10 31 TRS Preliminary FY 2015 Certification
- Files received from the Illinois Office of the Auditor General:
    - VERSIGHT Memo dated 12/9/2011 from Karl K. Oman
  - Other:
    - October 2013 *National Conference on Public Employees Retirement Systems (NCPERS) Public Fund Study*
    - Surveys published by the National Association of State Retirement Agencies (NASRA)
    - Surveys published by the Boston College's Center of Public Research (CPR)
    - June 2013 Moody's Median Report on *Adjusted Pension Liability Medians for US States*
    - *May 2013 Old-Age, Survivors and Disability Insurance Trustees Report (OASDI)*

**State Universities Retirement System**

- Illinois Law:
  - Illinois Pension Code (40 ILCS 5/) Article 15 : State Universities Retirement System of Illinois
  - Public Act 088-0593
  - Public Act 093-0002
  - Public Act 093-0839
  - Public Act 094-0004
  - Public Act 096-0043
  - Public Act 096-0889
  - Public Act 097-0694

- Files received from the State Universities Retirement System:
  - Prior to June 30, 2012 State Actuary Report:*
    - SURS 2010 Experience Study
    - SURS June 2012 Investment Update
    - SURS June 2011 Asset Allocation and Liability Study
    - SURS May 2011 Status Update of the Asset/ Liability Study
    - GRS IL SURS 2008 Valuation Report
    - GRS IL SURS 2009 Valuation Report
    - GRS IL SURS 2010 Valuation Report
    - GRS IL SURS 2011 Valuation Report
    - GRS IL SURS 2012 DRAFT Valuation Report
    - GRS IL SURS 2012 Certification of FY 2014 Required State Contribution
    - GRS IL SURS 2012 Data
    - GRS spreadsheet with additional details on Tables 13 and 14
    - IL Department of Insurance Bulletin - Annual Salary Maximum for Pension and Annuity Purposes, and Annual Cost of Living Allowance (COLA) for New Hires on or after January 1, 2011
  - Since the June 30, 2012 State Actuary Report:*
    - SURS 2nd Quarter 2013 Board Report
    - SURS 2013 Callan Periodic Table
    - SURS 2013 Capital Markets Illinois
    - SURS Compiled FY 2014 Investment Plan
    - SURS June 2013 Investment Update
    - GRS IL SURS 2013 DRAFT Valuation Report
    - GRS IL SURS Proposed 2013 Certification of FY 2015 Required State Contribution
    - GRS IL SURS 2013 Data
- Other:
  - October 2013 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Fund Study
  - Surveys published by the National Association of State Retirement Agencies (NASRA)
  - Surveys published by the Boston College's Center of Public Research (CPR)
  - June 2013 Moody's Median Report on *Adjusted Pension Liability Medians for US States*
  - *May 2013 Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)

## State Employees' Retirement System

- Illinois Law:
  - Illinois Pension Code (40 ILCS 5/) Article 14: State Employees' Retirement System of Illinois
  - Public Act 088-0593
  - Public Act 093-0002
  - Public Act 093-0839
  - Public Act 094-0004
  - Public Act 096-0043
  - Public Act 096-0889
  - Public Act 097-0694
  
- Files received from the State Employees' Retirement System:
  - Prior to June 30, 2012 State Actuary Report:*
    - SERS Five-Year Experience Analysis for the Period 2006-2010 (GRS – 7/12/2011)
    - SERS Funding Policy Review from GRS on 10/19/2010
    - SERS Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2011
    - GRS IL SERS 2007 Valuation Report
    - GRS IL SERS 2008 Valuation Report
    - GRS IL SERS 2009 Valuation Report
    - GRS IL SERS 2010 Valuation Report
    - GRS IL SERS 2011 Valuation Report
    - GRS IL SERS 2012 DRAFT Valuation Report
    - GRS IL SERS 2012 Certification
    - GRS IL SERS 2012 Data
  
  - Since the June 30, 2012 State Actuary Report:*
    - SERS Valuation Discount Rate Change Study (GRS – 2/5/2013)
    - GRS IL SERS 2013 DRAFT Valuation Report
    - GRS IL SERS 2013 Proposed Certification
    - GRS IL SERS 2013 Data
  
- Other:
  - October 2013 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Fund Study
  - Surveys published by the National Association of State Retirement Agencies (NASRA)

- Surveys published by the Boston College's Center of Public Research (CPR)
- June 2013 Moody's Median Report on *Adjusted Pension Liability Medians for US States*
- *May 2013 Old-Age, Survivors and Disability Insurance Trustees Report (OASDI)*

### **Judges' Retirement System**

- Illinois Law:
  - Illinois Pension Code (40 ILCS 5/) Article 18: Judges' Retirement System of Illinois
  - Public Act 088-0593
  - Public Act 093-0002
  - Public Act 093-0839
  - Public Act 094-0004
  - Public Act 096-0043
  - Public Act 096-0889
  - Public Act 097-0694
  
- Files received from the Judges' Retirement System:
  - Prior to June 30, 2012 State Actuary Report:*
    - JRS Experience Study: Five-Year Experience Analysis for the Period 2006-2010 (Goldstein & Associates – 7/18/2011)
    - JRS Investment Return Assumption letter (Goldstein & Associates – 10/6/2010)
    - JRS Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2011
    - Goldstein & Associates JRS 2006 Valuation Report
    - Goldstein & Associates JRS 2007 Valuation Report
    - Goldstein & Associates JRS 2008 Valuation Report
    - Goldstein & Associates JRS 2009 Valuation Report
    - Goldstein & Associates JRS 2010 Valuation Report
    - Goldstein & Associates JRS 2011 Valuation Report
    - GRS IL JRS 2012 DRAFT Valuation Report
    - GRS IL JRS 2012 Certification
    - GRS IL JRS 2012 Data
    - GRS IL JRS 2013 DRAFT Valuation Report
    - GRS IL JRS March 29, 2013 Experience Review
  
  - Since the June 30, 2012 State Actuary Report:*
    - JRS Experience Review: March 29, 2013

- GRS IL JRS 2013 DRAFT Valuation Report
- GRS IL JRS 2013 Data
- Other:
  - October 2013 *National Conference on Public Employees Retirement Systems* (NCPERS) Public Fund Study
  - Surveys published by the National Association of State Retirement Agencies (NASRA)
  - Surveys published by the Boston College's Center of Public Research (CPR)
  - June 2013 Moody's Median Report on *Adjusted Pension Liability Medians for US States*
  - *May 2013 Old-Age, Survivors and Disability Insurance Trustees Report* (OASDI)

### **General Assembly Retirement System**

- Illinois Law:
  - Illinois Pension Code (40 ILCS 5/) Article 2: General Assembly Retirement System of Illinois
  - Public Act 088-0593
  - Public Act 093-0002
  - Public Act 093-0839
  - Public Act 094-0004
  - Public Act 096-0043
  - Public Act 096-0889
  - Public Act 097-0694
- Files received from the General Assembly Retirement System:
  - Prior to June 30, 2012 State Actuary Report:*
    - GARS Experience Study: Five-Year Experience Analysis for the Period 2006-2010 (Goldstein & Associates – 8/11/2011)
    - GARS Comprehensive Annual Financial Report for the Fiscal Year Ended June 30, 2011
    - Goldstein & Associates GARS 2006 Valuation Report
    - Goldstein & Associates GARS 2007 Valuation Report
    - Goldstein & Associates GARS 2008 Valuation Report
    - Goldstein & Associates GARS 2009 Valuation Report
    - Goldstein & Associates GARS 2010 Valuation Report
    - Goldstein & Associates GARS 2011 Valuation Report
    - GRS IL GARS 2012 DRAFT Valuation Report
    - GRS IL GARS 2012 Certification

- GRS IL GARS 2012 Data

*Since the June 30, 2012 State Actuary Report:*

- GARS IL Experience Review (GRS - April 17, 2013)
- GRS IL GARS 2013 DRAFT Valuation Report
- GRS IL GARS 2013 Data

- Other:

- October 2013 *National Conference on Public Employees Retirement Systems (NCPERS) Public Fund Study*
- Surveys published by the National Association of State Retirement Agencies (NASRA)
- Surveys published by the Boston College's Center of Public Research (CPR)
- June 2013 Moody's Median Report on *Adjusted Pension Liability Medians for US States*
- *May 2013 Old-Age, Survivors and Disability Insurance Trustees Report (OASDI)*





## **APPENDIX C**

### **Responses from the Retirement Systems**





## Teachers' Retirement System of the State of Illinois

2815 West Washington Street | P.O. Box 19253 | Springfield, Illinois 62794-9253

Richard W. Ingram, Executive Director  
members@trs.illinois.gov | <http://trs.illinois.gov>  
(800) 877-7896 | for the hearing impaired: (866) 326-0087

December 16, 2013

VIA ELECTRONIC MAIL ([jbutcher@auditor.illinois.gov](mailto:jbutcher@auditor.illinois.gov))

Joe Butcher  
Office of the Auditor General  
740 East Ash Street, First Floor  
Springfield, IL 62703

Re: State Actuary's Preliminary Report under Public Act 097-0694, December 2013

Dear Mr. Butcher:

Thank you for directing the state actuary's review of our 2013 actuarial valuation report and preliminary 2015 state funding certification. While Cheiron did not require additional calculations to be performed this year, it suggests additional disclosure for the 2013 report and has recommendations for next year.

The TRS Board of Trustees finalized its certification of the fiscal year 2015 state contribution on December 6, 2013 and considered the recommendations made by Cheiron. The board agreed to issue a revised 2013 actuarial report including some of the additional information Cheiron suggests. The revised report will be submitted with the final funding certification by the January 15, 2014 deadline.

For Cheiron's 2014 review, we expect to have more information available in the spring. The General Assembly is not likely to request as much special work from the retirement systems and their actuaries. Also, our earlier review of the investment return assumption and Buck's earlier receipt of participant data (both described below) should make next year's schedule less compressed.

Following are responses to Cheiron's recommendations in the 2013 draft report (pages 2-5).

- 1) Cheiron agrees that, in general, the other assumptions used in the 2013 valuation report are reasonable. However, Cheiron urges the TRS board to lower the investment return assumption in 2014 from the current 8.0%.**

Cheiron repeats its recommendation that TRS examine this assumption annually. TRS and Cheiron have agreed to a more workable timeline for discussing the investment return assumption, beginning months earlier in the annual valuation process. In April 2014, the system's investment consultant, RVK, will be presenting the results of its latest asset allocation study. At that meeting or in May, Buck Consultants will discuss the 8.0% return in the context of the allocation selected by the board. If the board decides to change the assumption, it will be used in the 2014 valuation.

We will provide Cheiron with the results of this review in time for Cheiron to comment. If Cheiron has concerns, they can be addressed with the board at its August 2014 meeting, before the actuarial valuation work is completed.

In 2015, TRS will be conducting the next actuarial experience analysis, two years earlier than required by statute. After the 8.0% assumption was adopted in 2012, the board resolved to conduct the next experience analysis earlier due to more rapidly changing economic conditions. We believe the board's current process for reviewing this key assumption with its actuary and its investment consultant is already rigorous, but in 2014 we will provide Cheiron more documentation and provide it earlier than we did in 2013.

**2) Include the normal cost development by tier in all projections.**

Buck provided Cheiron with this schedule under separate cover and will include it in the revised 2013 actuarial report.

**3) Disclose liabilities by participant class (active, inactive, deferred vested, receiving benefits) and by tier.**

Liabilities by tier were also provided under separate cover. For the 2014 report, we plan to add schedules that demonstrate the benefit discrepancies between tiers 1 and 2. We will be valuing the two groups separately and show funded status by tier. Due to the volume of additional work requested by the legislature this summer and fall, there was not enough time to make these modifications this year.

**4) Reconcile implications of change in census lag procedure and explain.**

Until 2013, the actuarial valuation was based on the current year's benefit recipients and the prior year's active/inactive members. The current year's participant file was sent to the actuary in late August, after the majority of May/June retirements were processed. Active/inactive information was always older because employers do not report teacher data to TRS in time for it to be used in the current valuation.

In 2013, the methodology was changed to use all participant data from the prior year. This eliminates the need to wait for new retirements to be processed. More significantly, it eliminates the "mismatch" between the active and retired populations due to actives who retire, die, terminate, or become disabled in the subsequent year. Buck believed eliminating the mismatch would reduce "other" unexplained losses in the reconciliation of the unfunded liability, and it did. (See item 6.)

Cheiron asks why the benefit recipient counts and payments are different if the same data were used in the 2012 and 2013 valuations. The values shown in the 2013 report include additional claims put into payment status retroactively after the benefit recipient file was originally run in August 2012. The liability adjustment is explained on pages 42 and 44 of the Buck's 2013 report.

Buck planned to provide more analysis of the impact of this process change, but legislative requests in the summer and fall crowded out some of the additional valuation work.

**5) Explain the change in the board’s policy for determining the federal contribution rate so users can understand the rationale and the implications of this change.**

The rationale for the change was discussed at length with the board and is well documented on the TRS website and in TRS publications. TRS stands by the analysis provided to Cheiron.

**6) Add more explanation of “other” in the reconciliation of the unfunded liability.**

The value of “other” in this year’s valuation is significantly smaller than in prior years. One of the main reasons we changed our data reporting methodology for this valuation was to lessen the impact of the data lag in reconciling the active and retired populations. (See item 4.) We will further study ways to reduce the value of this balancing item in the reconciliation.

**7) Provide more disclosure on some of the actuarial assumptions to comply with ASOP 41.**

We will continue to evaluate Cheiron’s comments on additional disclosure. Our goal is to strike the appropriate balance between usefulness to the board and satisfying actuarial standards.

**8) Review economic assumptions prior to the valuation.**

See response to item 1, above.

**9) Consider adding an 80%/120% corridor around the market value of assets. This was also recommended last year.**

We still believe this would require a statutory change, and a 20% corridor does not seem necessary since the current five-year period is short enough for market and actuarial assets to reconcile within a short time. As noted in our response to last year’s review, we asked Segal to comment on such a corridor when it performed an actuarial audit of Buck in 2010. Segal did not support such a change.

In our opinion, corridors might be useful when plans use asset smoothing periods longer than five years. In the actuary’s opinion, smoothing periods of five years or less tend to self-correct.

**10) Include all information requested by Cheiron in the final actuarial report, not as supplements or under separate cover.**

We agree to provide certain additional schedules and explanations in the revised report.

**11) Miscellaneous**

We will review Cheiron’s recommendations for additional disclosure and implement as needed.

**12) Include in the valuation reports the explicit development of the required state contribution, showing all sub-components.**

We have reviewed the current disclosure and it appears to us that the information needed to determine the state contribution is already contained in the report. The actuary will be happy to discuss this issue further with Cheiron.

**13) State mandated funding method does not meet actuarial standards of practice but the alternative funding approaches are not sufficiently described in the valuation cover letter or report.**

As noted last year, we agree with Cheiron's recognition that Illinois funding law left the state retirement systems severely underfunded. In recognition of the major differences between Illinois funding law and standard funding procedures, the trustees directed the actuaries to calculate what those state requirements would be if contributions were directly tied to the actuarial health of the system.

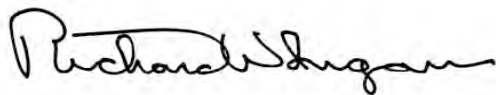
Cheiron notes that these additional approaches are not well explained and they may or may not agree that they are the appropriate methods. The alternative approaches used are ones that are familiar to the TRS trustees and Illinois policymakers. We will consider whether Buck should add more explanation to the report but they have already been discussed at length with the board.

We continue studying the text of the new law and it appears to contain some traces of the old funding law. The new law will be explained and compared to actuarial standards of practice in the 2014 actuarial valuation report.

The June 30, 2014 actuarial valuation will contain many changes. Some will be due to Public Act 98-0599 and some will be due to the new GASB requirements. Several of the additional disclosures suggested by Cheiron will be included as well. We will also be reviewing the investment return earlier in this process, as described above.

We would be happy to discuss any of these points with you and Cheiron. Thank you again for Cheiron's careful review of Buck's work.

Very truly yours,



Richard Ingram  
Executive Director

cc: Jim Schlouch, Auditor General  
Gene Kalwarski, Cheiron  
Ken Kent, Cheiron  
Mike Noble, Cheiron  
Jennie Fisher, Cheiron  
Larry Langer, Buck Consultants  
Paul Wilkinson, Buck Consultants  
Jana Bergschneider, TRS  
Kathleen Farney, TRS







December 18, 2013

Mr. William G. Holland  
Auditor General  
740 East Ash Street  
Springfield, IL 62703

**Re: Response to the State Actuary Report of 2013**

Dear Mr. Holland:

This is the official response from the State Universities Retirement System of Illinois (SURS) regarding the December 2013 preliminary report issued by Cheiron – The State Actuary’s Preliminary Report on the State Universities Retirement System of Illinois under Public Act 097-6094.

What follows is a summary response which also includes a detailed response for each of the recommendations from our actuary, Gabriel Roeder Smith & Company (GRS).

**Recommendations**

**A. Assessment of Actuarial Assumptions Used in the 2013 Valuation**

1. In its report Cheiron found the actuarial assumptions reasonable for the 2013 valuation. However, Cheiron recommends that SURS lower its discount rate from 7.75% to 7.25% or lower for future years beginning with the June 30, 2014, or explain the rationale for the continued use of the 7.75% discount rate.

We agree with the State Actuary’s recommendation the need to review the discount rate to determine if further reduction is required for the June 30, 2014 valuation. The Board will take the recommendation to lower the discount rate to 7.75% or lower under advisement and make a final decision regarding the discount rate after they have had the opportunity to understand the financial impact of pension reform, perform an asset liability study, and conduct an economic study. Any decision regarding the discount rate prior to the June 30, 2014 evaluation would appear to be premature without fully understanding the financial impact of pension reform to both revenue (funding) and expense (benefits).

## **B. Recommended Additional Disclosures for the 2013 Valuation**

2. Examination of the recurring loss for benefit recipients and adjustment to assumptions if the loss persists.

SURS staff provided additional data fields to GRS to improve the valuation. The detailed response from GRS is included in the attached GRS Response to State Actuary Report of 2013 letter.

3. Include an explanation of the rationale to lower the Effective Rate of Interest.

SURS provided the State Actuary the copy of the September 13, 2012 SURS Investment Committee minutes approving an economic study of the Effective Rate of Interest (ERI), the completed GRS economic study, and the December 13, 2012 SURS Investment Committee minutes approving the reduction of the ERI from 7.75% to 7.00%. We believe this is sufficient explanation of the rationale to lower the ERI.

## **C. Recommended Changes for Future Valuations**

4. Establish a corridor around the market value of assets beyond which the actuarial value is limited given the use of the actuarial asset value in the projections methodology in accordance with the Statute.

SURS and GRS concur with this recommendation. The SURS Board and GRS cannot administratively implement a corridor based on our interpretation of the following statute.

Sec. 15-155. Employer contributions.

(1) For purposes of determining the required State contribution to the System, the value of the System's assets shall be equal to the actuarial value of the System's assets, which shall be calculated as follows:

As of June 30, 2008, the actuarial value of the System's assets shall be equal to the market value of the assets as of that date. In determining the actuarial value of the System's assets for fiscal years after June 30, 2008, any actuarial gains or losses from investment return incurred in a fiscal year shall be recognized in equal annual amounts over the 5-year period following that fiscal year.

(m) For purposes of determining the required State contribution to the system for a particular year, the actuarial value of assets shall be assumed to earn a rate of return equal to the system's actuarially assumed rate of return.

5. Review the economic assumptions each year prior to commencing the valuation work and adjust assumptions accordingly.

SURS and GRS concur with this recommendation. The SURS Board will review as recommended.

6. Include description of Annual Compensation Increases be changed in the Actuarial Valuation Report.

SURS and GRS concur with this recommendation. The recommended disclosure is included in the attached Actuarial Valuation Report for 2013.

7. Change to a fully generational mortality table.

SURS and GRS concur with this recommendation. The Society of Actuaries is scheduled to release a new mortality table in 2014. GRS proposes that SURS implement this table upon completion of the SURS 2010-2014 experience study.

**D. Proposed Certification of the Required State Contributions**

8. Include projected maximum contribution calculation without Government Obligation Bonds.

SURS and GRS concur with this recommendation. The recommended disclosure is included in the Actuarial Valuation Report for 2013 prospective.

**E. State Mandated Funding Method**

9. Due to the systematic underfunding of the system, use a stress test to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn.

SURS and GRS concur with this recommendation. The SURS Board will consider conducting a stress test in conjunction with the asset liability study or after pension reform has been implemented.

Mr. Holland, please call me if you have any questions concerning these responses.

Sincerely yours,



William E. Mabe  
Executive Director

Encl: Actuarial Valuation Report  
Gabriel Roeder Smith & Company Response to State Actuary Report of 2013

cc: Michael J. Noble, Cheiron  
Joseph Butcher, Office of the Auditor General  
Thomas L. Kizziah, Office of the Auditor General  
Joseph J. Evans, McGladrey LLP

December 12, 2013

Board of Trustees  
State Universities Retirement System of Illinois  
1901 Fox Drive  
Champaign, Illinois 61820

**Re: Response to State Actuary Report of 2013**

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 Universities Retirement System of Illinois (“SURS”) Under Public Act 097-0694. This report was a review of the June 30, 2013 actuarial valuation.

**Assessment of Actuarial Assumptions Used in the 2013 Valuation**

Item 1) The issue of greatest concern raised by Cheiron is that they want to see the discount rate (assumed rate of investment return) reduced from 7.75% to 7.25% for the actuarial valuation as of June 30, 2014, or receive a detailed explanation for why that change is not made. This report issued by the State Actuary, Cheiron, indicates that **“In summary, our review of the assumptions and methods used in the June 30, 2013 actuarial valuation, which were used to determine the required Fiscal Year 2015 State Contribution, found that while most of the assumptions were reasonable individually, we are not comfortable with the continued use of a 7.75% interest rate assumption for reasons explained in this report.”**

At the October SURS Board meeting there was a presentation reviewing the discount rate and the Board discussed the matter of potentially lowering the discount rate. The State Actuary has now requested that the SURS Board either lower the discount rate for the June 30, 2014 actuarial valuation or provide substantial justification for using a higher rate.

**Recommended Additional Disclosures for the 2013 Valuation**

Item 2) Cheiron recommends additional analysis and more thorough disclosure for the determination of the source of the benefit recipients and termination losses. We recently completed a review with Staff on this issue. We have found that over the years these losses have been reduced. For Fiscal Years 2010, 2011, 2012 and 2013, the loss due to “Benefit Recipient” was \$104.7 million, \$100.8 million, \$55.5 million, and \$31.2 million respectively. This loss includes mortality gains and losses as well as gains and losses due to unexpected changes in benefit amounts from year to year. Unexpected changes may occur when benefits that are initially paid as preliminary estimates are finalized. Beginning with the valuation as of June 30, 2011, there is an additional load of 10% on the liabilities of those retirees who are currently receiving benefits as a preliminary estimate. In 2013, Staff provided additional data fields (including the best formula amount benefit for members paid as a preliminary estimate) in order to better measure the liabilities for retirees whose benefits have not been finalized. These data fields are being used in the valuation

and were contained in the data file sent to the State Actuary. In light of the recent review, using additional data fields and the pattern of decrease, we recommend no further action at this time.

Item 3) Cheiron recommends including an explanation of the rationale to lower the Effective Rate of Interest in the June 30, 2013 actuarial valuation report. That study was done as a separate report and we understand Staff has forwarded to Cheiron a copy of that study.

### **Recommended Changes for Future Valuations**

Item 4) Cheiron concurs with the idea of a corridor being established around the market value of assets. We are concerned that the development of the actuarial value of assets is set in statute and thus requires legislative action for change. It would therefore be beyond the purview of the SURS Board to add such a corridor.

Item 5) Cheiron recommends the Board annually review the economic assumptions (interest rate and inflation) each year prior to commencing the valuation work and adjust assumptions accordingly. The Board reviewed an analysis of the investment return assumption at their October Board meeting.

Item 6) Cheiron recommends a change in the description of Annual Compensation increases. GRS concurs and has forwarded an updated report with this change to Staff.

Item 7) Cheiron recommends that GRS consider using a fully generational mortality table so that future mortality improvements will continue to impact new entrants throughout the projection period ending in 2045. GRS concurs and we propose to look at the generational mortality issue concurrent with the next experience study. A new mortality table is scheduled for release in 2014 by the Society of Actuaries and we will review this table in conjunction with the SURS experience study.

### **Proposed Certification of the Required State Contribution**

Cheiron has requested a more detailed explanation of the selection of the current new entrant profile. We have provided a full description in the valuation. The new entrant profile is constructed from the current active members who have 1-4 years of service. From this current group of new entrants a full “new entrant” profile is constructed and used to populate the active membership in future years. New entrants have a variety of profiles that are a match to the current set of new entrants. If Cheiron would like further information, we recommend they provide a sample of a disclosure that provides the information they are seeking.

State Mandated Funding Method: Cheiron suggests that the SURS Board always use the conservative end of any range of assumptions and they also recommend stress testing be done to determine whether there will be sufficient assets to pay benefits if there is a significant market downturn. GRS would be glad to work with the Board on a stress-test study.

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Page 3

**We will continue with the additional disclosures and add the balance of the requested items, if they remain a valid part of the valuation process. For example, under pension reform (SB 1), there will no longer be a need to create historical assets based on the issuance of the GOBs.**

Sincerely,







Leslie Thompson, FSA, EA, MAAA  
Senior Consultant









Amy Williams, ASA, MAAA  
Consultant

AW:kb

cc: David Kausch, Gabriel, Roeder, Smith & Company  
Lance Weiss, Gabriel, Roeder, Smith & Company  
Kristen Brundirks, Gabriel, Roeder, Smith & Company

State Universities Retirement System Status of Previous State Actuary Recommendations (Taken from Appendix A of Cheiron's Report)			
Recommendations from State Actuary 2012 Report	Cheiron Comment on Status	GRS Comment on Status	Notes
<i>Recommended Changes to Actuarial Assumptions Used in the 2012 Valuation</i>			
<b>Cheiron concluded the assumptions were reasonable and had no recommended changes to the assumptions.</b>			
<i>Recommended Additional Disclosures for the 2012 valuation</i>			
<b>1. Cheiron recommended GRS revise its June 30, 2012 valuation to include projections of the maximum contribution calculation without General Obligation Bonds (GOBs).</b>	Implemented		Provided for 2012 in supplemental material in December 2012. Addressed on page 31 of the 2013 valuation report.
<b>2. Cheiron recommended GRS disclose in the June 30, 2012 report a complete description as to how the New Entrant Profile assumption was developed.</b>	Implemented		Provided for 2012 in supplemental material in December 2012. Addressed on page 42 of the 2013 valuation report. <b>Recommend more detail in future reports.</b>
<i>Recommended Changes for Future Valuations</i>			
<b>1. Cheiron concurs with GRS' recommendation to establish a corridor around the market value of assets beyond which the actuarial value is limited given the use of the actuarial asset value in the projection methodology in accordance with statute.</b>	Not implemented	Need to determine jurisdiction for the proposed change.  	<b>Recommendation Repeated.</b>
<b>2. Cheiron recommends GRS include a complete disability incidence table in future reports.</b>	Implemented		Addressed on page 38 of the 2013 valuation report.
<b>3. Cheiron recommends a continued examination of the recurring loss for benefit recipients and adjustment to assumptions if the loss persists.</b>	Not implemented	Staff provided additional data which is being used in the 2013 valuation.	This has not been addressed in the 2013 valuation. <b>Recommendation repeated and expanded.</b>

<p><b>4. Cheiron recommends the Board annually review the interest rate assumptions.</b></p>	<p>Not implemented</p>	<p>Review was conducted at October Board meeting in accordance with this recommendation.</p>	<p>Although the Board may have reviewed the interest rate assumption, no change to the rate has been made.  <b>Recommendation repeated and expanded.</b></p>
<p><b>5. Cheiron recommends that GRS demonstrate the development of the capped pay calculated in the report.</b></p>	<p>Implemented</p>		<p>Addressed on page 44 of the 2013 valuation report.</p>
<p><i>Proposed Certification of the Required State Contribution:</i></p>			
<p><b>1. Cheiron recommends that GRS disclose in the June 30, 2013 valuation and later valuations the following items in order for them to perform a more comprehensive analysis of the required State contribution in the future:</b></p>	<p>Implemented</p>		<p>Addressed in Section E of 2013 valuation report</p>
<ul style="list-style-type: none"> <li>• <b>Projections by year of future benefit payouts for actives and current inactive (i.e., retirees, survivors, disabled and deferred vested).</b></li> </ul>	<p>Implemented</p>		<p>Addressed in Section E of 2013 valuation report</p>
<ul style="list-style-type: none"> <li>• <b>Projections by year of future SURS normal costs and member contributions.</b></li> </ul>	<p>Implemented</p>		<p>Addressed in Section E of 2013 valuation report</p>
<ul style="list-style-type: none"> <li>• <b>The present value of future benefit for actives, terminated vested, retirees and beneficiaries and disabled members.</b></li> </ul>	<p>Implemented</p>		<p>Addressed in Section E of 2013 valuation report</p>
<ul style="list-style-type: none"> <li>• <b>For each of the items the impact of the Self-Managed Plan (SMP) needs to be clearly delineated.</b></li> </ul>	<p>Implemented</p>		<p>Addressed in Section E of 2013 valuation report</p>



<ul style="list-style-type: none"> <li><b>Cheiron recommends GRS include the historic development of assets without General Obligation Bonds (GOB) in future reports</b></li> </ul>	<p>Partially implemented</p>	<p>✓ and          X (may no longer be required under pension reform)</p>	<p>Partially addressed on page 30 of the 2013 valuation. The report demonstrated the development of the actuarial value of assets without the GOB for a single year, but Cheiron again requests historic development of assets back to the issuance of the GOB. <b>Recommendation repeated.</b></p>
<ul style="list-style-type: none"> <li><b>All projections should show the active member information split into three district groups; current actives hired prior to January 1, 2011; current actives hired on or after January 1, 2011; and new entrants after the valuation date.</b></li> </ul>	<p>Implemented</p>	<p>✓</p>	<p>Addressed in Section E of 2013 valuation report</p>



December 16, 2013

Mr. Timothy Blair  
Executive Secretary  
State Retirement Systems  
2101 S. Veterans Parkway  
P.O. Box 19255  
Springfield, IL 62794-9255

**Re: State Employees' Retirement System – State Actuary Review**

Dear Tim:

We have reviewed the State Actuary's preliminary report for the State Employees' Retirement System of Illinois (SERS). In general, we agree with most of the recommendations made by the State Actuary. We believe the recommendations will improve the measurement of the system's liabilities and contribution requirements. Following is our response to the recommendations as summarized on pages two, three and four of the State Actuary's report dated December 4, 2013. We understand that most of the recommendations, except for additional disclosure on retirement losses, apply to valuations on and after June 30, 2014.

(1) Interest rate

- a. With respect to the investment return assumption, GRS presented information to the SERS Board on February 5, 2013, comparing the current investment return assumption of 7.75 percent and an alternative assumption of 7.50 percent. Based on this study, the likelihood of achieving 7.75 percent or 7.50 percent is approximately 39 percent or 42 percent, respectively. We believe that either assumption can be supported for the June 30, 2013, valuation based on the existing Actuarial Standards of Practice No. 27.

We believe that either assumption can be supported by the revised Actuarial Standard of Practice No. 27. Under the Standard, all economic assumptions must be selected to be consistent with the purpose of the measurement. The purpose of the measurement is to determine the contribution rate which will lead to the accumulation of assets to pay benefits when due. Either assumption (7.75% or 7.50%) is below the arithmetic mean of 7.83% as disclosed in our February 5, 2013 presentation to the SERS Board. Section 3.8.3 j. of the revised Actuarial Standard of Practice No. 27 states that "the use of a forward looking expected arithmetic return as an investment return assumption will produce a mean accumulated value."

- b. GRS will provide information to the SERS Board on the investment return assumption and other economic assumptions as well as education on the revised Standard of Practice No. 27 which was adopted by the Actuarial Standards Board in September of 2013, and applies to a work product with a measurement date on and after September 30, 2014.

- c. Assets for SERS, General Assembly Retirement System (GARS), and Judges Retirement System (JRS) are invested in one combined trust. Assets for each respective plan are accounted for separately, and are not fungible. That is, assets earmarked for one plan cannot be used to pay benefits of another plan within the trust. Because of the funded ratio and liquidity needs of GARS and JRS, we believe it is reasonable to assume a lower investment return for GARS and JRS when compared to SERS.

(2) Demographic assumptions

- a. GRS will be conducting an experience study that will first be applicable to the June 30, 2014, valuation. In that study, we will make recommendations on the following:
  - i. Retirement rates
  - ii. Disability load
  - iii. Generational mortality rates
  - iv. Termination rates
- b. As part of the experience study, we will consider how the Tier 1 and Tier 2 benefit structure could impact the preceding assumptions.

(3) Asset corridor

- a. The asset valuation method is prescribed by statute, and does not appear to allow a corridor.

(4) Additional disclosure

- a. GRS will provide additional disclosure on the IRC 415(b) limits, IRC 401(a)(17) limits, and COLA for Tier 2 members, including the future growth rate.
- b. GRS will provide more details on the new entrant profile including a breakout by benefit type, age, gender and salary distribution.
- c. GRS will provide additional details explaining the retirement losses in the June 30, 2013, valuation report.

(5) Projection data

- a. GRS will provide projections with: “future benefit payouts split by actives and current inactives, separate from expenses”
- b. GRS will continue to provide projection data separated by: “Current actives hired prior January 1, 2011, current actives hired on or after January 1, 2011, and new entrants hired after the valuation date” in the appendix of the valuation report.

Mr. Timothy Blair  
State Retirement Systems  
December 13, 2013  
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(6) Historical development of assets

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

(7) State mandated funding policy

- a. As stated on page 11 of our report: “The current statutory policy tends to back-load and defer contributions, and we would advise strengthening the current statutory funding policy. The Board has taken steps to strengthen the current statutory funding policy by adopting a lower assumed rate of return and more conservative assumptions.” Furthermore, the funding policy under the recently enacted Public Act 98-0599 is expected to strengthen the funding of the plan.

(8) Stress test

- a. We agree that it is reasonable to “stress test” assets available to pay benefits.

Please let us know if you have any questions or comments.

Sincerely,



Alex Rivera, FSA, EA, MAAA  
Senior Consultant



David Kausch, FSA, EA, MAAA  
Senior Consultant



Paul T. Wood, ASA, MAAA  
Consultant



December 13, 2013

Mr. Timothy Blair  
Executive Secretary  
State Retirement Systems  
2101 S. Veterans Parkway  
P.O. Box 19255  
Springfield, IL 62794-9255

**Re: Judges' Retirement System – State Actuary Review**

Dear Tim:

We have reviewed the State Actuary's preliminary report for Judges' Retirement System of Illinois (JRS). In general, we agree with most of the recommendations made by the State Actuary. We believe the recommendations will improve the measurement of the system's liabilities and contribution requirements. Following is our response to the recommendations as summarized on pages two, three and four of the State Actuary's report dated December 4, 2013. We understand the recommendations apply to valuations on and after June 30, 2014.

(1) Interest rate and other economic assumptions

- a. GRS will provide information to the JRS Board on the investment return assumption and other economic assumptions based on the revised Standard of Practice No. 27 which was adopted by the Actuarial Standards Board in September of 2013, and applies to a work product with a measurement date on and after September 30, 2014.

(2) Demographic assumptions

- a. GRS will be conducting an experience study that will first be applicable to June 30, 2014, valuation for the State Employees Retirement System (SERS). This study will include a review of generational mortality. Because the mortality experience for JRS is not credible, we will use the experience from SERS as a basis in the consideration of a generational mortality recommendation for JRS.
- b. GRS will consider revisions to the Tier 2 termination and salary scale assumptions.

(3) Asset corridor

- a. The asset valuation method is prescribed by statute, and does not appear to allow a corridor.

(4) Additional disclosure

- a. GRS will provide additional disclosure on the IRC 415(b) limits, IRC 401(a)(17) limits, and COLA for Tier 2 members, including the future growth rate.

- b. GRS will provide more details on the new entrant profile including a breakout by benefit type, age, gender and salary distribution.
- c. GRS will provide more details on the valuation payroll.

(5) Projection data

- a. GRS will provide projections with: “future benefit payouts split by actives and current inactives, separate from expenses”
- b. GRS will continue to provide projection data separated by: “Current actives hired prior January 1, 2011, current actives hired on or after January 1, 2011, and new entrants hired after the valuation date” in the appendix of the valuation report.

(6) Additional valuation data

- a. GRS will request additional data relating to retirees who have elected the spouse continuance benefit option.
- b. GRS will provide more details on the assumption relating to spouse continuation benefits for inactive members.
- c. GRS will request additional data relating to members who “either freeze their benefit and discontinue contributions or pay contributions only on salary increase once they are eligible to receive the maximum rate of annuity.” GRS will consider changes to valuation process based on the experience provided by the system.

(7) Historical development of assets

- a. The development of the actuarial smoothed value of assets with GOB proceeds and the hypothetical smoothed value of assets without GOB proceeds are provided in each respective historical valuation report performed by GRS since the GOB proceeds were deposited into the trust. The prior actuary did not include details of the hypothetical asset value; therefore, at the time of transition, GRS estimated the deferred gains and losses used to develop the hypothetical smoothed value of assets. If necessary, we can provide details of the estimation.

(8) State mandated funding policy

- a. As stated on page 13 of our report: “The current statutory funding policy tends to back-load and defer contributions, and we would advise strengthening the current statutory funding policy. Examples of other methods to strengthen the current funding policy include: 1) Reducing the projection period needed to reach 90 percent funding, 2) Increasing the 90 percent funding target, and 3) Separating the financing of benefits for members hired before and after December 31, 2010. Finally, the statutory contribution policy could also be strengthened by changing to



an ARC based funding approach with an appropriate amortization policy for each respective tiered benefit structure.”

(9) Stress test

- a. We agree that it is reasonable to “stress test” assets available to pay benefits.

Please let us know if you have any questions or comments.

Sincerely,



Alex Rivera, FSA, EA, MAAA  
Senior Consultant



David Kausch, FSA, EA, MAAA  
Senior Consultant

Paul T. Wood, ASA, MAAA  
Consultant



December 13, 2013

Mr. Timothy Blair  
Executive Secretary  
State Retirement Systems  
2101 S. Veterans Parkway  
P.O. Box 19255  
Springfield, IL 62794-9255

**Re: General Assembly Retirement System – State Actuary Review**

Dear Tim:

We have reviewed the State Actuary's preliminary report for General Assembly Retirement System of Illinois (GARS). In general, we agree with most of the recommendations made by the State Actuary. We believe the recommendations will improve the measurement of the system's liabilities and contribution requirements. Following is our response to the recommendations as summarized on pages two, three and four of the State Actuary's report dated December 4, 2013. We understand the recommendations apply to valuations on and after June 30, 2014.

- (1) Interest rate and other economic assumptions
  - a. GRS will provide information to the GARS Board on the investment return assumption and other economic assumptions based on the revised Standard of Practice No. 27 which was adopted by the Actuarial Standards Board on September of 2013, and applies to a work product with a measurement date on and after September 30, 2014.
- (2) Demographic assumptions
  - a. GRS will be conducting an experience study that will first be applicable to June 30, 2014, valuation for the State Employees Retirement System (SERS). This study will include a review of generational mortality. Because the mortality experience for GARS is not credible, we will use the experience from SERS as a basis in the consideration of a generational mortality recommendation for GARS.
  - b. GRS will consider revisions to the Tier 2 termination and salary scale assumptions.
- (3) Asset corridor
  - a. The asset valuation method is prescribed by statute, and does not appear to allow a corridor.
- (4) Additional disclosure
  - a. GRS will provide additional disclosure on the IRC 415(b) limits, IRC 401(a)(17) limits, and COLA for Tier 2 members, including the future growth rate.
  - b. GRS will provide more details on the new entrant profile including a breakout by benefit type, age, gender and salary distribution.

- c. GRS will provide more details on the valuation payroll.
- (5) Projection data
- a. GRS will provide projections with: “future benefit payouts split by actives and current inactive, separate from expenses”
  - b. GRS will continue to provide projection data separated by: “Current actives hired prior January 1, 2011, current actives hired on or after January 1, 2011 and new entrants hired after the valuation date” in the appendix of the valuation report.
- (6) Historical development of assets
- a. The development of the actuarial smoothed value of assets with GOB proceeds and the hypothetical smoothed value of assets without GOB proceeds are provided in each respective historical valuation report performed by GRS since the GOB proceeds were deposited into the trust. The prior actuary did not include details of the hypothetical asset value; therefore, at the time of transition, GRS estimated the deferred gains and losses used to develop the hypothetical smoothed value of assets. If necessary, we can provide details of the estimation.
- (7) Additional valuation data
- a. GRS will request additional data relating to retirees who have elected the spouse continuance benefit option.
  - b. GRS will provide more details on the assumption relating to spouse continuation benefits for inactive members.
- (8) State mandated funding policy
- a. As stated on page 13 of our report: “The current statutory policy tends to back-load and defer contributions, and we would advise strengthening the current statutory funding policy.” The funding policy under the recently enacted Public Act 98-0599 is expected to strengthen the funding of the plan.
- (9) Stress test
- a. We agree that it is reasonable to “stress test” assets available to pay benefits.

Please let us know if you have any questions or comments.

Sincerely,



Alex Rivera, FSA, EA, MAAA  
Senior Consultant



David Kausch, FSA, EA, MAAA  
Senior Consultant

Paul T. Wood, ASA, MAAA  
Consultant