General Assembly Retirement System of Illinois

Annual Actuarial Valuation as of June 30, 2019

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October 18, 2019

Board of Trustees
General Assembly Retirement System of Illinois
Springfield, Illinois

Re: General Assembly Retirement System of Illinois Actuarial Valuation as of June 30, 2019

Dear Board Members:

The results of the June 30, 2019, Annual Actuarial Valuation of the General Assembly Retirement System of Illinois ("GARS" or "System") are presented in this report. The purposes of the valuation are to measure the System's funding status and to determine the State's contribution rate for the fiscal year beginning July 1, 2020, and ending June 30, 2021. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with benefits described in this report, for purposes other than those identified above may be significantly different.

Gabriel, Roeder, Smith & Company ("GRS") has prepared this report exclusively for the Trustees of the General Assembly Retirement System of Illinois; GRS is not responsible for reliance upon this report by any other party. This report may be provided to parties other than GARS only in its entirety and only with the permission of the Trustees.

The State's contribution rate has been determined under Illinois statues, in particular under 40 ILCS Section 5/2-124. Information required by GASB Statements Nos. 67 and 68 is provided in a separate report. The System's current contribution rate determined under the statutory funding policy may not conform with the Actuarial Standards of Practice. Therefore, the Board adopted a policy to be used to calculate the Actuarially Determined Contribution ("ADC") under GASB Statements Nos. 67 and 68 for financial reporting purposes.

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Although the statutory contribution requirements were met, the statutory funding method generates a contribution requirement that is less than a reasonable actuarially determined contribution. Meeting the statutory requirement does not mean that the undersigned agree that adequate actuarial funding has been achieved. We recommend the adherence to a funding policy, such as the Board policy used to calculate the ADC under GASB Statements Nos. 67 and 68, that funds the normal cost of the plan as well as an amortization payment that seeks to pay off any unfunded accrued liability over a closed period of 20 years.

The contribution requirement in this report is determined using the actuarial assumptions and methods disclosed in Section E of this report. This report includes risk metrics beginning on page 14, but does not include a more robust assessment of the risks if future experience deviates from the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This actuarial valuation assumed the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

The findings in this report are based on data and other information through June 30, 2019. The actuarial valuation was based upon information furnished by GARS staff, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by GARS staff.

This report was prepared using actuarial assumptions adopted by the Board as authorized under the Illinois Pension Code. The actuarial assumptions used for the June 30, 2019, actuarial valuation are based on an experience review for the three-year period from July 1, 2015 through June 30, 2018. Pursuant to Public Act 99-0232, GARS is required to conduct an actuarial experience review once every three years. All actuarial assumptions used in this report are reasonable for the purposes of this actuarial valuation. Additional information about the actuarial assumptions is included in Section E of this report.

Public Act 100-0023, effective July 6, 2017, modified the State's funding policy beginning with fiscal year 2018, by phasing in contribution rate variances due to changes in actuarial assumptions over a five year period. The State's contribution requirements provided in this report are determined in accordance with Public Act 100-0023.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the GARS as of the actuarial valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

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

Respectfully submitted,

Gabriel, Roeder, Smith & Company

Alex Rivera, FSA, EA, MAAA, FCA	Heidi G. Barry, ASA, MAAA, FCA	Jeffrey T. Tebeau, FSA, EA, MAAA
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SECTION A

SUMMARY OF ACTUARIAL VALUATION RESULTS

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Introduction

The law governing the General Assembly Retirement System of Illinois ("GARS" or "System") requires the Actuary, as the technical advisor to the Board of Trustees to:

> "...make an annual valuation of the liabilities and reserves of the System, an annual determination of the amount of the required State contributions and certify the results thereof to the board. (40 ILCS Section 5/2-146 (2))."

Gabriel, Roeder, Smith & Company ("GRS") has been retained by the Board of Trustees to perform an actuarial valuation as of June 30, 2019. In this report, we present the results of the actuarial valuation and the appropriation requirements under Public Act 88-0593, Public Act 93-0002, Public Act 93-0839, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023 for fiscal year ending June 30, 2021.

The actuarial valuation was completed based upon membership and financial data provided by the administrative staff of the System. The actuarial assumptions used were based on an experience review for the three-year period ending June 30, 2018. The cost method used to determine the benefit liabilities is the Projected Unit Credit Cost Method. For actuarial valuation purposes, as well as projection purposes, the actuarial value of assets is based on a five-year smoothing method.

Changes Since Last Valuation

Recent Legislative Changes

The following recently passed Public Acts impact GARS as follows.

Public Act ("P.A.") 100-0023, effective July 6, 2017, modified the State's funding policy to include smoothing State contribution rate increases or decreases due to changes in actuarial assumptions, including investment return assumptions, over a five-year period in equal annual amounts beginning in fiscal year 2018. In addition, changes in actuarial or investment assumptions that increased or decreased the State contribution rate in fiscal years 2014 through 2017 are to be smoothed over a five-year period in equal annual amounts, applying only to the portion of the five-year phase-in that is applicable to fiscal years on and after 2018. The fiscal year 2018 State contribution was recertified, pursuant to P.A. 100-0023.

A summary of the GARS plan provisions is included in Section F of this report.

Assumptions and Methods

The actuarial valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The actuarial assumptions used for the June 30, 2019, actuarial valuation are based on the Experience Study report for the three-year period from July 1, 2015 through June 30, 2018.

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Summary of the Actuarial Valuation

As a result of the 2018 experience review, the Board approved the following changes to the assumptions to be used in the June 30, 2019, actuarial valuation:

- Reduce the investment return assumption from 6.75 percent to 6.50 percent;
- Reduce the general (price) inflation assumption from 2.50 percent to 2.25 percent;
- Reduce the wage inflation assumption from 2.75 percent to 2.50 percent;
- Reduce the salary increase assumption;
- Update the mortality tables to the Pub-2010 Above-Median Income General Healthy Retiree and Employee Mortality Tables with adjustments for the System's credibility factors and future mortality improvements using scale MP-2018;
- Update the normal and early retirement rates to better reflect observed experience; and
- Update the turnover rates to better reflect observed experience.

The change in the assumptions detailed above decreased the actuarial accrued liability as of June 30, 2019, by $8.8 million or 2.3%.

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

On the following page is a summary of the key actuarial valuation results for the current and prior plan years.

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Key Valuation Results

Actuarial Valuation Date:	June 30, 2019	June 30, 2018
Fiscal Year Ending:	**June 30, 2021**	**June 30, 2020**
Estimated Statutory Contributions:		
· Annual Amount	$ 27,299,000	$ 25,754,000
· Percentage of Projected Capped Payroll for Fiscal Year	277.973%	257.780%
Actuarially Determined Contribution[a] (ADC):		
· Annual Amount	$ 34,432,777	$ 34,410,810
· Percentage of Projected Capped Payroll for Fiscal Year	350.609%	344.430%
Membership		
· Number of		
- Active Members	126	132
- Members Receiving Payments	441	417
- Inactive Members	69	68
- Total	636	617
· Covered Uncapped Payroll Provided by System	$ 10,159,312	$ 10,711,024
· Projected Capped Payroll For Fiscal Year	$ 9,820,850	$ 9,990,645
· Annualized Benefit Payments	$ 25,010,011	$ 23,392,469
Assets		
· Market Value of Assets (MVA)	$ 59,719,220	$ 56,816,384
· Actuarial Value of Assets (AVA)	$ 60,057,098	$ 57,618,152
· Return on MVA	6.10%	6.95%
· Return on AVA	5.21%	7.02%
· Ratio – AVA to MVA	100.57%	101.41%
Actuarial Information		
· Employer Normal Cost Amount	$ 2,001,416	$ 2,506,923
· Actuarial Accrued Liability (AAL)	$ 374,597,259	$ 375,778,593
· Unfunded Actuarial Accrued Liability (UAAL)	$ 314,540,161	$ 318,160,441
· Funded Ratio based on AVA	16.03%	15.33%
· UAAL as % of Covered Payroll	3,096.08%	2,970.40%
· Funded Ratio based on MVA	15.94%	15.12%

[a] *For contributions in fiscal years ending on and after June 30, 2017, the Board adopted a recommended policy used to develop the Actuarially Determined Contribution (ADC) as defined in GASB Statements Nos. 67 and 68. The policy adopted by the Board calculates the ADC as the Normal Cost plus a 20-year level percent of capped payroll closed-period amortization of the Unfunded Accrued Liability. As of June 30, 2019, the remaining amortization period is 16 years. The ADC is used for financial reporting purposes only.*

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Appropriation Requirements under P.A. 88-0593, P.A. 96-0002, P.A. 93-0839, P.A. 94-0004, P.A. 96-0043 and P.A. 100-0023

The law governing the System under P.A. 88-0593 provides that:

For fiscal years 2011 through 2045, the minimum contribution to the System for each fiscal year shall be an amount determined to be sufficient to cause the total assets of the System to equal 90 percent of the total actuarial liabilities of the System by the end of fiscal year 2045. In making these determinations, the required contribution shall be calculated each year as a level-percentage-of-payroll over the years remaining to and including fiscal year 2045 and shall be determined under the projected unit credit actuarial cost method. For fiscal years 1997 through 2010, the minimum contribution to the System, as a percentage of the payroll, shall be increased in equal annual increments so that by fiscal year 2010, the contribution rate is at the same level as the contribution rate for fiscal years 2011 through 2045.

The above calculation provides the basis for calculating the appropriation requirements under P.A. 93-0002. For fiscal years 2005 and later, the contributions under P.A. 93-0002 start with a calculation of the contribution based upon the hypothetical asset value which assumes no infusion from the proceeds of the General Obligation Bond ("GOB") sale that were deposited July 1, 2003 (Table 4a). This contribution is then reduced by the debt service beginning in fiscal year 2005 to produce the maximum contribution. For fiscal years 2006 and 2007, the maximum contribution is equal to the contribution amounts stated in P.A. 94-0004 for each respective year. The contribution amounts stated in P.A. 94-0004 are $4,157,000 for fiscal year 2006 and $5,220,300 for fiscal year 2007. A second projection is performed to develop the P.A. 88-0593 formula rate, which includes the GOB deposit. The lower of this formula rate with the GOB assets included and the maximum contribution is the required state appropriation (Table 4b).

Pursuant to Public Act 96-0043, for the calculation of the fiscal year 2011 contribution and beyond, the value of the System's assets shall be equal to the actuarial value of the System's assets. As of June 30, 2008, the actuarial value of the System's assets shall be equal to the market value of the assets as of that date. In determining the actuarial value of the System's assets for fiscal years after June 30, 2008, any actuarial gains or losses from investment return incurred in a fiscal year shall be recognized in equal annual amounts over the five-year period following that fiscal year. Furthermore, for purposes of determining the required State contribution to the System for a particular year, the projected actuarial value of assets shall be assumed to earn a rate of return equal to the System's actuarially assumed rate of return.

Public Act ("P.A.") 100-0023, effective July 6, 2017, modified the State's funding policy to include smoothing State contribution rate increases or decreases due to changes in actuarial assumptions, including investment return assumptions, over a five-year period in equal annual amounts beginning in fiscal year 2018. In addition, changes in actuarial or investment assumptions that increased or decreased the State contribution rate in fiscal years 2014 through 2017 are to be smoothed over a five-year period in equal annual amounts, applying only to the portion of the five-year phase-in that is applicable to fiscal years on and after 2018. The development of the contribution rate phase-in schedule that applies to State contribution rates determined on and after fiscal year 2020 is provided on page 43.

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Development of the Actuarial Value of Assets Based upon the Market Value of Assets

The following tables outline the reconciliation of the market value of assets and the development of the hypothetical asset value as of June 30, 2019. Also, the tables show the development of the actuarial value of assets under both the market value and the hypothetical value of assets.

1. Market Value of Assets 6/30/2018	$ 56,816,384
2. Actual State Contribution Amount	23,221,000
3. Employee Contribution Amount	1,349,613
4. Benefit Payouts & Refunds	(24,727,360)
5. Administrative Expenses	(389,833)
6. Investment Income	3,449,416
7. Market Value of Assets 6/30/2019	59,719,220
8. Expected Investment Return at 6.75%	3,816,960
9. Investment Gain/(Loss) Current Year	(367,544)
10. Deferred Investment Gains and (Losses) All Years	(337,878)
11. Actuarial Value of Assets 6/30/2019 (7. - 10.)	$ 60,057,098

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Development of the Actuarial Value of Assets Based upon the Hypothetical Value of Assets

The hypothetical asset value assumes no infusion from the proceeds of the GOB sale that were deposited July 1, 2003.

1. Hypothetical Value of Assets 6/30/2018	$	10,951,778
2. State Contribution Amount[a]		26,824,627
3. Employee Contribution Amount		1,349,613
4. Benefit Payouts & Refunds		(24,727,360)
5. Administrative Expenses		(389,833)
6. Investment Income[b]		759,918
7. Hypothetical Value of Assets 6/30/2019		14,768,743
8. Expected Investment Return at 6.75%		840,736
9. Investment Gain/(Loss) Current Year		(80,818)
10. Deferred Investment Gains and (Losses) All Years		(55,652)
11. Hypothetical Actuarial Value of Assets 6/30/2019 (7. - 10.)	$	14,824,395

[a] *Represents FY 2019 no POB basic contribution. This amount was determined as part of the June 30, 2017 actuarial valuation, and is based upon the hypothetical asset value which assumes no infusion from the proceeds of the GOB sale that were deposited July 1, 2003.*

[b] *Investment income assumes hypothetical value of assets earns the Fund's actual rate of return for fiscal year 2019 of 6.10 percent.*

The development of the actuarial smoothed value of assets with GOB proceeds and the hypothetical smoothed value of assets without GOB proceeds are provided in each respective historical valuation report GRS has produced since the GOB proceeds were deposited into the trust.

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State Contribution Requirement for Fiscal Year 2021

The fiscal year ending June 30, 2020, and June 30, 2021, certified contribution requirements and projected future year required State contribution rates and amounts, assuming deferred investments gains and losses are recognized in the assets, are as follow:

Fiscal Year Ending June 30,	Base Contribution	Assumed Capped Payroll	Total Required Contribution
2020	**257.780%**	**$9,991,000**	**$25,754,000**
2021	**277.973%**	**9,821,000**	**27,299,000**
2022	284.816%	9,557,000	27,220,000
2023	283.333%	9,366,000	26,537,000
2024	282.455%	9,248,000	26,121,000
2025	281.396%	9,031,000	25,413,000
2026	280.261%	8,987,000	25,187,000
2027	279.181%	8,934,000	24,942,000
2028	276.677%	8,779,000	24,289,000
2029	275.153%	8,806,000	24,230,000

For fiscal years 2020 through 2033, the base contribution may be limited by the maximum contribution determined under the assumption that the proceeds of the GOB sale were not deposited; therefore, the contribution rate is not level as a percent of pay.

Pursuant to Public Act 96-0043, the fiscal year 2021 contribution rate is calculated assuming the actuarial value of assets as of July 1, 2019, earns a rate of return equal to the System's actuarially assumed rate of return. Pursuant to Public Act 100-0023, contribution rates for fiscal years 2020 through 2025 include smoothing of contribution rate variances due to changes in actuarial assumptions.

The contributions for fiscal years 2022 and beyond, as presented above, are developed in Tables 4c and 4d in this report. In those projections, the actuarial valuations as of June 30 for years 2020 through 2023 have been projected as though an actuarial valuation in each of those years was performed. At each projected actuarial valuation, an additional 20 percent of the investment gains and losses are recognized. The market value of assets at June 30, 2019, is assumed to have a rate of return equal to the valuation interest rate going forward. Therefore, the actuarial value of assets is calculated by adjusting the market value at each respective actuarial valuation date by the remaining percentage of the investment gains and losses. The actuarial value of assets converges to market value in 2023, when all remaining investment gains and losses have been recognized. Because the deferred asset gains and losses are incorporated into the projections, the projections found in Tables 4c and 4d do not show a stable contribution rate until the impact of the five-year asset smoothing has been fully realized.

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Method of Calculation for Appropriation Requirements

The results are based on the projected unit credit actuarial cost method, the data provided and actuarial assumptions used for the June 30, 2019, actuarial valuation. In order to determine projected contribution rates and amounts, the following additional assumptions were used:

- Projected annualized capped payroll of $9,991,000 for fiscal year 2020.
- Total employer contributions of $25,754,000 for fiscal year 2020.
- Administrative expenses of $395,450 for fiscal year 2020, as provided by the System.
- New entrants whose average age is 41.85, average uncapped pay is $83,694 (2019 dollars) and average capped pay is $82,631 (2019 dollars). Based on the assumption that 50 percent of future members elect to opt out of the pension system, the population is projected to decrease from 126 members as of the valuation date, to 66 members in 2045 and ultimately reach 63 members in 2054.
- Projected benefits for members hired on or after January 1, 2011, are based on the plan provisions established in P.A. 96-0889.

The average increase in total uncapped payroll for the 26-year projection period is approximately 2.50 percent per year. It is important to note that benefits for new hires are based on capped payroll which is ultimately projected to grow at 2.25 percent per year. All results in this actuarial valuation assume that State contributions will be made on capped pay.

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To determine the contribution rates, the expected 2020 appropriation was converted to a percentage of the expected 2020 payroll. An amortization schedule was then determined based on the assumption that:

- The ratio of total assets to total actuarial liabilities will be 90 percent by June 30, 2045.
- The actuarial value of assets shall be assumed to earn a rate of return equal to the System's actuarially assumed rate of return.
- The contribution rates for fiscal years 2010 through 2033 will not be uniform, but the rate for any one of these years will be the minimum of: the difference between the "without-GOB" contribution and the debt service, and the underlying formula rate as determined by Public Act 88-0593.
- The contribution rate for fiscal year 2020 will be 257.780 percent based on expected total employer contributions of $25,754,000.
- The contribution rates for fiscal years 2034 through 2045 will be a uniform percentage of capped payroll.
- The contribution rates for fiscal years 2020 through 2025 are reduced according to the phase-in schedule provided on page 43.

The certified 2021 contribution rate of 277.973 percent is applied to expected FY 2021 capped payroll. The resulting amount of $27,299,000 is budgeted pursuant to the continuing appropriations process and deposited into the System in FY 2021.

Observations on Actuarial Funding and Statutory Funding

GASB Statements Nos. 25, 27, 67 and 68 provide guidance for retirement plans and plan sponsors on the development of an annual expense requirement to be reported in their annual financial statements. Under the rules established by previous GASB Statements Nos. 25 and 27, this expense requirement is called the Annual Required Contribution (ARC). The ARC is the sum of the normal cost and amortization of the unfunded accrued liability and represents the annual employer contributions that are projected to finance benefits for current plan members over a period not to exceed 30 years.

GASB Statements Nos. 67 and 68, which replaced GASB Statements Nos. 25 and 27, no longer use the ARC. However, measuring the Statutory Contribution against a policy such as the ARC helps evaluate the funding adequacy of the current Statutory funding method. Thus, the Board adopted a policy to calculate the Actuarial Determined Contribution (ADC). Under this funding policy, the ADC is calculated as the Normal Cost plus a 20-year level percent of capped payroll closed-period amortization, as of June 30, 2015, of the Unfunded Accrued Liability. The remaining amortization period as of the June 30, 2019, actuarial valuation is 16 years.

The ADC for fiscal years 2020 and 2021, as well as the statutory contribution for fiscal years 2020 and 2021 are shown below as a percentage of projected capped payroll. The ADC percentage and statutory contribution for 2020 are based on the results of the June 30, 2018, actuarial valuation. The dollar amount of the ADC for 2020 and 2021, and the statutory contribution for 2020 and 2021 will be the product of the actual payroll for 2020 and 2021 and the percentages shown.

Actuarial Valuation Date:	June 30, 2019	June 30, 2018
Actuarially Determined Contributions for Fiscal Year Ending:	**June 30, 2021**	**June 30, 2020**
1. Employer normal cost	$ 2,001,416	$ 2,506,923
2. Initial amount to amortize the unfunded liability over a 20-year closed-period, beginning July 1, 2015, as a level percentage of capped payroll	32,431,361	31,903,887
3. ADC [(1) + (2)]	$34,432,777	$34,410,810
4. Projected capped payroll for fiscal year	$ 9,820,850	$ 9,990,645
5. ADC as a percentage of projected capped payroll	350.609%	344.430%
6. Estimated statutory contribution	$27,299,000	$25,754,000
7. Estimated statutory contribution as a percentage of projected capped payroll	277.973%	257.780%
8. Estimated statutory contribution as a percentage of ADC [(6) / (3)]	79.282%	74.843%

A key objective of the ADC is to accrue costs over the working lifetime of plan members to ensure that benefit obligations are satisfied and intergenerational equity is promoted. Although the ADC is solely an accounting provision, in certain circumstances it could represent a reasonable annual funding target and therefore is used by some plan sponsors as their "de facto" funding requirement. Given there is no requirement that the accounting provision for pension expense must equal the annual funding requirement, some plan sponsors adopt funding policies that differ from the ADC. However, a funding policy that differs significantly from the ADC approach could result in a potential "back-loading,"

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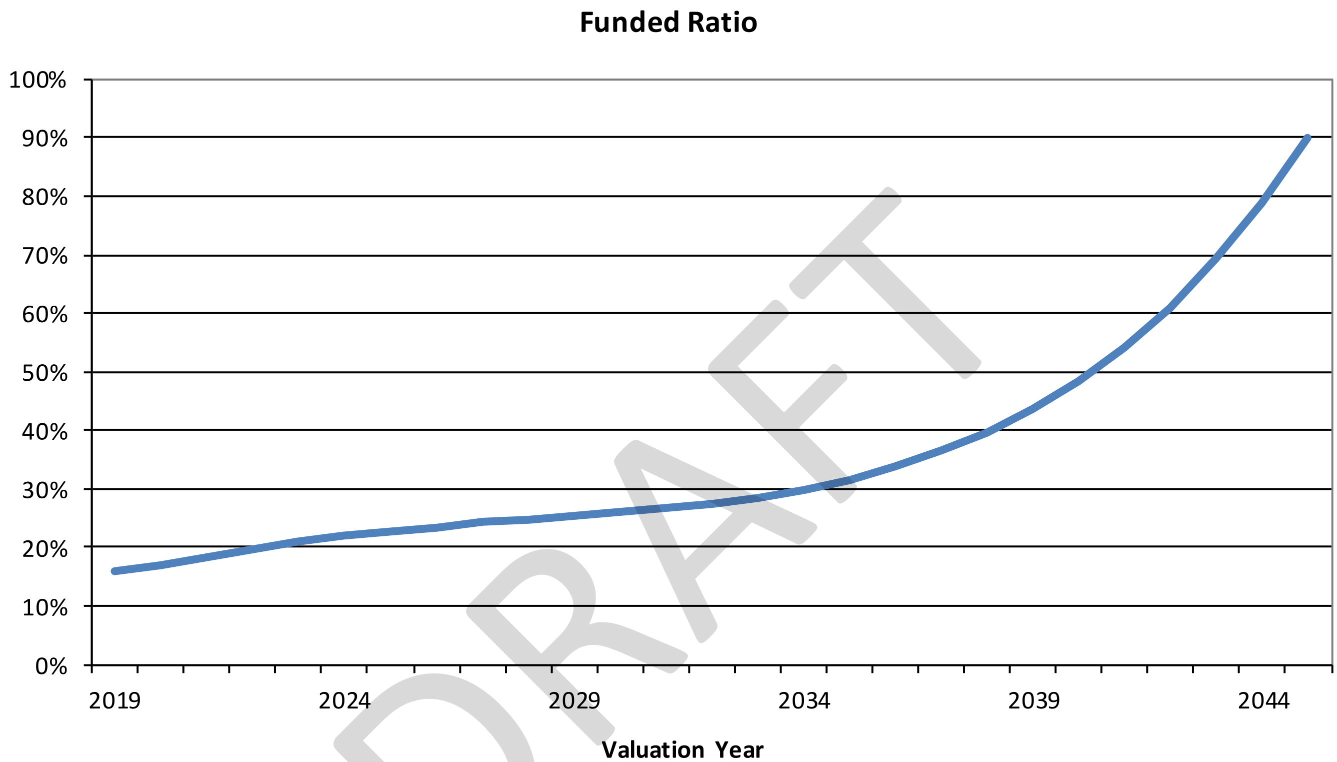
meaning contributions are deferred to the future. Back-loading could result in an underfunding of the system.

The statutory funding policy adopted for GARS provides for level percent of pay funding that produces a funding target of 90 percent by 2045, assuming an open group projection. The following graph shows the projected funded ratio. A key observation is that the funded ratio does not grow markedly until after 2033. That is, a majority of the funding occurs between 2034 and 2045. This illustrates how significantly the current funding policy defers or back-loads contributions into the future.



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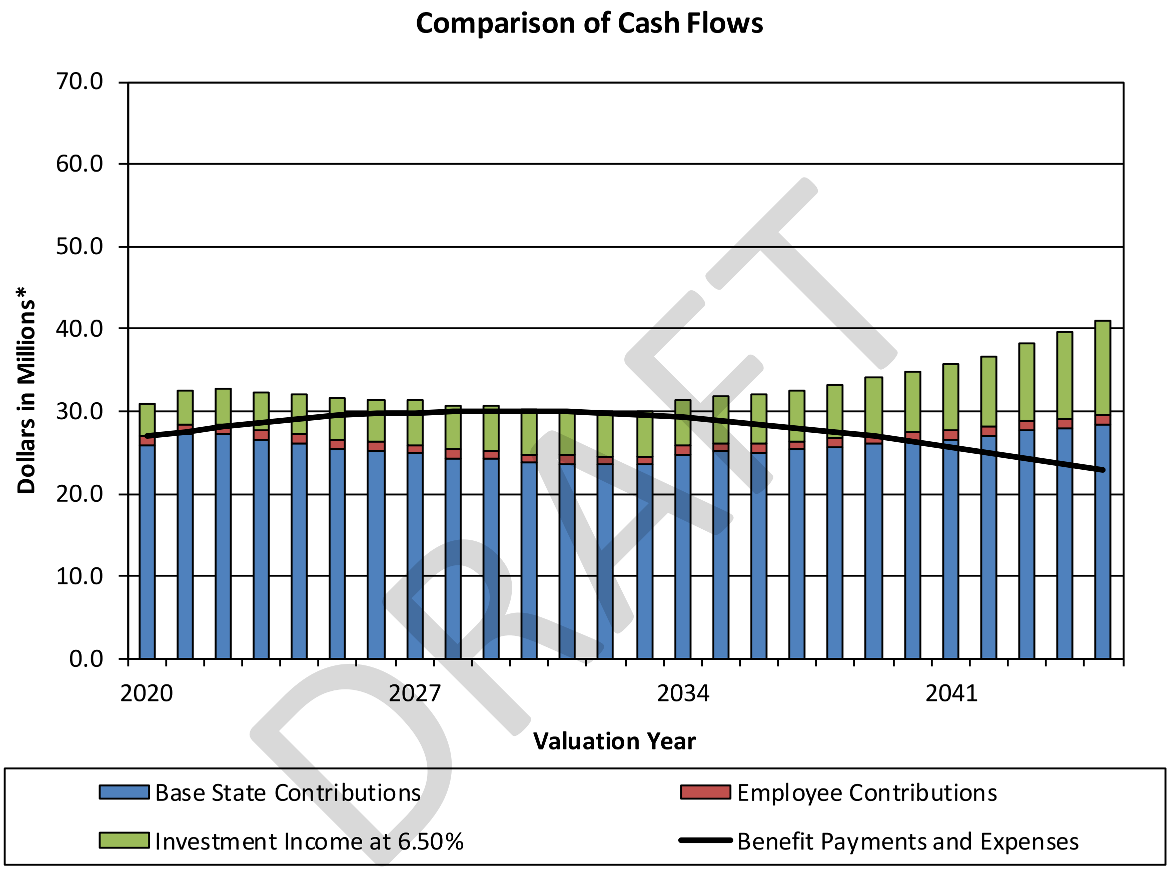
Observations on Actuarial Funding and Statutory Funding

The following graph compares the projected benefits and expenses against employer contributions, employee contributions and investment income. Benefits are projected to exceed State and employee contributions in fiscal years 2020, and 2023 through 2038. From 2023 to 2031, the percentage of investment income needed to pay ongoing benefits increases from approximately 22 percent to 97 percent. This implies that a lower level of investment income is projected to be available for potential asset growth. After 2031, the percentage of investment income needed to pay ongoing benefits is projected to decrease from approximately 94 percent in 2032 to 13 percent in 2038, which is projected to cause assets to grow at a higher rate.



**Future dollar amounts are based on assumed inflationary increases.*

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

Given that the GARS funded ratio at June 30, 2019, is only 16 percent on a market value of assets basis and because the current statutory policy tends to back-load and defer contributions, we advise strengthening the current statutory funding policy. Examples of methods to strengthen the current funding policy include:

1. Increasing the 90 percent funding target;
2. Reducing the projection period needed to reach the funding target;
3. Eliminating the maximum contribution cap; and,

4. Changing the actuarial cost method for calculating liabilities from the Projected Unit Credit to the Entry Age Normal method.

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

At the April 15, 2015, Board meeting, the Board adopted a policy, for purposes of financial reporting under GASB Statements Nos. 67 and 68, which provides for the annual financing of GARS' normal cost and amortizing the unfunded liability over 20 years as a level percent of capped payroll.

Number of Projected Future Active Members

The statutory contribution is based on performing an open group projection through the year 2045. The projection is based on assuming that new active members are hired to replace the current members who leave active membership (through termination, retirement or death). The number of active members has decreased by about 31 percent between 2008 and 2019, which is an average annualized decrease of about 3.24 percent.

Currently, the actuarial valuation assumes that 50 percent of future members will elect to opt out of the System. Given the decrease in the number of active members over the past 10 years, we recommend to continue to use the 50 percent opt out assumption and will reevaluate the opt out percentage during the next experience study.

Active Membership				
Fiscal Year Ending June 30,	Total	Annual Change in Membership	% Annual Change in Membership	Uncapped Payroll ($ in Millions)
2008	182			$14.21
2009	181	(1)	-0.55%	14.61
2010	182	1	0.55%	14.67
2011	180	(2)	-1.10%	14.46
2012	176	(4)	-2.22%	14.00
2013	160	(16)	-9.09%	12.95
2014	158	(2)	-1.25%	12.78
2015	145	(13)	-8.23%	11.61
2016	141	(4)	-2.76%	11.30
2017	135	(6)	-4.26%	11.00
2018	132	(3)	-2.22%	10.71
2019	126	(6)	-4.55%	10.16
Total Change		**(56)**	**-3.24%**	

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

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

1. The State contribution rate will be level as a percentage of payroll beginning in 2034 through 2045 (after all deferred asset gains and losses are fully recognized);
2. The unfunded liability will continue to decrease;
3. The unfunded actuarial accrued liabilities will never be fully amortized; and
4. The funded status of the plan will increase gradually towards a 90 percent funded ratio in 2045.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

1. The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
2. The measurement is dependent upon the actuarial cost method which, in combination with the plan's statutory funding policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100 percent is not synonymous with no required future contributions. If the funded status were 100 percent, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
3. The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets.

Limitation of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entity to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

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Risks Associated with Measuring the Accrued Liability and Total Required Employer Contribution

The determination of the accrued liability and the total required employer contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the total required employer contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Fund's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the Fund's future financial condition include:

1. Investment risk – actual investment returns may differ from the expected returns;
2. Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the Fund's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The statutory contribution for fiscal year 2021 shown on page 7 may be considered as a minimum contribution that complies with the funding policy governed by State statute. The timely receipt of the statutory contribution is critical to support the financial health of the Fund. Users of this report should be aware that contributions made at the statutorily determined amount do not necessarily guarantee benefit security.

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Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	2019	2018
Ratio of the Market Value of Assets to Uncapped Payroll	5.88	5.30
Ratio of Actuarial Accrued Liability to Uncapped Payroll	36.87	35.08
Ratio of Actives to Retirees and Beneficiaries	0.29	0.32
Ratio of Net Cash Flow to Market Value of Assets	-0.92%	-2.23%

Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 5.0 times the payroll, a return on assets 5 percent different than assumed would equal 25 percent of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100 percent is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 35 times the payroll, a change in liability 2 percent other than assumed would equal 70 percent of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

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Risks Associated with Measuring the Accrued Liability and Total Required Employer Contribution

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. At the Board's request, we conducted additional risk assessment of investment and contribution risk through stress testing the investment return assumption and future active population growth.

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SECTION B

FUNDING RESULTS

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Table 1
Results of Actuarial Valuation as of June 30, 2019

1	Number of Members		
	a. Active		126
	b. Inactive:		
	i. Eligible for deferred vested pension benefits		54
	ii. Eligible for return of contributions only		15
	c. Current Benefit Recipients:		
	i. Retirement annuities		323
	ii. Survivor annuities*		118
	iii. Reversionary annuities		-
	d. Total		636
2	Covered Uncapped Payroll	$	10,159,312
3	Annualized Benefit Payments Currently Being Made		
	a. Retirement	$	20,803,915
	b. Survivor*		4,206,097
	c. Reversionary		-
	d. Total	$	25,010,012
4	Actuarial Liability—Annuitants		
	a. Current Benefit Recipients:		
	i. Retirement annuities	$	264,116,924
	ii. Survivor annuities*		39,639,301
	b. Total	$	303,756,225

Includes 12 alternate payees resulting from QILDROs and 2 retired members also receiving a survivor annuity.

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Table 1 (continued)
Results of Actuarial Valuation as of June 30, 2019

5	Actuarial Liability—Inactive Members			$	29,275,022
			Normal Cost		Actuarial Liability
6	Active Members				
	a. Pension Benefits	$	1,644,385	$	27,378,827
	b. Cost-of-Living Adjustments		640,935		10,188,842
	c. Death Benefits		98,773		477,444
	d. Disability		-		-
	e. Withdrawal		370,797		3,520,899
	f. Expenses		395,450		-
	g. Total	$	3,150,340	$	41,566,012
7	Total Actuarial Liability (4 + 5 + 6)			$	374,597,259
8	Market Value of Assets (MVA)			$	59,719,220
9	Unfunded Actuarial Liability Based on MVA (7 – 8)			$	314,878,039
10	Funded Percentage Based on MVA (8 ÷ 7)				15.94%
11	Actuarial Value of Assets (AVA)			$	60,057,098
12	Unfunded Actuarial Liability Based on AVA (7 – 11)			$	314,540,161
13	Funded Percentage Based on AVA (11 ÷ 7) [a]				16.03%
14	Total Normal Cost	$	3,150,340		
15	Employee Contributions	$	1,148,924		
16	Annual Employer Normal Cost	$	2,001,416		
	(% uncapped payroll)		19.70%		

[a] The funded status measure is appropriate for assessing the need for future contributions. The funded status is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

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Table 2
Analysis of Change in Unfunded Accrued Actuarial Liability

In addition to the expected change in the unfunded accrued actuarial liability, changes in membership demographics and fund assets have affected the valuation results. The decrease in the unfunded accrued actuarial liability ("UAAL") of $3,620,279 was due to the following:

1	UAAL at 06/30/2018	$	318,160,441
2	Contributions		
	a. Contributions due (Normal Cost plus Interest on UAAL)		
	i interest on 1)	$	21,475,830
	ii members contributions		1,349,613
	iii employer normal cost		2,506,923
	iv interest on ii and iii		128,033
	v total due	$	25,460,399
	b. Contributions paid (Actual)		
	i member contributions	$	1,349,613
	ii state agencies		23,221,000
	iii interest on i and ii		815,718
	iv total paid	$	25,386,331
	c. Expected increase in UAAL	$	74,068
3	Expected UAAL at 06/30/2019	$	318,234,509
4	(Gains)/Losses		
	a. investment income	$	831,434
	b. demographic		4,258,425
	c. total	$	5,089,859
5	Plan Provision Changes	$	-
6	Assumption Changes	$	(8,784,207)
7	Total Change in UAAL	$	(3,620,280)
8	UAAL at 06/30/2019	$	314,540,161

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Table 3
Analysis of Financial Gains and Losses in Unfunded Accrued Actuarial Liability for Fiscal Year Ended June 30, 2019

	Activity		(Gain)/Loss	% of 06/30/2018 AAL
1	Actuarial (Gain)/Loss			
	a. Retirements	$	158,814	0.04%
	b. Incidence of Disability		-	0.00%
	c. In-Service Mortality		27,818	0.01%
	d. Retiree Mortality and Other		(884,400)	-0.24%
	e. Salary Increases		1,042,570	0.28%
	f. Terminations		2,070,296	0.55%
	g. Investment		831,434	0.22%
	h. New Entrant Liability		102,318	0.03%
	i. Data/Method Changes[a]		614,134	0.16%
	j. Other		1,126,875	0.30%
	k. Total Actuarial (Gain)/Loss	$	5,089,859	1.35%
2	Plan Provision Changes	$	-	0.00%
3	Assumption Changes	$	(8,784,207)	-2.34%
4	Contribution (Excess)/Shortfall[b]	$	74,068	0.02%
5	Total Financial (Gain)/Loss	$	(3,620,280)	-0.97%

[a] *The method for valuing liabilities resulting from QILDROs was updated to more accurately reflect data records.*

[b] *Represents the increase in the Unfunded Actuarial Accrued Liability due to actual contributions being less than the Normal Cost plus interest on the beginning of year Unfunded Actuarial Accrued Liability.*

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Table 4a
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% Each Year ($ in Millions)

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Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Annual Normal Cost: Total	Annual Normal Cost: Employee Cont.	Annual Normal Cost: Employer Normal Cost	Annual Normal Cost: Percent of Pay	State Contribution: Amount	State Contribution: Percent of Pay	Total Expenses
2020	120	$374.29	$19.50	$354.79	5.21%	$9.99	$ 3.15	$1.15	$2.00	20.02%	$29.50	295.25%	$27.04
2021	114	373.35	25.37	347.98	6.80%	9.82	3.00	1.13	1.87	19.04%	30.81	313.73%	27.48
2022	109	371.41	30.55	340.86	8.23%	9.56	2.84	1.10	1.74	18.20%	30.55	319.66%	28.23
2023	105	368.75	34.89	333.86	9.46%	9.37	2.68	1.08	1.60	17.08%	29.86	318.78%	28.65
2024	100	365.26	38.52	326.74	10.55%	9.25	2.53	1.06	1.47	15.89%	29.40	317.90%	29.14
2025	97	361.09	41.31	319.78	11.44%	9.03	2.42	1.04	1.38	15.28%	28.71	317.90%	29.48
2026	94	356.34	43.89	312.45	12.32%	8.99	2.36	1.03	1.33	14.79%	28.57	317.90%	29.70
2027	90	351.07	46.33	304.74	13.20%	8.93	2.28	1.03	1.25	14.00%	28.40	317.90%	29.83
2028	88	345.25	48.27	296.98	13.98%	8.78	2.20	1.01	1.19	13.55%	27.91	317.90%	29.96
2029	85	338.87	50.32	288.55	14.85%	8.81	2.14	1.01	1.13	12.83%	27.99	317.90%	30.06
2030	83	332.07	52.31	279.76	15.75%	8.73	2.07	1.00	1.07	12.26%	27.76	317.90%	30.00
2031	81	324.91	54.58	270.33	16.80%	8.74	2.03	1.01	1.02	11.67%	27.79	317.90%	29.89
2032	79	317.47	57.24	260.23	18.03%	8.75	2.00	1.01	0.99	11.31%	27.81	317.90%	29.68
2033	77	309.72	60.31	249.41	19.47%	8.75	1.97	1.01	0.96	10.97%	27.83	317.90%	29.47
2034	76	301.67	63.78	237.89	21.14%	8.75	1.95	1.01	0.94	10.74%	27.82	317.90%	29.25

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4a (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% Each Year ($ in Millions)

							Annual Normal Cost				State Contribution		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Amount	Percent of Pay	Total Expenses
2035	74	$293.47	$68.25	$225.22	23.26%	$8.86	$1.94	$1.02	$0.92	10.38%	$28.18	317.90%	$28.89
2036	73	285.16	73.43	211.73	25.75%	8.86	1.92	1.02	0.90	10.16%	28.16	317.90%	28.46
2037	72	276.74	79.79	196.95	28.83%	8.98	1.91	1.03	0.88	9.80%	28.53	317.90%	28.03
2038	71	268.25	87.42	180.83	32.59%	9.09	1.92	1.05	0.87	9.57%	28.90	317.90%	27.58
2039	70	259.84	96.56	163.28	37.16%	9.21	1.93	1.06	0.87	9.45%	29.26	317.90%	26.97
2040	69	251.48	107.27	144.21	42.66%	9.31	1.93	1.07	0.86	9.24%	29.61	317.90%	26.39
2041	68	243.29	119.73	123.56	49.21%	9.42	1.94	1.08	0.86	9.13%	29.96	317.90%	25.72
2042	68	235.29	134.09	101.20	56.99%	9.53	1.95	1.10	0.85	8.92%	30.30	317.90%	25.03
2043	67	227.54	150.98	76.56	66.35%	9.79	1.99	1.13	0.86	8.78%	31.12	317.90%	24.33
2044	66	220.10	170.13	49.97	77.30%	9.90	2.02	1.14	0.88	8.89%	31.47	317.90%	23.55
2045	66	212.96	191.66	21.30	90.00%	10.01	2.04	1.15	0.89	8.89%	31.82	317.90%	22.82

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

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Table 4b

Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023 Investment Return of 6.50% Each Year ($ in Millions)

							Annual Normal Cost				Required State Contribution						
											(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2020	120	$374.29	$63.82	$310.47	17.05%	$9.99	$3.15	$1.15	$2.00	20.02%	$29.50	$2.50	$27.00	$25.75	$25.75	257.78%	$27.04
2021	114	373.35	68.94	304.41	18.47%	9.82	3.00	1.13	1.87	19.04%	30.81	2.64	28.17	27.30	27.30	277.97%	27.48
2022	109	371.41	73.42	297.99	19.77%	9.56	2.84	1.10	1.74	18.20%	30.55	2.77	27.78	27.13	27.13	283.90%	28.23
2023	105	368.75	77.09	291.66	20.91%	9.37	2.68	1.08	1.60	17.08%	29.86	2.90	26.96	26.51	26.51	283.02%	28.65
2024	100	365.26	80.06	285.20	21.92%	9.25	2.53	1.06	1.47	15.89%	29.40	3.11	26.29	26.09	26.09	282.14%	29.14
2025	97	361.09	82.13	278.96	22.75%	9.03	2.42	1.04	1.38	15.28%	28.71	3.30	25.41	25.48	25.41	281.35%	29.48
2026	94	356.34	83.87	272.47	23.54%	8.99	2.36	1.03	1.33	14.79%	28.57	3.39	25.18	25.36	25.18	280.21%	29.70
2027	90	351.07	85.34	265.73	24.31%	8.93	2.28	1.03	1.25	14.00%	28.40	3.46	24.94	25.21	24.94	279.13%	29.83
2028	88	345.25	86.08	259.17	24.93%	8.78	2.20	1.01	1.19	13.55%	27.91	3.63	24.28	24.77	24.28	276.63%	29.96
2029	85	338.87	86.69	252.18	25.58%	8.81	2.14	1.01	1.13	12.83%	27.99	3.76	24.23	24.84	24.23	275.10%	30.06
2030	83	332.07	86.93	245.14	26.18%	8.73	2.07	1.00	1.07	12.26%	27.76	3.99	23.77	24.64	23.77	272.18%	30.00
2031	81	324.91	87.11	237.80	26.81%	8.74	2.03	1.01	1.02	11.67%	27.79	4.20	23.59	24.66	23.59	269.88%	29.89
2032	79	317.47	87.46	230.01	27.55%	8.75	2.00	1.01	0.99	11.31%	27.81	4.29	23.52	24.68	23.52	268.86%	29.68
2033	77	309.72	88.08	221.64	28.44%	8.75	1.97	1.01	0.96	10.97%	27.83	4.28	23.55	24.70	23.55	269.03%	29.47
2034	76	301.67	90.13	211.54	29.88%	8.75	1.95	1.01	0.94	10.74%	27.82	0.00	N/A	24.69	24.69	282.14%	29.25

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Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4b (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Investment Return of 6.50% Each Year ($ in Millions)

							Annual Normal Cost				Required State Contribution						
											(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2035	74	$293.47	$93.04	$200.43	31.70%	$8.86	$1.94	$1.02	$0.92	10.38%	$28.18	$0.00	N/A	$25.01	$25.01	282.14%	$28.89
2036	73	285.16	96.56	188.60	33.86%	8.86	1.92	1.02	0.90	10.16%	28.16	0.00	N/A	25.00	25.00	282.14%	28.46
2037	72	276.74	101.11	175.63	36.54%	8.98	1.91	1.03	0.88	9.80%	28.53	0.00	N/A	25.32	25.32	282.14%	28.03
2038	71	268.25	106.78	161.47	39.81%	9.09	1.92	1.05	0.87	9.57%	28.90	0.00	N/A	25.65	25.65	282.14%	27.58
2039	70	259.84	113.78	146.06	43.79%	9.21	1.93	1.06	0.87	9.45%	29.26	0.00	N/A	25.97	25.97	282.14%	26.97
2040	69	251.48	122.16	129.32	48.58%	9.31	1.93	1.07	0.86	9.24%	29.61	0.00	N/A	26.28	26.28	282.14%	26.39
2041	68	243.29	132.12	111.17	54.31%	9.42	1.94	1.08	0.86	9.13%	29.96	0.00	N/A	26.59	26.59	282.14%	25.72
2042	68	235.29	143.76	91.53	61.10%	9.53	1.95	1.10	0.85	8.92%	30.30	0.00	N/A	26.90	26.90	282.14%	25.03
2043	67	227.54	157.66	69.88	69.29%	9.79	1.99	1.13	0.86	8.78%	31.12	0.00	N/A	27.62	27.62	282.14%	24.33
2044	66	220.10	173.61	46.49	78.88%	9.90	2.02	1.14	0.88	8.89%	31.47	0.00	N/A	27.93	27.93	282.14%	23.55
2045	66	212.96	191.67	21.29	90.00%	10.01	2.04	1.15	0.89	8.89%	31.82	0.00	N/A	28.24	28.24	282.14%	22.82

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Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4c
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ in Millions)

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							Annual Normal Cost				State Contribution		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Amount	Percent of Pay	Total Expenses
2020	120	$374.29	$19.45	$354.84	5.20%	$9.99	$3.15	$1.15	$2.00	20.02%	$29.50	295.25%	$27.04
2021	114	373.35	25.34	348.01	6.79%	9.82	3.00	1.13	1.87	19.04%	30.82	313.78%	27.48
2022	109	371.41	30.51	340.90	8.21%	9.56	2.84	1.10	1.74	18.20%	30.56	319.71%	28.23
2023	105	368.75	34.84	333.91	9.45%	9.37	2.68	1.08	1.60	17.08%	29.86	318.83%	28.65
2024	100	365.26	38.47	326.79	10.53%	9.25	2.53	1.06	1.47	15.89%	29.40	317.95%	29.14
2025	97	361.09	41.25	319.84	11.42%	9.03	2.42	1.04	1.38	15.28%	28.71	317.95%	29.48
2026	94	356.34	43.84	312.50	12.30%	8.99	2.36	1.03	1.33	14.79%	28.57	317.95%	29.70
2027	90	351.07	46.28	304.79	13.18%	8.93	2.28	1.03	1.25	14.00%	28.41	317.95%	29.83
2028	88	345.25	48.22	297.03	13.97%	8.78	2.20	1.01	1.19	13.55%	27.91	317.95%	29.96
2029	85	338.87	50.27	288.60	14.83%	8.81	2.14	1.01	1.13	12.83%	28.00	317.95%	30.06
2030	83	332.07	52.27	279.80	15.74%	8.73	2.07	1.00	1.07	12.26%	27.76	317.95%	30.00
2031	81	324.91	54.53	270.38	16.78%	8.74	2.03	1.01	1.02	11.67%	27.79	317.95%	29.89
2032	79	317.47	57.20	260.27	18.02%	8.75	2.00	1.01	0.99	11.31%	27.82	317.95%	29.68
2033	77	309.72	60.26	249.46	19.46%	8.75	1.97	1.01	0.96	10.97%	27.83	317.95%	29.47
2034	76	301.67	63.74	237.93	21.13%	8.75	1.95	1.01	0.94	10.74%	27.82	317.95%	29.25

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4c (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Maximum Contribution Calculation: Without GOB Proceeds
Investment Return of 6.50% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ in Millions)

							Annual Normal Cost				State Contribution		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Amount	Percent of Pay	Total Expenses
2035	74	$293.47	$68.21	$225.26	23.24%	$8.86	$1.94	$1.02	$0.92	10.38%	$28.18	317.95%	$28.89
2036	73	285.16	73.40	211.76	25.74%	8.86	1.92	1.02	0.90	10.16%	28.17	317.95%	28.46
2037	72	276.74	79.76	196.98	28.82%	8.98	1.91	1.03	0.88	9.80%	28.54	317.95%	28.03
2038	71	268.25	87.39	180.86	32.58%	9.09	1.92	1.05	0.87	9.57%	28.91	317.95%	27.58
2039	70	259.84	96.53	163.31	37.15%	9.21	1.93	1.06	0.87	9.45%	29.27	317.95%	26.97
2040	69	251.48	107.24	144.24	42.64%	9.31	1.93	1.07	0.86	9.24%	29.62	317.95%	26.39
2041	68	243.29	119.71	123.58	49.20%	9.42	1.94	1.08	0.86	9.13%	29.96	317.95%	25.72
2042	68	235.29	134.07	101.22	56.98%	9.53	1.95	1.10	0.85	8.92%	30.31	317.95%	25.03
2043	67	227.54	150.96	76.58	66.34%	9.79	1.99	1.13	0.86	8.78%	31.12	317.95%	24.33
2044	66	220.10	170.12	49.98	77.29%	9.90	2.02	1.14	0.88	8.89%	31.48	317.95%	23.55
2045	66	212.96	191.66	21.30	90.00%	10.01	2.04	1.15	0.89	8.89%	31.82	317.95%	22.82

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

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Table 4d

Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023

Investment Return of 6.50% Each Year

Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ in Millions)

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							Annual Normal Cost				Required State Contribution						
											(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2020	120	$374.29	$63.27	$311.02	16.90%	$9.99	$3.15	$1.15	$2.00	20.02%	$29.50	$2.50	$27.00	$25.75	$25.75	257.78%	$27.04
2021	114	373.35	68.68	304.67	18.40%	9.82	3.00	1.13	1.87	19.04%	30.82	2.64	28.18	27.30	27.30	277.97%	27.48
2022	109	371.41	73.18	298.23	19.70%	9.56	2.84	1.10	1.74	18.20%	30.56	2.78	27.78	27.22	27.22	284.82%	28.23
2023	105	368.75	76.79	291.96	20.82%	9.37	2.68	1.08	1.60	17.08%	29.86	2.90	26.96	26.54	26.54	283.33%	28.65
2024	100	365.26	79.76	285.50	21.84%	9.25	2.53	1.06	1.47	15.89%	29.40	3.10	26.30	26.12	26.12	282.46%	29.14
2025	97	361.09	81.82	279.27	22.66%	9.03	2.42	1.04	1.38	15.28%	28.71	3.30	25.41	25.53	25.41	281.40%	29.48
2026	94	356.34	83.54	272.80	23.44%	8.99	2.36	1.03	1.33	14.79%	28.57	3.38	25.19	25.41	25.19	280.26%	29.70
2027	90	351.07	84.99	266.08	24.21%	8.93	2.28	1.03	1.25	14.00%	28.41	3.47	24.94	25.26	24.94	279.18%	29.83
2028	88	345.25	85.71	259.54	24.83%	8.78	2.20	1.01	1.19	13.55%	27.91	3.62	24.29	24.82	24.29	276.68%	29.96
2029	85	338.87	86.31	252.56	25.47%	8.81	2.14	1.01	1.13	12.83%	28.00	3.77	24.23	24.90	24.23	275.15%	30.06
2030	83	332.07	86.53	245.54	26.06%	8.73	2.07	1.00	1.07	12.26%	27.76	3.99	23.77	24.69	23.77	272.23%	30.00
2031	81	324.91	86.69	238.22	26.68%	8.74	2.03	1.01	1.02	11.67%	27.79	4.19	23.60	24.72	23.60	269.93%	29.89
2032	79	317.47	87.02	230.45	27.41%	8.75	2.00	1.01	0.99	11.31%	27.82	4.29	23.53	24.74	23.53	268.91%	29.68
2033	77	309.72	87.60	222.12	28.28%	8.75	1.97	1.01	0.96	10.97%	27.83	4.28	23.55	24.75	23.55	269.08%	29.47
2034	76	301.67	89.68	211.99	29.73%	8.75	1.95	1.01	0.94	10.74%	27.82	0.00	N/A	24.74	24.74	282.74%	29.25

Normal cost rate includes administrative expenses.
State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.
Total expenses shown include benefit payments, refunds and administrative expenses.
Actuarial accrued liability and assets are measured at Plan Year End.
Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

Table 4d (continued)
Baseline Projections — State Contributions Determined under Public Act 88-0593, Public Act 94-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023
Investment Return of 6.50% Each Year
Phase-In of Deferred Investment Gains and Losses Recognized in the Projected Actuarial Value of Assets ($ in Millions)

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							Annual Normal Cost				Required State Contribution						
											(a)	(b)	(c)=(a)-(b)	(d)	Minimum of (c) and (d)		
Plan Year End 6/30	Number Active	Actuarial Accrued Liability	Assets	Unfunded Liability	Funded Ratio	Total Payroll	Total	Employee Cont.	Employer Normal Cost	Percent of Pay	Without GOB Cont.	Debt Service	Maximum Cont.	Formula Rate With GOB	Required Cont.	Percent of Pay	Total Expenses
2035	74	$293.47	$92.62	$200.85	31.56%	$8.86	$1.94	$1.02	$0.92	10.38%	$28.18	$0.00	N/A	$25.06	$25.06	282.74%	$28.89
2036	73	285.16	96.17	188.99	33.72%	8.86	1.92	1.02	0.90	10.16%	28.17	0.00	N/A	25.05	25.05	282.74%	28.46
2037	72	276.74	100.75	175.99	36.41%	8.98	1.91	1.03	0.88	9.80%	28.54	0.00	N/A	25.38	25.38	282.74%	28.03
2038	71	268.25	106.44	161.81	39.68%	9.09	1.92	1.05	0.87	9.57%	28.91	0.00	N/A	25.71	25.71	282.74%	27.58
2039	70	259.84	113.48	146.36	43.67%	9.21	1.93	1.06	0.87	9.45%	29.27	0.00	N/A	26.03	26.03	282.74%	26.97
2040	69	251.48	121.90	129.58	48.47%	9.31	1.93	1.07	0.86	9.24%	29.62	0.00	N/A	26.34	26.34	282.74%	26.39
2041	68	243.29	131.90	111.39	54.22%	9.42	1.94	1.08	0.86	9.13%	29.96	0.00	N/A	26.64	26.64	282.74%	25.72
2042	68	235.29	143.59	91.70	61.03%	9.53	1.95	1.10	0.85	8.92%	30.31	0.00	N/A	26.95	26.95	282.74%	25.03
2043	67	227.54	157.54	70.00	69.24%	9.79	1.99	1.13	0.86	8.78%	31.12	0.00	N/A	27.68	27.68	282.74%	24.33
2044	66	220.10	173.54	46.56	78.85%	9.90	2.02	1.14	0.88	8.89%	31.48	0.00	N/A	27.99	27.99	282.74%	23.55
2045	66	212.96	191.65	21.31	90.00%	10.01	2.04	1.15	0.89	8.89%	31.82	0.00	N/A	28.30	28.30	282.74%	22.82

Normal cost rate includes administrative expenses.

State contribution based on the requirements of Public Act 88-0593, as amended by Public Act 90-0065, Public Act 93-0002, Public Act 94-0004, Public Act 96-0043 and Public Act 100-0023.

Total expenses shown include benefit payments, refunds and administrative expenses.

Actuarial accrued liability and assets are measured at Plan Year End.

Total payroll is capped for members hired after December 31, 2010, as defined in Public Act 96-0889.

SECTION C

FUND ASSETS

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Table 5
Statement of Fiduciary Net Position
for Years Ended June 30, 2019, and 2018

	2019	2018
Assets		
Cash	$ 4,144,035	$ 4,718,266
Receivables:		
Contributions:		
Participants	$ 70,197	$ 20,419
Employer - GRF Fund	967,540	651,300
Other accounts	11,839	13,016
	$ 1,049,576	$ 684,735
Investments - held in the Illinois State Board of Investment Commingled Fund at fair value	$ 54,604,432	$ 51,487,943
Securities lending collateral with State Treasurer	863,000	1,949,000
Capital assets, net of accumulated depreciation	$ 31,952	$ 22,615
Total Assets	$ 60,692,995	$ 58,862,559
Liabilities		
Benefits payable	$ -	$ -
Refunds payable	-	214
Administrative expenses payable	37,774	34,394
Participants' deferred service credit accounts	-	-
Due to Judges' Retirement System of Illinois	73,001	62,567
Securities lending collateral with State Treasurer	863,000	1,949,000
Total Liabilities	$ 973,775	$ 2,046,175
Net assets held in trust for pension benefits	$ 59,719,220	$ 56,816,384

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Table 6
Statement of Changes in Fiduciary Net Position
for Years Ended June 30, 2019, and 2018

	2019	2018
Additions:		
Contributions:		
Participants	$ 1,349,613	$ 1,255,232
Employing state agencies and appropriations	23,221,000	21,155,000
Total Contributions revenue	$ 24,570,613	$ 22,410,232
Investments income:		
Net investment income	$ 807,117	$ 1,029,179
Interest earned on cash balances	72,927	93,666
Net appreciation in fair value of investments	2,569,372	2,610,659
Total Investments income	$ 3,449,416	$ 3,733,504
Other:		
Miscellaneous	$ -	$ -
Total Investments income	$ -	$ -
Total Additions	$ 28,020,029	$ 26,143,736
Deductions:		
Benefits:		
Retirement annuities	$ 20,590,350	$ 19,188,301
Survivors' annuities	3,968,090	4,094,719
Disability benefits	-	-
Lump-sum benefits	-	-
Total Benefits	$ 24,558,440	$ 23,283,020
Refunds	168,920	44,856
Administrative	389,833	348,384
Total Deductions	$ 25,117,193	$ 23,676,260
Net increase	$ 2,902,836	$ 2,467,476
Net assets held in trust for pension benefits:		
Beginning of year	$ 56,816,384	$ 54,348,908
End of year	$ 59,719,220	$ 56,816,384

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

Year Ending June 30	2019	2020	2021	2022	2023
Beginning of Year:					
(1) Market Value of Assets	$ 56,816,384				
(2) Actuarial Value of Assets	57,618,152				
End of Year:					
(3) Market Value of Assets	59,719,220				
(4) Contributions and Disbursements					
(4a) Actual State Contribution Amount	23,221,000				
(4b) Employee Contribution Amount	1,349,613				
(4c) Benefit Payouts & Refunds	(24,727,360)				
(4d) Administrative Expenses	(389,833)				
(4e) Net of Contributions and Disbursements	(546,580)				
(5) Total Investment Income					
=(3)-(1)-(4e)	3,449,416				
(6) Projected Rate of Return	6.75%				
(7) Projected Investment Income					
=(1)x(6)+([1+(6)]^.5-1)x(4e)	3,816,960				
(8) Investment Income in					
Excess of Projected Income	(367,544)				
(9) Excess Investment Income Recognized					
This Year (5-year recognition)					
(9a) From This Year	$ (73,509)				
(9b) From One Year Ago	21,397	$ (73,509)			
(9c) From Two Years Ago	364,807	21,397	$ (73,509)		
(9d) From Three Years Ago	(837,650)	364,807	21,397	$ (73,509)	
(9e) From Four Years Ago	(306,479)	(837,648)	364,809	21,395	$ (73,508)
(9f) Total Recognized Investment Gain	(831,434)	(524,953)	312,697	(52,114)	(73,508)
(10) Change in Actuarial Value of Assets					
=(4e)+(7)+(9f)	$ 2,438,946				
End of Year:					
(3) Market Value of Assets	**$ 59,719,220**				
(11) Actuarial Value of Assets					
=(2)+(10)	**$ 60,057,098**				

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

Year Ending June 30	2019	2020	2021	2022	2023
Beginning of Year:					
(1) Hypothetical Value of Assets	$ 10,951,778				
(2) Hypothetical Actuarial Value of Assets	11,024,482				
End of Year:					
(3) Hypothetical Value of Assets	14,768,743				
(4) Contributions and Disbursements					
(4a) State Contribution Amount[a]	26,824,627				
(4b) Employee Contribution Amount	1,349,613				
(4c) Benefit Payouts & Refunds	(24,727,360)				
(4d) Administrative Expenses	(389,833)				
(4e) Net of Contributions and Disbursements	3,057,047				
(5) Total Investment Income[b]					
=(3)-(1)-(4e)	759,918				
(6) Projected Rate of Return	6.75%				
(7) Projected Investment Income					
=(1)x(6)+([1+(6)]^.5-1)x(4e)	840,736				
(8) Investment Income in					
Excess of Projected Income	(80,818)				
(9) Excess Investment Income Recognized					
This Year (5-year recognition)					
(9a) From This Year	$ (16,164)				
(9b) From One Year Ago	3,650	$ (16,164)			
(9c) From Two Years Ago	41,463	3,650	$ (16,164)		
(9d) From Three Years Ago	(84,873)	41,463	3,650	$ (16,164)	
(9e) From Four Years Ago	(41,946)	(84,871)	41,461	3,649	$ (16,162)
(9f) Total Recognized Investment Gain	(97,870)	(55,922)	28,947	(12,515)	(16,162)
(10) Change in Hypothetical Actuarial Value of Assets					
=(4e)+(7)+(9f)	$ 3,799,913				
End of Year:					
(3) Hypothetical Market Value of Assets	**$ 14,768,743**				
(11) Hypothetical Actuarial Value of Assets					
=(2)+(10)	**$ 14,824,395**				

[a] *Represents FY 2018 no POB basic contribution. This amount was determined as part of the June 30, 2016, valuation and is based upon the hypothetical asset value which assumes no infusion from the proceeds of the GOB sale that were deposited July 1, 2003.*

[b] *Investment income assumes hypothetical value of assets earns the Fund's actual rate of return for fiscal year 2018 of 6.95 percent.*

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SECTION D

PARTICIPANT DATA

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Table 9
Active Age and Service Distribution as of June 30, 2019

Age Group	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Up	Total	Percentage of Total
	Years of Service										
Under 20											
20-24											
25-29	2	1								3	2%
30-34	6	2	2							10	8%
35-39	6	3	3	1						13	10%
40-44	3	2	4	2						11	9%
45-49	3	6	6	5	2					22	17%
50-54	2	3	7	2	2	2				18	15%
55-59	1	2	8	2	3	3	2			21	17%
60-64		2	4	4	1	1	1			13	10%
65-69	1		3	1	2		1			8	6%
70 & Over	1			1		3			2	7	6%
Total	25	21	37	18	10	9	4		2	126	100%
Percentage of Total	20%	17%	30%	14%	7%	7%	3%		2%	100%	

Based on data received from the System, of the 126 active members, 43 were classified as "Single," 71 classified as "Married" and 12 were classified as "Unknown." We assume 75 percent are married and elect survivor benefits when they retire.

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Table 10

Retirees and Beneficiaries by Type of Benefit Being Paid as of June 30, 2019

Type of Benefit Being Paid	Count		Monthly Payment		Annual Payment		Average Annual Payment
Retirement Annuity	323	$	1,733,660	$	20,803,915	$	64,408
Survivor's Annuity	106	$	327,281	$	3,927,368	$	37,051
QILDRO	12	$	23,227	$	278,729	$	23,227
Total	**441**	**$**	**2,084,168**	**$**	**25,010,012**	**$**	**56,712**

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SECTION E

ACTUARIAL METHODS AND ASSUMPTIONS

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Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2019, Actuarial Valuation)

Actuarial Cost Method as Mandated by 40 ILCS 5/2-124, Adopted June 30, 1989

The projected unit credit normal cost method is used. Under this method, the projected pension at retirement age is first calculated and the present value at the individual member's current or attained age is determined. The normal cost for the member for the current year is equal to actuarial present value divided by the member's projected service at retirement. The normal cost for the plan for the year is the sum of the individual normal costs.

The actuarial accrued liability at any point in time is the present value of the projected pensions at that time less the value of future normal costs.

For ancillary benefits for active members, in particular death and survivor benefits, termination benefits, and the postretirement increases, the same procedure as outlined above is followed.

Estimated annual administrative expenses are added to the normal cost.

For actuarial valuation purposes, as well as projection purposes, an actuarial value of assets is used.

Most Actuarial Assumptions Adopted June 30, 2019

Actuarial assumptions are set by the Board of Trustees. Additional information regarding the rationale for the assumptions may be found in the experience review of the General Assembly Retirement System for the three-year period ending June 30, 2018. All actuarial assumptions are expectations of future experience, not market measures.

Mortality

Post-Retirement Mortality

Pub-2010 Above-Median Income General Healthy Retiree Mortality tables, sex distinct, with scaling factors of 99 percent for males and females, and the MP-2018 two-dimensional generational mortality improvement scale. This assumption provides a margin for future mortality improvements.

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

Pub-2010 Above-Median Income General Employee Mortality tables, sex distinct, with no scaling factors, and the MP-2018 two-dimensional generational mortality improvement scale. This assumption provides a margin for future mortality improvements.

Future mortality improvements are reflected by projecting the base mortality tables forward from the year 2010 using the MP-2018 projection scale.

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Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2019, Actuarial Valuation)

Interest

6.50 percent per annum, compounded annually.

General Inflation

2.25 percent per annum, compounded annually.

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

Marriage Assumption

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

Termination

Rates of withdrawal are assumed to be equal to six percent 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.

Salary Increases

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

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Load for Inactive Members Eligible for Deferred Vested Pension Benefits

Deferred vested liability is increased by 10 percent to account for increases in final average salary due to participation in a reciprocal system. This assumption was developed based on the average increase in actuarial liability due to reciprocal salary increases of inactive members over the period July 1, 2013, to June 30, 2018, and will be reviewed during the next experience study. Below is the analysis used to develop this assumption:

Impact of Reciprocal Salary Increases of Inactive Members			
Valuation Date	Estimated Benefits of Inactive Members who Retired During Year	Actual Benefits of Inactive Members who Retired during Year	Increase in Benefits
6/30/2013	$ 243,726	$ 257,156	5.5%
6/30/2014	122,961	137,838	12.1%
6/30/2015	97,204	106,026	9.1%
6/30/2016	181,647	190,816	5.0%
6/30/2017	118,439	122,802	3.7%
6/30/2018	160,213	199,518	24.5%
Total	$ 924,190	$ 1,014,157	
		Geometric Average	9.8%

Disability

No assumption for disability was used.

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Population Projection

For purposes of determining the annual appropriation as a percent of total covered payroll, the size of the active group is projected to decrease from 126 members as of the valuation date, to 66 members in 2045, and ultimately reach 63 members in 2054, due to the assumption that 50 percent of future members will elect to opt out of the pension system. New entrants are assumed to enter with an average age and average pay as disclosed below. The new entrant profile is based on the averages for all current active members. New entrant pay is assumed to increase by the salary scale assumption, and is limited by the projected statutory salary cap.

New Entrant Profile			
Age Group	No.	Uncapped Salary	Capped Salary
Under 20			
20-24			
25-29	10	$ 837,494	$ 837,494
30-34	16	1,443,784	1,417,540
35-39	18	1,464,509	1,464,509
40-44	18	1,444,003	1,410,009
45-49	15	1,291,178	1,257,184
50-54	13	1,104,590	1,091,468
55-59	11	867,528	867,528
60-64			
65-69			
70 & Over			
Total	**101**	**$ 8,453,086**	**$ 8,345,732**
Avg. Salary		**$ 83,694**	**$ 82,631**
Avg. Age			**41.85**
Percent Male			**64.36%**

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Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2019, Actuarial Valuation)

Retirement

Employees are assumed to retire in accordance with the rates shown below. The rates apply only to employees who have fulfilled the service requirement necessary for retirement at any given age.

Retirement Rates	
Age	**Males & Females**
55	5.00%
56-64	15.00%
65-74	20.00%
75	100.00%

Assets

Assets available for benefits are determined as shown on page 31. The asset valuation method is prescribed by statute, and does not appear to allow a corridor; therefore, a corridor has not been established.

Expenses

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

Spouse's Age

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

Decrement Timing

All decrements are assumed to occur beginning of year.

Decrement Relativity

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

Decrement Operation

Turnover decrements do not operate after member reaches retirement eligibility.

Eligibility Testing

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

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Actuarial Methods and Assumptions (Most Adopted Effective with the June 30, 2019, Actuarial Valuation)

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

No explicit assumption is made with respect to these items.

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

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

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

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

Retirement Rates for Tier Two Members	
Age	**Male & Female**
67	35.00%
68-70	25.00%
71-74	20.00%
75	100.00%
Early Retirement Rates for Tier Two Members	
Age	**Males and Females**
62	20.00%
63	10.00%
64	12.00%
65	14.00%
66	16.00%

Rates of withdrawal for Tier Two members are assumed to be equal to six percent for all ages 20 through 65.

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

State Contributions under P.A. 93-0002

In general, for each year during the life of the GOB program, the state contributions to the System are to be calculated as follows:

1. Calculation of the contribution maximum
   a. A projection of contributions will be made from the valuation date to June 30, 2045. Such projection will be based on hypothetical asset values determined using the following assumptions:
      i) That the System had received no portion of the general obligation bond proceeds in excess of the scheduled contributions for the remainder of fiscal 2003 and for the entirety of 2004,
      ii) That hypothetical state contributions had been made each fiscal year from 2005 through the valuation date, based on the funding process in place prior to P.A. 93-0002 (without regard to prior state minimum requirements),
      iii) That the actual amounts of member contributions and the actual cash outflows (benefit payments, refunds and administrative expenses) for each year prior to the valuation date were realized, and
      iv) That the hypothetical fund earned returns in each prior fiscal year equal to the rate of total return actually earned by the retirement fund in that year.
   b. The hypothetical asset values developed in a., above, will not exceed the actual assets of the fund.
   c. A projection of maximum contributions for each year of the GOB program will be performed each year, by reducing the contributions produced in a., above, by the respective amount of debt service allocated to the System for each year.
2. Calculation of the contribution with GOB proceeds
   a. The basic projection of State contributions from the valuation date through June 30, 2045, will be made, taking into account all assets of the System, including the GOB proceeds.
   b. State contribution rates (expressed as a percentage of covered pay), in the pattern required by the funding sections of the statutes, are calculated.
   c. In those projections, the dollars of state contributions which are added to assets each year during the GOB program are limited by the contribution maximum. Because the bonds are to be liquidated by the end of fiscal 2033, there is no contribution maximum thereafter.

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

State Contributions under P.A. 94-0004

The following is an excerpt from the Illinois Compiled statutes 40 ILCS 5/2-124:

> (c) Notwithstanding any other provision of this Article, the total State contribution for fiscal year 2006 is $4,157,000.
>
> Notwithstanding any other provision of this Article, the total State contribution for fiscal year 2007 is $5,220,300.
>
> For each State fiscal years 2008 through 2010, the State contribution to the System, as a percentage of the applicable payroll, shall be increased in equal annual increments from the required State contribution for State fiscal year 2007, so that by State fiscal year 2011, the State is contributing at a rate otherwise required under this Section.

State Contributions under P.A. 96-0043

The following is an excerpt from the Illinois Compiled statutes 40 ILCS 5/2-124:

> (d) For purposes of determining the required State contribution to the System, the value of the System's assets shall be equal to the actuarial value of the System's assets, which shall be calculated as follows:
>
>> As of June 30, 2008, the actuarial value of the System's assets shall be equal to the market value of the assets as of that date. In determining the actuarial value of the System's assets for fiscal years after June 30, 2008, any actuarial gains or losses from investment return incurred in a fiscal year shall be recognized in equal annual amounts over the five-year period following that fiscal year.
>
> (e) For purposes of determining the required State contribution to the system for a particular year, the actuarial value of assets shall be assumed to earn a rate of return equal to the system's actuarially assumed rate of return.

State Contributions under P.A. 100-0023

Public Act ("P.A.") 100-0023, effective July 6, 2017, modified the State's funding policy to include smoothing State contribution rate increases or decreases due to changes in actuarial assumptions, including investment return assumptions, over a five-year period in equal annual amounts beginning in fiscal year 2018. In addition, changes in actuarial or investment assumptions that increased or decreased the State contribution rate in fiscal years 2014 through 2017 are to be smoothed over a five-year period in equal annual amounts, applying only to the portion of the five-year phase-in that is applicable to fiscal years on and after 2018.

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Phase-in of the Financial Impact of Assumption Changes

Following is a table with the recognition schedule for the phase-in of actuarial assumption changes required under Public Act 100-0023. The following actuarial assumption changes were made:

1. Beginning with the June 30, 2013, actuarial valuation, there were changes to the economic and demographic assumptions.
2. Beginning with the June 30, 2015, actuarial valuation, there were changes to the new entrant population assumptions.
3. Beginning with the June 30, 2016, actuarial valuation, there were changes to the economic and demographic assumptions.
4. Beginning with the June 30, 2018, actuarial valuation, there were changes to the economic assumptions.
5. Beginning with the June 30, 2019, actuarial valuation, there were changes to the economic and demographic assumptions.

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$ in Millions
After Impact of GOB Proceeds

Valuation Year Ending June 30,	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Applicable Fiscal Year Ending June 30,	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Contribution Before Assumption Change											
(1) Contribution Dollar	$ 14.562	$ -	$ 16.207	$ 23.261	$ -	$ 25.578	$ 27.643				
(2) Contribution Rate	108.440%	0.000%	140.241%	221.533%	0.000%	255.977%	282.677%				
Contribution After Assumption Change											
(3) Contribution Dollar	$ 15.809	$ -	$ 21.721	$ 26.679	$ -	$ 26.088	$ 26.825				
(4) Contribution Rate	122.168%	0.000%	194.949%	255.539%	0.000%	261.122%	273.142%				
(5) Assumption Change Impact as a Percentage of Capped Payroll [(4) - (2)]	13.728%	0.000%	54.708%	34.006%	0.000%	5.145%	-9.535%				
(6) Assumption Change Impact Recognized This Year (5-year Recognition)											
(6a) From This Year	2.746%	0.000%	10.942%	6.801%	0.000%	1.029%	-1.907%				
(6b) From One Year Ago	0.000%	2.746%	0.000%	10.942%	6.801%	0.000%	1.029%	-1.907%			
(6c) From Two Years Ago	0.000%	0.000%	2.746%	0.000%	10.942%	6.801%	0.000%	1.029%	-1.907%		
(6d) From Three Years Ago	0.000%	0.000%	0.000%	2.746%	0.000%	10.942%	6.801%	0.000%	1.029%	-1.907%	
(6e) From Four Years Ago	0.000%	0.000%	0.000%	0.000%	2.744%	0.000%	10.940%	6.802%	0.000%	1.029%	-1.907%
(6f) Total Recognized Assumption Change Impact	2.746%	2.746%	13.688%	20.489%	20.487%	18.772%	16.863%	5.924%	-0.878%	-0.878%	-1.907%

SECTION F

SUMMARY OF PLAN PROVISIONS

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Summary of Plan Provisions
(as of June 30, 2019)

1. Participation. A person eligible for membership must participate in the system as a condition of employment unless an "Election Not to Participate" is filed within 24 months from the date of assuming office.

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

Retirement Annuity	8.5%
Automatic Annuity Increase	1.0
Survivor's Annuity	2.0
Total	11.5%

3. Retirement Annuity – Eligibility. A member who has at least eight years of creditable service is entitled to a retirement annuity upon attainment of age 55. A member with at least four years of service but less than eight years of service is entitled to a retirement annuity upon attainment of age 62.

   A member with at least eight years of service who becomes disabled while in service is entitled to a retirement annuity regardless of age.

4. Retirement Annuity – Amount. The retirement annuity is determined according to the following formula based upon the member's final rate of salary:

   - 3.0% for each of the first 4 years of service, plus
   - 3.5% for each of the next 2 years of service, plus
   - 4.0% for each of the next 2 years of service, plus
   - 4.5% for each of the next 4 years of service, plus
   - 5.0% for each year of service in excess of 12

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

5. Automatic Increase in Retirement Annuity.

   (a) Annual automatic increases of 3% of the current amount of retirement annuity are provided. The initial increase is effective in the month of January or July of the year next following the year in which the first anniversary of retirement occurs, but in no event prior to attainment of age 60.

   (b) Beginning January 1, 1990, for persons who become participants prior to August 8, 2003, and who remain in service after attaining 20 years of creditable service, 3% annual automatic increases begin to accrue on January 1 next following the date the participant attains age 55 or completes 20 years of creditable service, whichever occurs later. For any person who has service credit for the entire period from January 15, 1969 through December 31, 1992, the increases shall accrue from age 50 instead of age 55. However, such increases shall not become payable until the January 1 or July 1 next following the first anniversary of retirement, or the first of the month following attainment of age 60, whichever occurs later.

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

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

   An unmarried eligible child under age 18 or under age 22 and a full-time student or over age 18 and disabled may qualify for the survivor's annuity if there is no surviving spouse or if the spouse dies. Legally adopted children are eligible for survivor benefits on the same basis as other children.

   If the member dies in service as a member, the member must have at least two years of service credit for survivor's annuity eligibility. If death occurs after termination of service but before retirement, the deceased member must have at least four years of service credit for survivor's annuity eligibility.

7. Survivor's Annuity – Amount.

   (a) A surviving spouse is entitled to a survivor's annuity of 66 2/3% of the amount of retirement annuity to which the member was entitled on the date of death, without regard to whether the member had attained age 55 as of the time of death, subject to a minimum payment of 10% of salary.

   (b) If a surviving spouse has in his or her care eligible children, the survivor's annuity shall be the greater of the following:

      (1) 66 2/3% of the amount of retirement annuity to which the member was entitled on the date of death, or (2) 30% of the member's salary increased by 10% of salary on account of each eligible child, subject to a total payment for the surviving spouse and children of 50% of salary. If only unmarried children survive, each such child shall be entitled to an annuity of 20% of salary, subject to a maximum total payment for all children of 50% of salary.

   (c) Upon the death of a member after termination of service, or upon the death of an annuitant, the maximum total payment to a surviving spouse and eligible children, or eligible children alone if there is no surviving spouse, shall be 75% of the retirement annuity to which the member or annuitant was entitled.

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

   (e) The minimum survivor's annuity provided by the system is $300 per month.

   (f) In the case of a proportional survivor's annuity under the Retirement Systems Reciprocal Act, if the amount payable by the system on January 1, 1993, is less than $300 per month, the amount shall be increased as of that date by $2 per month for each full year elapsed since the the annuity began.

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8. Refund of Contributions. Upon termination of service, a member is entitled to a refund of his total contributions without interest.

   A member who has no eligible survivor's annuity beneficiaries, or is unmarried at the time of retirement, is entitled to a refund of his or her contributions for the survivor's annuity.

9. Retirement System Reciprocal Act. According to the provisions of the Retirement System Reciprocal Act provided in Illinois Compiled statutes 40 ILCS 5/20, a member who has pension credit in two or more participating systems may be entitled to a proportional retirement annuity if his or her combined pension credit satisfies the longest minimum retirement eligibility requirement of any such system.

   In calculating the proportional retirement annuity, the earnings credits under all participating systems shall be considered in determining final average salary.

<u>Persons Who First Become Participants On or After January 1, 2011 (“Tier 2”)</u>

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

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

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

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

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

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

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

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7. Automatic annual increases are provided in the survivor annuity then being paid equal to 3% or the annual change in the Consumer Price Index for all Urban Consumers, whichever is less. Such increases are payable (1) on each January 1 occurring on or after the commencement of the annuity if the deceased member died while receiving a retirement annuity, or (2) in other cases, on each January 1 occurring on or after the first anniversary of the commencement of the annuity.

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

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

Year Ending	CPI-U	COLA	Maximum Annual Pensionable Earnings
2011		3.00%	$106,800.00
2012	3.90%	3.00%	$110,004.00
2013	2.00%	2.00%	$112,204.08
2014	1.20%	1.20%	$113,550.53
2015	1.70%	1.70%	$115,480.89
2016	0.00%	0.00%	$115,480.89
2017	1.50%	1.50%	$117,213.10
2018	2.20%	2.20%	$119,791.79
2019	2.30%	2.30%	$122,547.00

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SECTION G

GLOSSARY OF TERMS

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Glossary of Terms

Actuarial Accrued Liability ("AAL")	The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs.
Actuarial Assumptions	Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items.
Actuarial Cost Method	A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability.
Actuarial Equivalent	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value ("APV")	The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made.
Actuarial Present Value of Future Benefits ("APVFB")	The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB No. 67, such as the Funded Ratio and the Actuarially Determined Contribution ("ADC").
Actuarial Value of Assets	The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio or contribution requirement.

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Glossary of Terms

Actuarially Determined Contribution ("ADC") The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ADC consists of the Employer Normal Cost and Amortization Payment.

Amortization Method A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase.

Amortization Payment That portion of the plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Amortization Period The period used in calculating the Amortization Payment.

Closed Amortization Period A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc.

Employer Normal Cost The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.

Equivalent Single Amortization Period For plans that do not establish separate amortization bases (separate components of the UAAL), this is the same as the Amortization Period. For plans that do establish separate amortization bases, this is the period over which the UAAL would be amortized if all amortization bases were combined upon the current UAAL payment.

Experience Gain/Loss A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two actuarial valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience; e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable

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	experience; i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected.
Funded Ratio	The ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability.
GASB	Governmental Accounting Standards Board.
GASB No. 67 and GASB No. 68	These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68, which replaced Statement No. 27 effective with fiscal year ending June 30, 2015, sets the accounting rules for the employers that sponsor or contribute to public retirement systems. Statement No. 67, which replaced Statement No. 25 effective with fiscal year ending June 30, 2014, sets the rules for the systems themselves.
Normal Cost	The annual cost assigned, under the Actuarial Cost Method, to the current plan year.
Open Amortization Period	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.
Unfunded Actuarial Accrued Liability	The difference between the Actuarial Accrued Liability and Actuarial Value of Assets.
Valuation Date	The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date.

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SECTION H

ADDITIONAL PROJECTION DETAILS

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Table 11
Additional Projection Details — Actuarial Accrued Liability
($ in Millions)

Valuation Date June 30	Current Inactives: Retirees & Beneficiaries	Current Inactives: Deferreds	Current Actives: Tier 1	Current Actives: Current Tier 2	Current Actives: Future Tier 2	Grand Totals: Current Retirees, Beneficiaries & Deferreds	Grand Totals: Actives	Grand Totals: Total
2019	$ 303.76	$ 29.28	$ 37.73	$ 3.84	$ -	$ 333.03	$ 41.57	$ 374.60
2020	297.67	30.12	41.68	4.82	0.00	327.79	46.50	374.29
2021	291.08	31.07	45.24	5.89	0.07	322.15	51.19	373.35
2022	284.02	31.73	48.47	6.99	0.19	315.75	55.66	371.41
2023	276.51	32.33	51.41	8.12	0.38	308.83	59.92	368.75
2024	268.56	32.81	53.99	9.27	0.64	301.36	63.90	365.26
2025	260.19	33.19	56.28	10.45	0.97	293.39	67.70	361.09
2026	251.44	33.50	58.36	11.67	1.38	284.94	71.41	356.34
2027	242.32	33.72	60.23	12.94	1.86	276.05	75.03	351.07
2028	232.89	33.90	61.82	14.22	2.42	266.79	78.46	345.25
2029	223.16	34.04	63.10	15.48	3.08	257.20	81.67	338.87
2030	213.20	34.15	64.13	16.76	3.84	247.34	84.73	332.07
2031	203.03	34.18	64.95	18.03	4.72	237.21	87.70	324.91
2032	192.72	34.17	65.56	19.31	5.71	226.89	90.58	317.47
2033	182.30	34.05	65.98	20.57	6.81	216.35	93.36	309.72
2034	171.85	33.85	66.16	21.80	8.03	205.69	95.98	301.67
2035	161.39	33.59	66.15	22.97	9.37	194.99	98.48	293.47
2036	151.01	33.29	65.98	24.06	10.82	184.30	100.86	285.16
2037	140.74	32.93	65.57	25.09	12.40	173.68	103.06	276.74
2038	130.66	32.52	64.95	26.01	14.11	163.18	105.07	268.25
2039	120.80	32.06	64.16	26.88	15.95	152.85	106.98	259.84
2040	111.21	31.54	63.20	27.63	17.91	142.75	108.73	251.48
2041	101.96	30.95	62.09	28.31	19.99	132.91	110.38	243.29
2042	93.07	30.30	60.83	28.90	22.18	123.38	111.92	235.29
2043	84.59	29.60	59.45	29.38	24.52	114.19	113.35	227.54
2044	76.54	28.84	57.94	29.82	26.97	105.38	114.72	220.10
2045	68.95	28.02	56.31	30.15	29.52	96.97	115.99	212.96

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

Valuation Date June 30	Current Inactives: Retirees & Beneficiaries	Current Inactives: Deferreds	Current Actives: Tier 1	Current Actives: Current Tier 2	Current Actives: Future Tier 2	Grand Totals: Current Retirees, Beneficiaries & Deferreds	Grand Totals: Actives	Grand Totals: Total
2019	$ 303.76	$ 29.28	$ 49.26	$ 13.37	$ -	$ 333.03	$ 62.63	$ 395.66
2020	297.67	30.12	51.78	13.91	1.00	327.79	66.68	394.47
2021	291.08	31.07	54.04	14.51	1.80	322.15	70.36	392.51
2022	284.02	31.73	56.12	15.14	2.72	315.75	73.98	389.73
2023	276.51	32.33	58.04	15.80	3.80	308.83	77.64	386.48
2024	268.56	32.81	59.73	16.47	4.86	301.36	81.07	382.43
2025	260.19	33.19	61.25	17.19	6.02	293.39	84.46	377.84
2026	251.44	33.50	62.63	17.94	7.10	284.94	87.67	372.60
2027	242.32	33.72	63.88	18.76	8.11	276.05	90.74	366.78
2028	232.89	33.90	64.92	19.59	9.42	266.79	93.94	360.73
2029	223.16	34.04	65.71	20.44	10.66	257.20	96.82	354.02
2030	213.20	34.15	66.33	21.31	12.07	247.34	99.71	347.06
2031	203.03	34.18	66.80	22.19	13.51	237.21	102.50	339.71
2032	192.72	34.17	67.11	23.09	15.04	226.89	105.23	332.12
2033	182.30	34.05	67.28	23.98	16.60	216.35	107.87	324.22
2034	171.85	33.85	67.23	24.86	18.42	205.69	110.51	316.20
2035	161.39	33.59	67.03	25.71	20.18	194.99	112.91	307.90
2036	151.01	33.29	66.70	26.50	22.19	184.30	115.39	299.69
2037	140.74	32.93	66.16	27.25	24.36	173.68	117.76	291.44
2038	130.66	32.52	65.42	27.92	26.58	163.18	119.92	283.10
2039	120.80	32.06	64.53	28.56	28.85	152.85	121.95	274.80
2040	111.21	31.54	63.49	29.10	31.27	142.75	123.86	266.61
2041	101.96	30.95	62.32	29.60	33.74	132.91	125.66	258.57
2042	93.07	30.30	61.02	30.01	36.58	123.38	127.61	250.99
2043	84.59	29.60	59.60	30.34	39.28	114.19	129.21	243.40
2044	76.54	28.84	58.05	30.64	42.05	105.38	130.74	236.12
2045	68.95	28.02	56.39	30.85	45.19	96.97	132.44	229.41

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

Valuation Date June 30	Current Inactives: Retirees & Beneficiaries	Current Inactives: Deferreds	Current Actives: Tier 1	Current Actives: Current Tier 2	Current Actives: Future Tier 2	Grand Totals: Current Retirees, Beneficiaries & Deferreds	Grand Totals: Actives	Grand Totals: Total
2019	$ 25.03	$ 1.02	$ 0.66	$ 0.32	$ -	$ 26.06	$ 0.99	$ 27.04
2020	25.13	0.98	1.06	0.29	0.02	26.11	1.38	27.48
2021	25.18	1.32	1.39	0.31	0.04	26.49	1.74	28.23
2022	25.17	1.42	1.67	0.32	0.07	26.59	2.06	28.65
2023	25.12	1.57	2.01	0.34	0.10	26.69	2.45	29.14
2024	25.02	1.69	2.30	0.34	0.13	26.71	2.77	29.48
2025	24.87	1.80	2.52	0.36	0.16	26.67	3.04	29.70
2026	24.67	1.89	2.74	0.34	0.19	26.56	3.26	29.83
2027	24.41	1.95	3.01	0.37	0.22	26.36	3.60	29.96
2028	24.09	2.00	3.32	0.41	0.24	26.09	3.97	30.06
2029	23.71	2.04	3.54	0.45	0.26	25.75	4.25	30.00
2030	23.28	2.12	3.73	0.49	0.28	25.40	4.50	29.89
2031	22.78	2.16	3.90	0.53	0.30	24.94	4.73	29.68
2032	22.23	2.27	4.06	0.59	0.33	24.50	4.97	29.47
2033	21.62	2.34	4.29	0.66	0.35	23.96	5.29	29.25
2034	20.95	2.38	4.43	0.75	0.38	23.33	5.56	28.89
2035	20.23	2.41	4.55	0.85	0.42	22.64	5.82	28.46
2036	19.46	2.44	4.72	0.94	0.46	21.90	6.13	28.03
2037	18.64	2.47	4.88	1.07	0.52	21.11	6.46	27.58
2038	17.78	2.50	4.98	1.14	0.57	20.28	6.69	26.97
2039	16.89	2.52	5.07	1.28	0.63	19.42	6.98	26.39
2040	15.97	2.56	5.13	1.35	0.70	18.53	7.19	25.72
2041	15.03	2.58	5.19	1.46	0.77	17.61	7.42	25.03
2042	14.08	2.59	5.22	1.57	0.86	16.67	7.65	24.33
2043	13.13	2.60	5.25	1.62	0.95	15.73	7.82	23.55
2044	12.18	2.61	5.26	1.72	1.05	14.79	8.03	22.82
2045	11.24	2.61	5.26	1.80	1.16	13.85	8.22	22.07

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

Valuation	Tier 1 Active Members				Tier 2 Active Members				Future Tier 2 Active Members			
Date June 30	Population	Covered Payroll	Employee Contributions	Normal Cost	Population	Covered Payroll	Employee Contributions	Normal Cost	Population	Covered Payroll	Employee Contributions	Normal Cost
2019	52	$ 4.54	$ 0.52	$ 2.11	74	$ 5.45	$ 0.63	$ 1.04	0	$ -	$ -	$ 0.00
2020	44	3.94	0.45	1.89	69	5.31	0.61	1.02	7	0.57	0.07	0.09
2021	38	3.52	0.40	1.67	64	5.05	0.58	1.00	11	0.99	0.11	0.16
2022	33	3.11	0.36	1.47	60	4.83	0.56	0.98	16	1.43	0.16	0.23
2023	28	2.72	0.31	1.27	56	4.58	0.53	0.94	21	1.94	0.22	0.32
2024	23	2.33	0.27	1.12	51	4.31	0.50	0.90	26	2.38	0.27	0.40
2025	20	2.06	0.24	0.99	47	4.08	0.47	0.88	30	2.85	0.33	0.49
2026	17	1.84	0.21	0.87	44	3.87	0.44	0.84	33	3.23	0.37	0.57
2027	15	1.62	0.19	0.76	40	3.63	0.42	0.79	35	3.53	0.41	0.64
2028	13	1.43	0.16	0.67	37	3.41	0.39	0.74	39	3.97	0.46	0.73
2029	11	1.25	0.14	0.56	33	3.17	0.36	0.71	41	4.31	0.50	0.80
2030	9	1.07	0.12	0.48	31	2.98	0.34	0.67	43	4.69	0.54	0.89
2031	8	0.92	0.11	0.40	28	2.80	0.32	0.63	45	5.03	0.58	0.96
2032	6	0.79	0.09	0.35	26	2.61	0.30	0.59	47	5.35	0.62	1.03
2033	5	0.68	0.08	0.30	23	2.43	0.28	0.55	48	5.64	0.65	1.10
2034	5	0.59	0.07	0.25	21	2.26	0.26	0.51	50	6.01	0.69	1.18
2035	4	0.51	0.06	0.22	19	2.08	0.24	0.46	51	6.28	0.72	1.24
2036	3	0.44	0.05	0.18	17	1.90	0.22	0.42	53	6.64	0.76	1.32
2037	3	0.36	0.04	0.15	15	1.73	0.20	0.38	54	7.00	0.81	1.39
2038	2	0.30	0.03	0.12	13	1.57	0.18	0.34	56	7.33	0.84	1.46
2039	2	0.25	0.03	0.10	12	1.44	0.17	0.31	56	7.62	0.88	1.52
2040	1	0.20	0.02	0.08	11	1.31	0.15	0.28	57	7.92	0.91	1.59
2041	1	0.17	0.02	0.06	9	1.18	0.14	0.25	58	8.19	0.94	1.65
2042	1	0.13	0.02	0.05	8	1.06	0.12	0.22	59	8.59	0.99	1.72
2043	1	0.11	0.01	0.04	7	0.94	0.11	0.20	59	8.84	1.02	1.78
2044	1	0.09	0.01	0.03	6	0.85	0.10	0.17	59	9.07	1.04	1.83
2045	0	0.07	0.01	0.03	5	0.75	0.09	0.15	60	9.45	1.09	1.90

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