State Universities Retirement System of Illinois

Actuarial Valuation Report as of June 30, 2019

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September 26, 2019

Board of Trustees
State Universities Retirement System of Illinois
1901 Fox Drive
Champaign, Illinois 61820

Dear Members of the Board:

At your request, we present the report of the actuarial valuation of the State Universities Retirement System of Illinois ("SURS") as of June 30, 2019. GRS has prepared this report exclusively for the Trustees of the State Universities Retirement System; GRS is not responsible for reliance upon this report by any other party. This report may be provided to parties other than SURS only in its entirety and only with the permission of the Trustees.

This actuarial valuation provides information on the funding status and the contribution requirements of SURS. This actuarial valuation includes a determination of the statutory State contribution requirement (the "Statutory Contribution") for the fiscal year ending June 30, 2021, and provides estimates of Statutory contributions for subsequent years under Section 15-155 of the SURS Article of the Illinois Pension Code as amended by the provisions of Public Act ("PA") 100-0023 and 100-0587. SURS is currently not moving forward with the implementation of the Optional Hybrid Plan (OHP) created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so. Therefore, provisions related to the OHP are not reflected in this actuarial valuation. Under the provisions of PA 100-0023, employers make contributions beginning in fiscal year 2018 for current members who receive pay in excess of the Governor's pay and under PA 101-0010 (which rescinded the change to 3% from PA 100-0587), employers make contributions equal to the present value of the increase in benefit attributable to members who receive pay increases in excess of 6% during the final average salary (FAS) period. Information required by Governmental Accounting Standards Board ("GASB") Statement Nos. 67 and 68 is provided in a separate report. This report should not be relied on for any purpose other than the purpose described herein.

This actuarial valuation is based on the provisions of SURS in effect as of June 30, 2019 data on the SURS membership and information on the asset value of the trust fund as of that date. This actuarial valuation does not reflect the provisions of Public Act 98-0599 due to the court ruling that the changes in the Public Act were unconstitutional. The actuarial valuation was based upon the information furnished by SURS staff, concerning SURS benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal 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 SURS.

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The benefit provisions for members hired on or after January 1, 2011 were changed under Public Act 96-0889, which created a second tier of benefits for new members. 30% of assumed new hires in the actuarial valuation projections are assumed to elect the Self-Managed Plan and 70% are assumed to elect Tier 2 under Public Act 96-0889. The plan election assumptions were provided by SURS staff.

The assumed increase in the Governor's pay for purposes of projecting employer contributions was decreased from 3.25% to 1.125%. The actuarial cost method (Projected Unit Credit, as required by statute) and the asset smoothing method (also as required by statute) and all other assumptions and methods used in this actuarial valuation are unchanged from the prior June 30, 2018 actuarial valuation of SURS.

The actuarial assumptions were adopted by the Board pursuant to Sec. 15-155 of 40 ILCS 5 of the Illinois Pension Code. In our opinion, the actuarial assumptions are reasonable for the purpose of the measurement.

To the best of our knowledge, this actuarial statement is complete and accurate, fairly presents the actuarial position of SURS as of June 30, 2019, and has been prepared in accordance with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

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; 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 plan's funded status); and changes in plan provisions, contribution amounts or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements in this report.

Actuarial valuations do not affect the ultimate cost of the Plan, only the timing of contributions into the Plan. Plan funding occurs over time. Contribution shortfalls (the difference between the actual contributions and the annual required contributions) remain the responsibility of the Plan sponsor and can be made in later years. If the contribution levels over a period of years are lower or higher than necessary, it is normal and expected practice for adjustments to be made to future contribution levels to take account of this variance, with a view to funding the plan over time.

Although prior year 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 development and adherence to a funding policy that funds the normal cost of the plan as well as an amortization payment that would seek to pay off the total unfunded accrued liability over a closed period of no less than 15 years (to limit contribution volatility) and no more than the period of time in order to attain 100% funding by 2045 (25 years remaining in the actuarial valuation as of June 30, 2019).

The signing actuaries are independent of the plan sponsor.

Amy Williams, Lance J. Weiss and David T. Kausch are Members of the American Academy of Actuaries ("MAAA") and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions herein.

Respectfully submitted,

Amy Williams, ASA, MAAA	Lance J. Weiss, EA, MAAA	David T. Kausch, FSA, EA, MAAA
Senior Consultant	Senior Consultant and Team Leader	Senior Consultant and Chief Actuary

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Summary of the Actuarial Valuation

Executive Summary
($ in Millions)

Actuarial Valuation Date:	June 30, 2018		June 30, 2019	
Fiscal Year Ending:	June 30, 2020		June 30, 2021	
		% of Projected Capped Payroll		% of Projected Capped Payroll
Estimated Statutory Contribution:				
· Defined Benefit Plans Contribution Amount [1]	$ 1,827.623	40.16%	$ 1,959.227	41.98%
· Self Managed Plan Contribution Amount [1]	72.288	1.59%	77.488	1.66%
· Total Qualified Plan Contribution Amount	$ 1,899.911	41.75%	$ 2,036.715	43.64%
· Excess Benefit Arrangement (EBA) Contribution Amount [2]	17.065	0.37%	18.000	0.39%
· Combined State and Employer Contribution Amount	$ 1,916.976	42.12%	$ 2,054.715	44.02%
Estimated Statutory Contribution from Other Sources:				
· Federal/Trust Contribution Amount	$ 52.000		$ 52.500	
· Employer Contribution Amount Related to				
- Compensation in Excess of Governor's	$ 5.124		$ 5.529	
- Pay Increases in Excess of 3% During FAS Period [5]	5.160		-	
- Total Employer Contribution Amount	$ 10.284		$ 5.529	
Net State Contribution:				
· Net Dollar Amount (Including EBA Contribution)	$ 1,854.693	40.75%	$ 1,996.686	42.78%
Actuarially Determined Contribution (ADC): [3]				
· Annual Amount	$ 2,390.524	52.53%	$ 2,452.773	52.55%
Membership				
· Number of				
- Active Members (full time and part time)	74,950		75,120	
- Members Receiving Payments [3]	66,169		67,842	
- Inactive Members	91,874		93,077	
- Total	232,993		236,039	
· Covered Payroll Provided as of Valuation Date	$ 4,264.300		$ 4,356.631	
· Projected Capped Payroll for Fiscal Year	4,550.976		4,667.191	
· Defined Benefit Plan Capped Payroll [4]	3,470.226		3,506.650	
· Annualized Benefit Payments [3]	2,446.058		2,560.431	
Assets [2]				
· Market Value of Assets (MVA)	$ 19,321.076		$ 19,657.456	
· Actuarial Value of Assets (AVA)	19,347.886		19,650.070	
· SURS Reported Market Value Rate of Return	8.25%		6.07%	
· Estimated Return on MVA	8.26%		5.64%	
· Estimated Return on AVA	7.76%		5.46%	
· Ratio – AVA to MVA	100%		100%	
Actuarial Information [3]				
· Total Normal Cost Rate	21.03%		20.71%	
· Employer Normal Cost Rate	13.02%		12.70%	
· Employer Normal Cost Amount	$ 449.903		$ 444.743	
· Actuarial Accrued Liability (AAL)	45,258.751		46,443.937	
· Unfunded Actuarial Accrued Liability (UAAL)	25,910.865		26,793.867	
· Funded Ratio based on AVA	42.75%		42.31%	
· UAAL as % of Defined Benefit Plan Capped Payroll	746.66%		764.09%	
· Funded Ratio based on MVA	42.69%		42.33%	
· Defined Benefit Plans Contribution Amount as % of ADC	76.45%		79.88%	

Amounts from the June 30, 2018 and June 30, 2019 actuarial valuations assume 30% elect SMP and 70% elect Tier 2.

[1] *SMP contributions are net of SMP forfeitures of $7,941,000 for fiscal year 2020 and of $6,578,000 for fiscal year 2021. Projected Self Managed Plan (SMP) contribution is updated based on the most recent actuarial valuation. Contribution amount for SURS defined benefit plans is the total qualified plan statutory contribution minus the SMP contribution.*

[2] *Amounts provided by SURS. June 30, 2018 amount includes $11,500,000 for fiscal year 2020 and $5,565,156 for fiscal years 1998 through 2013.*

[3] *Excludes SMP.*

[4] *Defined benefit payroll from the current actuarial valuation increased with one year of wage inflation.*

[5] *Pay increases in excess of 6% during FAS period for fiscal year 2021 are included in the Federal/Trust Contribution Amount.*

Purposes of the Actuarial Valuation

At your request we have performed an actuarial valuation of the State Universities Retirement System of Illinois ("SURS") as of June 30, 2019.

The purposes of this actuarial valuation are as follows:

- To determine the funding status of SURS as of the valuation date based on the market value of assets and the actuarial value of assets; and
- To develop the level of contributions required under Section 15-155 of the SURS Article of the Illinois Pension Code as amended by the provisions of PA 100-0023 and PA 100-0587, (1) for the fiscal year ending June 30, 2021, and (2) to estimate contributions required under that Section for subsequent years of the funding period ending in the year 2045.

Accounting information required under Governmental Accounting Standards Board ("GASB") Statement Nos. 67 and 68 is presented in a separate report.

Report Highlights

The Statutory contribution (including the employer contribution and federal and trust fund contributions) for FY 2021 is $2.055 billion ($2.037 billion excluding the EBA contribution) and includes the State's projected normal cost of $431.8 million, an unfunded liability contribution of $1.527 billion, a contribution to fund benefits from the Excess Benefit Arrangement ("EBA") of $18.0 million and the Self Managed Plan ("SMP") contribution of $77.5 million. The 2018 actuarial valuation had projected the Statutory contribution would increase, from $1.900 billion for FY 2020 to $1.998 billion for FY 2021 (excluding EBA contributions). The primary reason for the increase in the Statutory contribution over the projected amount from the prior actuarial valuation is due to unfavorable experience.

Over the past 10 years, SURS experienced investment gains on a market value basis (compared to the actuarial assumption) in fiscal years 2010, 2011, 2013, 2014, 2017 and 2018. However, SURS incurred investment losses (or shortfalls in return compared to the actuarial assumption) in fiscal years 2012, 2015, 2016 and 2019. The market return for the year ending June 30, 2019, was approximately 6.07% compared to a return of 8.25% in FY 2018. The average market value investment return over the most recent 10 years has been approximately 9.7%.

The funded ratio decreased from 42.7% as of June 30, 2018, to 42.3% as of June 30, 2019, based on the market value of assets, and decreased from 42.8% as of June 30, 2018, to 42.3% as of June 30, 2019, based on the actuarial value of assets. The net deferred asset gains will be recognized in the actuarial value of assets over the next four years.

The ratio of the market value of assets of the Defined Benefit Plan to the annual deductions (consisting of benefit payments, refunds of contributions and administrative expenses) and sometimes referred to as the liquidation ratio is about 7.4.

This means that approximately seven to eight years of retiree benefit payments can be paid from current assets. The ability to make such payments beyond that period is heavily dependent upon future State and employer contributions and future investment return.

Actuarial Assumptions

The asset valuation method was changed from market value of assets to actuarial value of assets effective with the actuarial valuation as of June 30, 2009, as required by statute.

The plan election assumptions for new hires remain the same as in the prior actuarial valuation. Future new hires are assumed to elect to participate in the offered plans as follows: 30% would elect to participate in the Self-Managed Plan (SMP) and 70% would elect to participate in the Tier 2 Plan.

All actuarial assumptions were first adopted by the Board for use with the actuarial valuation as of June 30, 2018, and were based on the recommendations from the experience review performed for the period from June 30, 2014, through June 30, 2017.

The assumption for members electing the accelerated pension benefit payment options is 0%. The rationale for this assumption can be found in a separate letter issued to the Board. There have been no buyout elections from the applications received as of the date this report was issued.

The assumptions can be found in Appendix G of the report.

In addition, we have assumed that the Statutory contribution will be calculated as a level percentage of pensionable payroll. Pensionable payroll for members hired on or after January 1, 2011 is limited by the pay cap for Tier 2 members. The basis for this assumption comes from 40 ILCS 5/1-160 (b-5) for Tier 2.

SURS Benefits

Public Act 100-0587 created accelerated pension benefit payment options for eligible members beginning on the implementation date and until June 30, 2021. (Public Act 101-0010 extended the buyout period from June 30, 2021 through June 30, 2024 for both accelerated pension benefit options.) There are two accelerated pension benefit payment options that are being offered: (1) for vested inactive members, a payment equal to 60% of the present value of the member’s pension benefit in lieu of receiving any pension benefit, and (2) for active Tier 1 members eligible for retirement, a payment equal to 70% of the difference between: (i) the present value of the automatic annual increases (AAI) to a Tier 1 member's retirement annuity under the current AAI provisions and (ii) the present value of the automatic annual increases to the Tier 1 member's retirement annuity under revised AAI provisions. All other benefit provisions valued in this June 30, 2019 actuarial valuation are identical to those valued in the prior actuarial valuation as of June 30, 2018. Due to the court ruling recent pension reform unconstitutional, this actuarial valuation does not reflect the provisions of Public Act 98-0599.

Experience During 2019

The System assets earned approximately 6.07% on a market value basis during FY 2019 which was less than the investment return assumption of 6.75% for FY 2019. The System assets earned 5.46% on an actuarial value of assets basis during FY 2019, due to recognition of net deferred investment losses under the asset smoothing method. Because 5.46% is less than the assumed rate of investment return of 6.75%

for FY 2019, there was an asset loss of $246.1 million on the actuarial value of assets.

There was also a net loss of $119.5 million from actuarial liabilities, which is comprised of a loss of approximately $174.7 million from demographic experience, and a gain of $55.2 million from lower than expected pay increases.

The SURS defined benefit programs experienced an overall actuarial loss of $365.6 million.

The experience of the population determines the liability gain or loss for the year. There was a gain on salaries, due to lower salary increases than assumed and a small gain from active member mortality experience. From last year to this year, there were losses from retirement, termination, disability and retiree mortality experience. As always, there was a new entrant loss. The new entrant loss occurs each year, but is offset by additional contributions to the assets. The other assumptions not easily attributable to one of the other categories generated an actuarial gain.

See Table 10 (page 27), Appendix C, for detail of the gains and losses by source.

Statutory Appropriations for the 2021 Fiscal Year and Beyond

Section 15-155, which governs the development of Employer/State contributions to SURS, provides that:

1. Employer/State contributions are determined under the following process:

   a) The overall objective of the statute is to achieve a funded ratio of 90% by the end of fiscal year ("FY") 2045.

   b) The Employer/State contribution for FY 2012 and each year thereafter to and including FY 2045 is to be based on a (theoretically) constant percentage of the payroll[1] of active members of SURS based on the actuarial value of assets at the actuarial valuation date and assuming the actuarial value of assets earns the assumed investment return in the future.

[1] *We have assumed the contribution would be based on pensionable payroll. Pensionable payroll for members hired on or after January 1, 2011, is limited by the pay cap.*

i. Requires any change in an actuarial assumption that increases or decreases the required State contribution to be implemented in equal annual amounts over a five-year period beginning in the State fiscal year in which the change first applies to the required State contribution.
   - For changes that first applied in FY 2014, FY 2015, FY 2016 or FY 2017, the impact is calculated based on a five-year period and the applicable portion is recognized during the remaining fiscal years in that five-year period.

ii. Requires the State to make additional contributions to SURS in FY 2018, FY 2019 and FY 2020 equal to 2% of the total payroll of each employee who participates in the Optional Hybrid Plan or who participates in the Tier 2 Plan in lieu of the Optional Hybrid Plan.

iii. Requires employers to make contributions as follows:

- Requires employers to contribute the employer normal cost of the portion of an employee's earnings that exceeds the amount of salary set for the governor, for academic years beginning on or after July 1, 2017. (Applicable to Tier 1 and Tier 2 employees.)
- Requires employers to contribute for each employee of the employer who participates in the Optional Hybrid Plan or participates in the Tier 2 Plan in lieu of the Optional Hybrid Plan.
  1) The employer normal cost for Fiscal Years 2018, 2019 and 2020.
  2) The employer normal cost plus two percent of pay for Fiscal Years 2021 and thereafter.
  3) Beginning in FY 2018, the amount for that fiscal year to amortize any unfunded actuarial accrued liability attributable to the defined benefits of the employer's employees who first became participants on or after the implementation date of the Optional Hybrid Plan and the employer's employees who were previously Tier 2 participants but elected to participate in the Optional Hybrid Plan, determined as a level percentage of payroll over a 30-year rolling amortization period.
  4) For academic years beginning on or after July 1, 2018, and for earnings paid under a contract or collective bargaining agreement entered into, amended or renewed on or after the effective date of the amendatory Act, if a participant's earnings for any academic year with the same employer as the previous academic year used to determine the final average salary increased by more than 3.00%, then the participant's employer shall pay the System the present value of the increase in benefits resulting from the portion of the increase in earnings that is in excess of 3.00%. Prior to the effective date of Public Act 100-0587, the payment from employers was for pay increases in excess of 6.00%.

c) After 2045, the Employer/State contribution rate is to be sufficient to maintain the funding level at 90%.
- Employers continue to make the required normal cost and unfunded liability contributions.
- The financial impact of changes in actuarial assumptions continue to be phased in over a five-year period.

2. During the period of amortization of the 2003 bond issue, the Employer/State contribution in any fiscal year may not exceed the difference between:

   a) The contribution, as developed in the preceding number 1., assuming that the special contribution (from the bond proceeds) has not been made, and

   b) The debt service on the bond issue for the fiscal year.

3. Pursuant to Public Act 97-0694, Section 15-165, the dollar amount of the proposed Employer/State contribution required for a fiscal year shall be certified to the Governor no later than November 1 for the fiscal year commencing on the following July 1. The required amounts are budgeted pursuant to the continuing appropriations process. The State Actuary

is required to review the actuarial assumptions and actuarial valuation and issue a preliminary report. After the Board considers the State Actuary's report, the certification is finalized no later than January 15.

SURS is currently not moving forward with the implementation of the Optional Hybrid Plan (OHP) created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so. Therefore, contributions related to the OHP are not included in the actuarial valuation, including contributions for employer normal cost, additional 2% of payroll contributions and unfunded liability contributions. Estimates of Statutory contributions through 2045, assuming that 70% of future new members elect the Tier 2 Plan, 30% of future new members elect SMP and all other actuarial assumptions are realized, are set out in Table 14 (page 34).

The Statutory contributions set out in this report represent the contribution amount determined consistent with the State Statute. The net State appropriation certified to the Governor is the total calculated in this report for the qualified plan, plus an estimated amount to fund the annual benefit payments payable from the Excess Benefit Arrangement (EBA), adjusted by contributions from federal and trust funds and employers. The estimated contributions from the federal and trust funds for FY 2021 is $52,500,000, as estimated by SURS.

Asset Information

Prior to the actuarial valuation as of June 30, 2009, the market value, without adjustment, was used for all actuarial purposes. Legislation in 2009 required that first effective for the actuarial valuation as of June 30, 2009, contribution projections would be calculated based on the actuarial value of assets. Funding status determinations and the contribution requirements were calculated based on the actuarial value of assets.

The market value of the assets of the System that is available for benefits increased from $19,321.1 million as of June 30, 2018, to $19,657.5 million as of June 30, 2019. The actuarial value of assets as of June 30, 2019, is $19,650.1 million, which is $7.4 million lower than the market value of assets. This difference is due to the continuing recognition of deferred investment gains and losses. Twenty percent of these gains and losses are recognized each year. The $7.4 million, which is the value of net deferred gains, will be smoothed into the actuarial value of assets over the next four years. The remaining unrecognized net asset gains from FY 2017 and FY 2018 will be smoothed in over the next two and three years, respectively, and the remaining asset losses from FY 2016 and FY 2019 will be smoothed in over the next one and four years, respectively.

The detailed determinations of asset values utilized in this valuation and asset growth in the last year are set out in Appendix A and Table 7 (page 24) of Appendix C.

Funding Status

The funding status of SURS is measured by the Funded Ratio. The Funded Ratio is the ratio of the assets available for benefits compared to the actuarial accrued liability of the System. Thus, it reflects the portion of benefits earned to date by SURS members, which are covered by current System assets.

A funded ratio of 100% means that all of the benefits earned to date by SURS members are covered by assets. By monitoring changes in the funded ratio each year we can determine whether or not funding progress is being made.

As shown below, the SURS funded ratio decreased from 42.7% as of June 30, 2018, to 42.3% as of June 30, 2019, based on the market value of assets, and decreased from 42.8% as of June 30, 2018, to 42.3% as of June 30, 2019, based on the actuarial value of assets. There are net deferred gains that will be smoothed into the actuarial value of assets over the next four years. As a result of the net deferred gains and the funding policy, the funded ratio is projected to increase slightly over the next four years if all assumptions are realized and all employer contributions are made on a timely basis.

Fiscal	Funded Ratio	
Year	AVA	MVA
2015	43.3 %	44.2 %
2016	43.3	41.6
2017	44.4	44.2
2018	42.8	42.7
2019	42.3	42.3

Short Condition Test

The following table shows a comparison, for fiscal years 2010 through 2019, of the percentage of benefits that are covered by the actuarial value of assets. The employer financed liabilities for current active and inactive members are 0% funded by the assets. Only a portion of the retiree liabilities are funded by current assets and the percentage covered decreased from 41.8% as of June 30, 2018, to 41.0% as of June 30, 2019.

Percentage of Benefits Covered by Net Assets (in Millions)							
	Member	Members	Act/Inact	Net	% of Benefits Covered by Assets		
	Acc	Receiving	Employer	Actuarial			
Fiscal	Contrib.	Benefits	Portion	Value of			
Year	(1)	(2)	(3)	Assets	(1)	(2)	(3)
2010	$ 5,916.3	$ 16,834.4	$ 7,369.7	$ 13,966.6	100.0%	47.8%	0.0%
2011	6,007.4	18,918.1	6,588.8	13,945.7	100.0%	42.0%	0.0%
2012	5,962.4	20,651.4	6,556.4	13,949.9	100.0%	38.7%	0.0%
2013	5,830.1	22,099.9	6,443.1	14,262.6	100.0%	38.2%	0.0%
2014	6,094.9	24,388.6	6,946.0	15,844.7	100.0%	40.0%	0.0%
2015	6,196.6	26,042.4	7,281.7	17,104.6	100.0%	41.9%	0.0%
2016	6,145.8	27,342.2	7,435.3	17,701.6	100.0%	42.3%	0.0%
2017	6,348.8	28,226.0	7,278.6	18,594.3	100.0%	43.4%	0.0%
2018	6,516.3	30,710.7	8,031.7	19,347.9	100.0%	41.8%	0.0%
2019	6,593.4	31,856.5	7,994.1	19,650.1	100.0%	41.0%	0.0%

Actuarial Funding and Statutory Funding

Measuring the Statutory Contribution against a funding policy under which the sum of the normal cost and amortization of the unfunded accrued liability is contributed helps evaluate the funding adequacy of the current Statutory funding method. The rationale for contributions based on an accrual pattern of normal cost plus amortization of the unfunded liability is to have benefits accrued within the same generation that has earned them as well as to ensure that all benefit obligations will be met. Table 14 illustrates an "alternative policy contribution" which is the sum of the employer normal cost and a 30-year closed period from June 30, 2015 (25 years remaining as of June 30, 2020) level percentage of defined benefit plan capped payroll amortization payment. The alternative funding policy would require higher contributions in the near term compared to the Statutory funding policy. However, as shown in Graph 1 (page 30) and Graph 4 (page 35), the funded ratio would increase more quickly and require lower contributions than under the Statutory policy after approximately 13 years. The Statutory contributions are projected to continue to rise in order to meet the ultimate funding objective of a 90% funded ratio in 2045.

Based on projections assuming that the Statutory contributions are made every year (as shown in Table 12, page 29) and an investment return of 6.75% each year, the funded ratio is projected to begin to increase from about 42% funded to 90% funded at 2045. The funded ratio is not projected to exceed 50% until 2031, 70% until 2041 and is projected to increase to 90% during the four-year period from 2041 until 2045. If the Statutory contributions are not made or investment return is less than the assumption of 6.75%, the funded ratio will be lower and the cash flow strain will be higher. If another significant market downtown occurred while the System's funded ratio is low, the System could be required to liquidate assets in order to pay benefits which could have a further adverse effect on the funded status of the System.

The projected actuarial accrued liability of current retirees, current active and inactive members and future members is expected to increase from $46.444 billion as of the end of FY 2019 to $51.394 billion as of the end of FY 2045 (as shown in Graph 2, page 31, and Table 23, page 44). Total benefit payments are projected to increase from $2.640 billion in fiscal year 2019 to $4.337 billion in fiscal year 2045. Graph 3 (page 32, and Table 22, page 43) shows projected benefit payments separately for retirees as of June 30, 2019, active and inactive members as of June 30, 2019, and future members.

Additional Projection Details

At the request of the State Actuary, we have included exhibits with additional projection details that can be found in Appendix E. The additional projections illustrate the impact on contributions and funded status if deferred asset gains and losses are not recognized.

Recommendations

The calculations in this report were prepared based on the methods required by the Statutory funding policy including the asset smoothing method that was adopted for the first time in the June 30, 2009 actuarial valuation. GRS does not endorse this funding policy because the Statutory funding policy defers funding for these benefits into the future and places a higher burden on future generations of taxpayers.

We recommend the following changes:

1. Implementing a funding policy that contributes normal cost plus closed period amortization as a level percentage of defined benefit plan capped payroll of the unfunded liability. (Policy which recognizes unfunded liability at the valuation date and not projected liability in the year 2045.)
2. If the current Statutory funding policy is retained, we recommend:
    a. Eliminating the maximum contribution cap
    b. Calculating contributions as a level percentage of defined benefit plan payroll only instead of total payroll (including SMP payroll)
    c. Eliminating smoothing of the change in the contribution requirement due to assumption changes.
3. Implementing an asset corridor to constrain the actuarial value of assets within a certain percentage of the market value of assets (for example, 20 percent).
4. Changing the actuarial cost method for calculating liabilities from the Projected Unit Credit to the Entry Age Normal method.
5. Considering whether a decrease in total active membership is expected to continue, and if so, incorporating this into the projections used to calculate the Statutory contribution requirements.

Change Funding Policy to a More Standard Actuarial Method

We recommend a funding policy that contributes normal cost plus closed period amortization as a level percentage of defined benefit plan capped payroll for paying off the current unfunded accrued liability (i.e., the amortization period declines by one year with each actuarial valuation) such that the funded ratio is projected to be 100 percent funded by 2045 or earlier. A 30-year closed amortization period (at the actuarial valuation as of June 30, 2014) methodology pays off the unfunded accrued liability in full by the end of the 30-year period in 2045. The Fiscal Year 2021 contribution would be $2,530.261 ($2,452.773 million for the SURS contribution and $77.488 million for SMP) under this alternate funding policy. The current Statutory contribution does not comply with this recommendation. Underfunding the System creates the risk that ultimately benefit obligations cannot be met from the trust, and will require a greater amount of funding from other State resources. In addition, continually underfunding the System also creates more of a funding need from contributions since less is available from investment return – thereby creating a more expensive plan. Projected contributions under the current Statutory policy and the recommended policy are shown in Graph 4 on page 35 and projected funded ratios are shown in Graph 1 on page 30.

Eliminate Maximum Contribution Cap

If the current statutory funding policy is not changed, we recommend that the provision that establishes a maximum contribution cap be eliminated. The contribution cap is based on the projected hypothetical contributions if the proceeds from the 2003 bond issue had not been received. The cap is projected to lower contributions during fiscal years 2024 through 2033 compared to if no maximum contribution methodology was in place.

Calculate Defined Benefit Plan Contributions Based on Defined Benefit Payroll Only

Currently, the Statutory contributions to the SURS defined benefit plan are calculated based on a level percentage of total pensionable payroll, including SMP payroll. We recommend that the contributions be calculated as a level percentage of defined benefit plan pensionable payroll only.

Implement an Asset Corridor

In addition, we recommend that an asset corridor on the actuarial value of assets be implemented, in the event that there is another significant market downturn similar to Fiscal Year 2009. The following table compares the ratio of the actuarial value of assets to the market value of assets since Fiscal Year 2009. Using an actuarial value of assets that is significantly higher than the market value of assets delays funding to the System by further deferring contributions into the future. The plan is already in serious funding jeopardy, and we cannot recommend an asset valuation method that does not include a corridor because it could add additional risk to the funding of the benefit obligations if another downturn occurred.

($ in Millions)			
Year	Actuarial Value of Assets	Market Value of Assets	Ratio of Actuarial Value to Market Value
2010	$ 13,966.643	$ 12,121.542	115 %
2011	13,945.680	14,274.003	98
2012	13,949.905	13,705.143	102
2013	14,262.621	15,037.102	95
2014	15,844.714	17,391.323	91
2015	17,104.607	17,462.968	98
2016	17,701.646	17,005.630	104
2017	18,594.326	18,484.820	101
2018	19,347.886	19,321.076	100
2019	19,650.070	19,657.456	100

Change the Actuarial Cost Method to the Entry Age Normal Method

The current actuarial cost method is the Projected Unit Credit method, which is required by statute. The Projected Unit Credit method recognizes costs such that the normal cost for an individual member increases as a percentage of payroll throughout his/her career. The Entry Age Normal cost method is the most commonly used method in the public sector. It is also the method required to be used for financial reporting under GASB 67 and 68. The Entry Age Normal method recognizes costs as a level percentage of payroll over a member's career. We recommend a change to the Entry Age Normal method.

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, death or disability). The number of active members has decreased by about 10 percent between 2009 and 2019, which is an average annualized decrease of about 1.1 percent.

Summary of the Valuation

Currently, the actuarial valuation assumes that the total number of active members in the future will be equal to the number active in the current actuarial valuation. Given the decrease in the number of active members over the past 10 years, if SURS expects to continue to see a similar decline of the active population in the near term the Board may want to consider an update to the population projection assumption to include a decreasing population in the near term before reaching an equilibrium number of active members long term.

Total Active Members (Full and Part Time)						
June 30	Traditional & Portable	SMP	Total	Annual Change in Membership	% Annual Change in Membership	Earnings ($ in Millions)
2009	73,699	9,846	83,545			$3,872.6
2010	72,996	9,746	82,742	(803)	-1.0%	3,904.6
2011	71,888	9,723	81,611	(1,131)	-1.4%	3,893.4
2012	71,056	10,100	81,156	(455)	-0.6%	3,956.6
2013	70,556	10,746	81,302	146	0.2%	4,078.1
2014	69,436	11,409	80,845	(457)	-0.6%	4,131.0
2015	69,381	11,928	81,309	464	0.6%	4,280.5
2016	66,245	11,880	78,125	(3,184)	-3.9%	4,218.4
2017	64,117	11,852	75,969	(2,156)	-2.8%	4,184.5
2018	62,844	12,106	74,950	(1,019)	-1.3%	4,264.3
2019	62,589	12,531	75,120	170	0.2%	4,356.6
Total Change				(8,425)	-1.1%	

We recognize that the State Statute governs the funding policy of the System. The purpose of these comments is to highlight the difference between the Statutory appropriation methodology and the recommended actuarially sound funding policy and to highlight the risks and additional costs of continuing to underfund the System. We believe that the State Statute would allow the Board to change the assumption regarding the projected number of future active members.

GASB Disclosure

A separate actuarial valuation report with calculations completed in accordance with the provisions of GASB Statement Nos. 67 and 68 has been issued.

Future Considerations

Changes (such as the phase-in of assumption changes, five-year asset smoothing and the addition of the two new benefit tiers) have had the effect of reducing the Statutory contribution amounts that would have otherwise been made. However, the change in the investment return assumption and other changes to more closely align the actuarial assumptions with current market expectations have increased the contribution amounts that would otherwise have been made. Assuming the statutory contributions are received (and the actuarial assumptions are met including a 6.75% investment rate of return, each year through 2045) SURS is currently projected to have contributions sufficient to increase the funded ratio from the current level of 42.3% to 90.0% by 2045.

This is a severely underfunded plan and the ability of the plan to reach 90% funding by 2045 is heavily dependent on the plan sponsor contributing the statutory contributions each and every year until 2045. We are not able to assess the plan sponsor's ability to make contributions when due.

Actuarial Standards of Practice (ASOP) 4 Disclosures

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 6.75% on the actuarial value of assets), it is expected that:

1. The combined State and employer contribution rate will be level as a percentage of payroll through 2045 (after all assumption changes and deferred asset gains and losses are fully recognized);
2. The unfunded liability will increase in dollar amount through 2025 before it begins 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% 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 a 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 amortization 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% is not synonymous with no required future contributions. If the funded status were 100%, 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.

Risks Associated with Measuring the Accrued Liability and Contributions

The determination of the accrued liability and the statutory and actuarially determined 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 statutory and actuarially determined 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 Plan'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 plan'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 plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll or other relevant contribution factor;
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;
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 may be considered as a minimum contribution that complies with State statute. The timely receipt of contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made in accordance with the funding policy do not necessarily guarantee benefit security.

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:

	2018	2019
Ratio of the market value of assets to total payroll	4.53	4.51
Ratio of actuarial accrued liability to payroll	10.61	10.66
Ratio of actives to retirees and beneficiaries	1.13	1.11
Ratio of net cash flow to market value of assets	-3.4%	-3.7%

Payroll used in the above table includes SMP payroll.

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 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% 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% 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 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% 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.

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.

APPENDICES

Appendix A

Asset Information

Table 1
Statement of Plan Net Position
as of June 30, 2019 and June 30, 2018

	Defined Benefit Plan	Self Managed Plan	Reporting Entity Totals 2019	Reporting Entity Totals 2018
Assets				
Cash and short-term investments	$ 619,413,471	-	$ 619,413,471	$ 672,523,980
Receivables				
Members	12,384,509	$ 4,683,007	17,067,516	15,077,426
Non-employer contributing entity	150,635,000	2,353,640	152,988,640	76,803,782
Federal, trust funds, and other	7,112,498	61,111	7,173,609	6,586,210
Pending investment sales	560,501,773	-	560,501,773	290,212,669
Interest and dividends	47,226,953	-	47,226,953	47,303,282
Total receivables	777,860,733	7,097,758	784,958,491	435,983,369
Prepaid expenses	147,246	-	147,246	158,297
Investments, at fair value				
Equity investments	10,442,831,732	70,018,218	10,512,849,950	10,773,499,828
Fixed income investments	4,844,127,034	36,021,393	4,880,148,427	4,784,437,115
Real estate investments	1,182,502,310	7,928,568	1,190,430,878	1,012,089,478
Alternative investments	2,380,452,474	15,960,713	2,396,413,187	2,437,471,544
Mutual fund and variable annuities		2,592,580,384	2,592,580,384	2,370,017,322
Total investments	18,849,913,550	2,722,509,276	21,572,422,826	21,377,515,287
Securities lending collateral	878,205,520	-	878,205,520	780,639,420
Capital assets, at cost, net of accum deprec $20,147,309 and $19,688,845 respectively	9,796,210	-	9,796,210	6,109,409
Total assets	21,135,336,730	2,729,607,034	23,864,943,764	23,272,929,762
Liabilities				
Benefits payable	10,467,190	-	10,467,190	13,124,100
Refunds payable	5,200,177	-	5,200,177	4,946,571
Securities lending collateral	876,550,517	-	876,550,517	779,626,493
Payable to brokers for unsettled trades	483,348,912	-	483,348,912	603,464,724
Reverse repurchase agreements	85,456,713	-	85,456,713	34,476,500
Administrative expenses payable	16,856,965	-	16,856,965	15,763,409
Total liabilities	1,477,880,474	-	1,477,880,474	1,451,401,797
Plan Net Position	$ 19,657,456,256	$ 2,729,607,034	$ 22,387,063,290	$ 21,821,527,965

Table 2
Statement of Changes in Plan Net Position
for Years Ended June 30, 2019 and June 30, 2018

	Defined Benefit Plan	Self Managed Plan	Reporting Entity Totals 2019	Reporting Entity Totals 2018
Additions				
Contributions				
Employer	$ 49,605,273	$ 8,718,499	$ 58,323,772	$ 48,004,864
Non-employer contributing entity	1,592,639,155	62,514,845	1,655,154,000	1,629,307,607
Member	280,017,618	88,570,595	368,588,213	366,944,715
Total Contributions	1,922,262,046	159,803,939	2,082,065,985	2,044,257,186
Investment Income				
Net appreciation				
in fair value of investments	736,031,971	162,649,839	898,681,810	1,467,434,542
Interest	155,798,932	-	155,798,932	127,396,974
Dividends	237,287,406	-	237,287,406	232,971,148
Securities lending	5,191,144	-	5,191,144	4,741,875
Gross Investment Income	1,134,309,453	162,649,839	1,296,959,292	1,832,544,539
Less investment expense				
Asset management expense	64,109,736	-	64,109,736	73,281,987
Securities lending expense	468,824	-	468,824	426,769
Net investment income	1,069,730,893	162,649,839	1,232,380,732	1,758,835,783
Total additions	2,991,992,939	322,453,778	3,314,446,717	3,803,092,969
Deductions				
Benefits	2,558,990,197	58,206,662	2,617,196,859	2,497,944,964
Refunds of contributions	80,538,398	34,513,261	115,051,659	123,842,578
Administrative expense	16,083,589	579,285	16,662,874	14,848,138
Total deductions	2,655,612,184	93,299,208	2,748,911,392	2,636,635,680
Net increase	336,380,755	229,154,570	565,535,325	1,166,457,289
Plan Net Position				
Beginning of year	19,321,075,501	2,500,452,464	21,821,527,965	20,655,070,676
End of Year	$ 19,657,456,256	$ 2,729,607,034	$ 22,387,063,290	21,821,527,965

APPENDIX B

MEMBERSHIP DATA

Table 3A
Summary of Data Characteristics – Active, Inactive, Retired
($ in Millions)

	June 30, 2018		June 30, 2019	
	Number	Earnings	Number	Earnings
Active Members				
Full time				
Traditional SURS	41,710	$2,188.6	41,801	$2,212.0
Portable SURS	17,270	1,144.5	17,192	1,158.4
SMP	11,656	898.9	12,118	956.4
Total Full Time [1]	70,636	$4,232.0	71,111	$4,326.9
Part time				
Traditional SURS	3,290	$ 23.1	3,124	$ 21.6
Portable SURS	574	4.9	472	4.2
SMP	450	4.4	413	3.9
Total Part Time	4,314	$ 32.3	4,009	$ 29.7
Total	74,950	$4,264.3	75,120	$4,356.6
Inactive Members				
Traditional SURS	69,618		70,114	
Portable SURS	12,497		12,930	
SMP	9,759		10,033	
Total	91,874		93,077	

[1] *Includes 687 police officers and firefighters (including SMP) as of June 30, 2018, and 677 as of June 30, 2019.*

	Number	Annual Benefits	Number	Annual Benefits
Benefit Recipients				
Retirement				
Traditional SURS	49,909	$ 2,035.3	50,900	$ 2,110.9
Portable SURS	6,384	216.0	6,990	244.3
Total Retirement	56,293	$ 2,251.3	57,890	$ 2,355.2
Survivor				
Traditional SURS	8,615	$ 167.7	8,720	$ 177.9
Portable SURS	229	4.1	253	5.0
Total Survivor	8,844	$ 171.8	8,973	$ 182.8
Disability				
Traditional SURS	832	$ 17.6	795	$ 17.5
Portable SURS	200	5.3	184	4.9
Total Disability	1,032	$ 23.0	979	$ 22.4
Total	66,169	$ 2,446.1	67,842	$ 2,560.4
Total Participants				
Total Traditional SURS	173,974		175,454	
Total Portable SURS	37,154		38,021	
Total SMP	21,865		22,564	
Total	232,993		236,039	

Values may not add due to rounding.

Table 3B
Summary of Data Characteristics – Full Time Active
($ in Millions)

	June 30, 2018		June 30, 2019	
	Number	Earnings	Number	Earnings
Active Members				
Full time				
Continuing Actives - Tier 1				
Traditional SURS	27,555	$1,660.0	25,622	$1,591.3
Portable SURS	10,693	806.0	9,943	775.6
SMP	5,762	470.9	5,490	465.4
Total	44,010	$2,936.8	41,055	$2,832.3
Continuing Actives - Tier 2				
Traditional SURS	10,806	$458.1	12,206	$530.0
Portable SURS	5,445	299.9	5,945	338.3
SMP	4,812	376.8	5,422	433.6
Total	21,063	$1,134.8	23,573	$1,301.9
New Actives - Tier 1				
Traditional SURS	370	$8.8	456	$11.8
Portable SURS	87	2.5	94	3.2
SMP	67	2.5	67	2.2
Total	524	$13.7	617	$17.3
New Actives - Tier 2				
Traditional SURS	2,979	$61.7	3,517	$79.0
Portable SURS	1,045	36.1	1,210	41.3
SMP	1,015	48.8	1,139	55.2
Total	5,039	$146.7	5,866	$175.5
Total Actives - Tier 1				
Traditional SURS	27,925	$1,668.8	26,078	$1,603.1
Portable SURS	10,780	808.4	10,037	778.8
SMP	5,829	473.3	5,557	467.6
Total	44,534	$2,950.5	41,672	$2,849.5
Total Actives - Tier 2				
Traditional SURS	13,785	$519.8	15,723	$609.0
Portable SURS	6,490	336.0	7,155	379.6
SMP	5,827	425.6	6,561	488.8
Total	26,102	$1,281.4	29,439	$1,477.4
Total Actives - Tier 1 and Tier 2				
Traditional SURS	41,710	$2,188.6	41,801	$2,212.0
Portable SURS	17,270	1,144.5	17,192	1,158.4
SMP	11,656	898.9	12,118	956.4
Total	70,636	$4,232.0	71,111	$4,326.9

Values may not add due to rounding.

Table 3C
Summary of Data Characteristics – Part Time Active/Inactive
($ in Millions)

	June 30, 2018		June 30, 2019	
	Number	Earnings	Number	Earnings
Active Members				
Part time				
Total Actives - Tier 1				
Traditional SURS	997	$6.6	900	$6.0
Portable SURS	170	1.2	135	1.0
SMP	108	0.9	101	0.8
Total	1,275	$8.7	1,136	$7.8
Total Actives - Tier 2				
Traditional SURS	2,293	$16.5	2,224	$15.6
Portable SURS	404	3.6	337	3.2
SMP	342	3.5	312	3.1
Total	3,039	$23.6	2,873	$21.9
Total Actives - Tier 1 and Tier 2				
Traditional SURS	3,290	$23.1	3,124	$21.6
Portable SURS	574	4.9	472	4.2
SMP	450	4.4	413	3.9
Total	4,314	$32.3	4,009	$29.7
Inactive Members				
Total Inactives - Tier 1				
Traditional SURS	57,459		56,142	
Portable SURS	9,395		9,275	
SMP	7,219		7,055	
Total	74,073		72,472	
Total Inactives - Tier 2				
Traditional SURS	12,159		13,972	
Portable SURS	3,102		3,655	
SMP	2,540		2,978	
Total	17,801		20,605	
Total Inactives - Tier 1 and Tier 2				
Traditional SURS	69,618		70,114	
Portable SURS	12,497		12,930	
SMP	9,759		10,033	
Total	91,874		93,077	

Values may not add due to rounding.

Table 4
Distribution of Full-Time Active Members by Age and Years of Service
as of June 30, 2019

	Years of Service								
Age	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30 & Over	Totals
Under 20	16	11	-	-	-	-	-	-	27
	$ 83,747	$ 172,948	$ -	$ -	$ -	$ -	$ -	$ -	$ 256,695
20-24	380	739	10	-	-	-	-	-	1,129
	$ 3,699,871	$ 21,500,894	$ 310,542	$ -	$ -	$ -	$ -	$ -	$ 25,511,307
25-29	731	3,281	555	7	-	-	-	-	4,574
	$ 9,350,186	$ 135,814,388	$ 23,590,720	$ 266,230	$ -	$ -	$ -	$ -	$ 169,021,525
30-34	641	3,888	2,276	433	15	-	-	-	7,253
	$ 10,688,296	$ 202,412,738	$ 121,127,645	$ 23,717,028	$ 760,111	$ -	$ -	$ -	$ 358,705,819
35-39	470	3,049	3,032	1,681	427	11	-	-	8,670
	$ 7,717,267	$ 170,157,860	$ 182,872,244	$ 106,965,373	$ 26,648,540	$ 804,130	$ -	$ -	$ 495,165,415
40-44	342	2,275	2,542	2,109	1,333	354	10	-	8,965
	$ 6,086,585	$ 125,756,355	$ 163,699,466	$ 153,774,509	$ 96,345,637	$ 25,337,503	$ 691,357	$ -	$ 571,691,413
45-49	315	1,783	2,099	2,033	1,733	1,112	324	9	9,408
	$ 4,866,786	$ 88,414,440	$ 127,571,641	$ 150,143,319	$ 140,308,564	$ 88,022,544	$ 25,405,126	$ 573,005	$ 625,305,425
50-54	243	1,463	1,889	1,740	1,739	1,394	853	180	9,501
	$ 4,372,776	$ 71,842,486	$ 103,775,618	$ 119,724,859	$ 136,710,609	$ 121,061,761	$ 69,410,756	$ 14,426,095	$ 641,324,959
55-59	208	1,233	1,699	1,698	1,687	1,417	950	424	9,316
	$ 4,045,617	$ 62,108,753	$ 90,576,024	$ 108,053,714	$ 127,814,067	$ 117,631,674	$ 91,452,652	$ 40,965,438	$ 642,647,938
60-64	103	807	1,313	1,275	1,266	1,004	737	429	6,934
	$ 1,639,452	$ 37,727,696	$ 67,048,656	$ 74,429,848	$ 88,786,582	$ 78,893,903	$ 71,623,533	$ 50,222,946	$ 470,372,616
65 & Over	49	525	1,000	1,046	968	717	589	440	5,334
	$ 797,120	$ 19,126,357	$ 38,781,685	$ 52,813,650	$ 64,017,604	$ 49,833,785	$ 45,703,565	$ 55,857,287	$ 326,931,052
Total Count	3,498	19,054	16,415	12,022	9,168	6,009	3,463	1,482	71,111
Total Payroll	$ 53,347,702	$ 935,034,917	$ 919,354,241	$ 789,888,530	$ 681,391,714	$ 481,585,300	$ 304,286,989	$ 162,044,770	$ 4,326,934,164

Includes the use of capped payroll for defined benefit plan members hired on or after January 1, 2011. Includes SMP.

Table 5
Distribution of Benefit Recipients by Age
as of June 30, 2019

Age	Number	Annual Benefit
Retirees and Survivors		
Under 50	442	$ 3,993,961
50-54	453	16,950,451
55-59	3,461	119,445,022
60-64	8,685	311,953,862
65-69	14,052	512,692,881
70-74	14,279	550,367,395
75-79	10,831	461,131,706
80-84	7,165	295,173,780
85-89	4,482	172,758,471
90 & Over	3,013	93,571,057
Total	66,863	$ 2,538,038,586
Disabilitants		
Under 50	133	$ 3,202,908
50-54	108	2,821,484
55-59	206	4,726,247
60-64	209	5,094,020
65-69	172	3,619,675
70-74	81	1,695,578
75-79	38	738,882
80-84	17	263,561
85-89	10	157,817
90 & Over	5	72,377
Total	979	$ 22,392,549

Excludes SMP.

APPENDIX C

ACTUARIAL DETERMINATIONS

Table 6
Summary of Actuarial Values
as of June 30, 2019
($ in Millions)

	Actuarial Present Value of Projected Benefits (APV)	Projected Unit Credit Values: Actuarial Accrued Liability (AAL)	Projected Unit Credit Values: Gross Normal Cost (NC) [1]	Gross NC % of Pay [1]
1. Active Members				
a. Retirement	$14,753.7	$ 9,898.9	$534.5	15.18%
b. Death	280.0	181.3	11.6	0.33%
c. Disability	259.2	159.6	15.6	0.44%
d. Termination	2,140.6	1,357.4	146.4	4.16%
Total - Active Members	$17,433.5	$ 11,597.3	$708.1	20.11%
2. Benefit Recipients				
a. Retirement	$29,859.0	$29,859.0	$ 0.0	
b. Survivor	1,724.3	1,724.3	0.0	
c. Disability	273.2	273.2	0.0	
Total - Benefit Recipients	$31,856.5	$31,856.5	$ 0.0	
3. Other Inactive	$ 2,990.2	$ 2,990.2		
4. Grand Total	$52,280.2	$46,443.9	$708.1	20.11%
5. Operating Expense			$ 21.2	0.60%
6. Total Normal Cost [2]			$729.3	20.71%
7. Expected Pay During Fiscal Year 2020 for Defined Benefit Plans[1]				$ 3,521.7
8. Present Value of Future Salaries (PVFS) [1]				$ 27,305.9

[1] For members currently active as of June 30, 2019, in the Traditional and Portable defined benefit plans and includes the use of capped payroll for members hired on or after January 1, 2011.
[2] The normal cost as a percent of pay is 25.21% for Tier 1 members and 10.97% for Tier 2 members.

Excludes SMP.

Values may not add due to rounding.

Table 7
Defined Benefit Plan Development of the Actuarial Value of Assets
for the Year Ending June 30, 2019

	2018	2019	2020	2021	2022	2023
Beginning of Year:						
(1) Market Value of Assets	$ 18,484,819,578	$ 19,321,075,501				
(2) Actuarial Value of Assets	18,594,326,238	19,347,886,135				
End of Year:						
(3) Market Value of Assets	19,321,075,501	19,657,456,256				
(4) Net of Contributions and Disbursements	(663,573,533)	(733,350,138)				
(5) Total Investment Income						
=(3)-(1)-(4)	1,499,829,456	1,069,730,893				
(6) Projected Rate of Return	7.25%	6.75%				
(7) Projected Investment Income						
=(1)x(6)+([1+(6)]^.5-1)x(4)	1,316,515,744	1,279,826,167				
(8) Investment Income in						
Excess of Projected Income	183,313,712	(210,095,274)				
(9) Excess Investment Income Recognized						
This Year (5 year recognition)						
(9a) From This Year	36,662,742	(42,019,055)				
(9b) From One Year Ago	155,949,656	36,662,742	$ (42,019,055)			
(9c) From Two Years Ago	(246,425,206)	155,949,656	36,662,742	$ (42,019,055)		
(9d) From Three Years Ago	(148,460,161)	(246,425,206)	155,949,656	36,662,742	$ (42,019,055)	
(9e) From Four Years Ago	302,890,655	(148,460,159)	(246,425,207)	155,949,656	36,662,744	$ (42,019,054)
(9f) Total Recognized Investment Gain/(Loss)	100,617,686	(244,292,022)	(95,831,864)	150,593,343	(5,356,311)	(42,019,054)
(10) Change in Actuarial Value of Assets						
=(4)+(7)+(9f)	753,559,897	302,184,007				
End of Year:						
(3) Market Value of Assets	**19,321,075,501**	**19,657,456,256**				
(11) Final Actuarial Value of Assets	**19,347,886,135**	**19,650,070,142**				
(12) Difference Between Market & Actuarial Values	(26,810,634)	7,386,114				
(13) Actuarial Value Rate of Return	7.76 %	5.46 %				
(14) Estimated Market Value Rate of Return	8.26 %	5.64 %				
(15) Ratio of Actuarial Value to Market Value	100 %	100 %				
(16) SURS Reported Market Value Rate of Return	8.25 %	6.07 %				

Excludes SMP.

Table 8
Analysis of Change in
Actuarial Accrued Liability and Actuarial Value of Assets
for the Year Ending June 30, 2019
($ in Millions)

1. Actuarial (Gain)/Loss on Actuarial Accrued Liability ("AAL")		
(a) AAL 6/30/2018		$ 45,258.8
(b) Normal Cost FY 2019	$ 730.3	
(c) Benefits and Admin Expenses Paid FY 2019	(2,655.6)	
(d) Interest on (a), (b), and (c) at 6.75%	2,991.0	
(e) Expected AAL 6/30/2019 (a+b+c+d)		46,324.5
(f) Actual AAL 6/30/2019 Before Assumption and Method Changes		46,443.9
(g) Actuarial (Gain)/Loss on AAL (f-e)		$ 119.5
(h) Impact of Benefit Changes		0.0
(i) Impact of Change in Actuarial Assumptions and Methods		0.0
(j) Actual AAL After Changes (f+h+i)		$ 46,443.9
2. Actuarial (Gain)/Loss on Assets		
(a) Actuarial Value of Assets 6/30/2018		$ 19,347.9
(b) Contributions FY 2019	1,922.3	
(c) Benefits and Administrative Expenses	(2,655.6)	
(d) Interest on (a), (b), and (c) at 6.75%	1,281.6	
(e) Expected Assets 6/30/2019 (a+b+c+d)		$ 19,896.2
(f) Actual Actuarial Value of Assets 6/30/2019		19,650.1
(g) Actuarial (Gain)/Loss on Assets (e-f)		$ 246.1
3. Total Actuarial (Gain)/Loss		
(a) (Gain)/Loss on AAL		$ 119.5
(b) (Gain)/Loss on Assets		246.1
(c) Net (Gain)/Loss (a+b)		$ 365.6

Excludes SMP.

Values may not add due to rounding.

Table 9
Analysis of Change in
Unfunded Actuarial Accrued Liability
for the Year Ending June 30, 2019
($ in Millions)

1.	Unfunded Actuarial Accrued Liability (UAAL) at 06/30/2018	$	25,910.9
2.	Contributions		
	a. Contributions equal to normal cost plus interest on UAAL		
	i Interest on 1)	$	1,749.0
	ii Member contributions		280.0
	iii Employer/State normal cost		450.2
	iv Interest on ii and iii		24.2
	v Total due	$	2,503.5
	b. Contributions paid based on funding policy		
	i Member contributions	$	280.0
	ii Employer/State contributions		1,642.2
	iii Interest on i and ii		63.8
	iv Total paid	$	1,986.1
	c. Expected increase in UAAL (2a.v-2b.iv)		517.4
3.	Expected UAAL at 06/30/2019 (1+2c)		26,428.3
4.	(Gains)/Losses		
	a. Investment income	$	246.1
	b. Salary increases		(55.2)
	c. Demographic and other		174.7
	d. Total	$	365.6
5.	Plan Provision Changes		-
6.	Assumption Changes		-
7.	Total Change in UAAL (2c + 4d + 5 + 6)		883.0
8.	UAAL at 06/30/2019 (1 + 7)	$	26,793.9

Excludes SMP.

Values may not add due to rounding.

Table 10
Analysis of Actuarial (Gains) and Losses
($ in Millions)

	Amount of (Gain) or Loss			
	FY 2016	FY 2017	FY 2018	FY 2019
Investment Return[1]	$ 151.8	$ (142.8)	$ (92.7)	$ 246.1
Salary Increase	(135.0)	(144.7)	(8.5)	(55.2)
Age and Service Retirement	59.3	(26.0)	16.1	53.4
General Employment Termination	5.7	10.7	15.3	29.3
Disability Incidence	3.0	0.3	5.4	4.5
In Service Mortality	(3.7)	(7.3)	(3.4)	(5.5)
Benefit Recipient[2]	68.2	14.2	20.1	41.8
New Entrants[3]	63.2	84.1	76.6	87.1
Data Refinements[4]	NA	(152.9)	0.0	0.0
Other[5]	129.5	(28.8)	(13.6)	(35.9)
Total Actuarial (Gain)/Loss	$ 342.0	$ (393.2)	$ 15.3	$ 365.6
BOY Actuarial Accrued Liability (AAL)	$ 39,520.7	$ 40,923.3	$ 41,853.3	$ 45,258.8
(Gain)/Loss as a % of BOY AAL	0.9%	(1.0)%	0.0%	0.8%
Total Non-Investment (Gain)/Loss	$ 190.2	$ (250.4)	$ 108.0	$ 119.5
(Gain)/Loss as a % of BOY AAL	0.5%	(0.6)%	0.3%	0.3%

Excludes SMP.

[1]*Gain/Loss is based on actuarial value of assets.*

[2]*Benefit recipient (gain)/loss includes mortality gains and losses as well as gains and losses due to unexpected changes in benefit amounts from year to year. Unexpected changes may occur when benefits that are initially paid as preliminary estimates are finalized. Mortality gains and losses include deviations in the assumed demographics of future beneficiaries compared to the actual demographics of new beneficiaries.*

Beginning with the actuarial valuation as of June 30, 2011, there is an additional load of 10% on the liabilities of those retirees who are currently receiving benefits as a preliminary estimate. Beginning with the actuarial valuation as of June 30, 2015, the load of 10% was reduced to 5% for retirees who are currently receiving benefits as a preliminary estimate for whom Staff provided a best formula benefit.

[3]*Only includes liability for new entrants. Does not include the impact of new entrant contributions.*

[4]*In the actuarial valuation as of June 30, 2017, a new data field was used to estimate money purchase benefit amounts, which reflects the Effective Rate of Interest (ERI) declared by the State Comptroller (which differs from the ERI declared by the SURS Board).*

[5]*Includes other experience such as deviations between actual and expected benefit payments and refunds that were not easily attributable to one of the categories above.*

Table 11

Funded Ratio and Illustrative Contributions under Funding Policy of Net Normal Cost Plus Level Percentage of Payroll Amortization of Unfunded Liability

($ in Millions)

Fiscal Year	DB Payroll [1]	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL)	Funded Ratio	Total Normal Cost	Member Contributions [2]	Amortization of UAAL (30-year open) [3]	Net State Contribution (30-year open) [3]	Amortization of UAAL (30-year closed) [4]	Net State Contribution (30-year closed) [4]	Net State 30-year closed with 1 year Interest Adjustment [4]
2015	$3,606.537	$17,104.607	$39,520.687	$22,416.080	43.28 %	$730.020	$267.682	$1,160.318	$1,622.656			
2016	3,513.108	17,701.646	40,923.301	23,221.655	43.26	739.549	278.884	1,205.004	1,665.669	$1,350.394	$1,811.060	$1,942.361
2017	3,458.320	18,594.326	41,853.348	23,259.022	44.43	719.225	278.643	1,248.309	1,688.891	1,424.261	1,864.843	2,000.044
2018	3,470.226	19,347.886	45,258.751	25,910.865	42.75	701.871	282.726	1,250.317	1,669.462	1,442.888	1,862.033	1,997.030
2019	3,506.650	19,650.070	46,443.937	26,793.867	42.31	730.265	280.018	1,392.034	1,842.281	1,789.119	2,239.366	2,390.524
2020						729.332	284.589	1,414.928	1,859.671	1,852.937	2,297.680	2,452.773

[1] Defined Benefit Plan payroll is rolled forward with one year of salary scale at 3.25% (3.75% prior to fiscal year 2018) and uses capped payroll for members hired on and after January 1, 2011.
[2] Projected for Fiscal Year 2020 and actual for years prior to Fiscal Year 2020.
[3] A 30-year open period amortization policy is not a funding policy recommended by GRS. This illustrative contribution was included at the request of the Governor's Office. The amortization payment was calculated as a level percentage of total uncapped payroll (assumed to increase by 3.25% each year, 3.75% for years prior to Fiscal Year 2019).
[4] GRS recommends a 30-year (or shorter) closed amortization period beginning with Fiscal Year 2015, 25 years remaining at Fiscal Year 2020. (The statutory contribution would apply to Fiscal Year 2021; therefore a one year interest adjustment was applied). The amortization payment was calculated as a level percentage of defined benefit plan pensionable (capped) payroll.

APPENDIX D

ACTUARIAL PROJECTIONS

Table 12

Baseline Projections – Actuarial Valuation June 30, 2019

Assumes Contributions Based on Table 14 & Investment Return of 6.75% Each Year

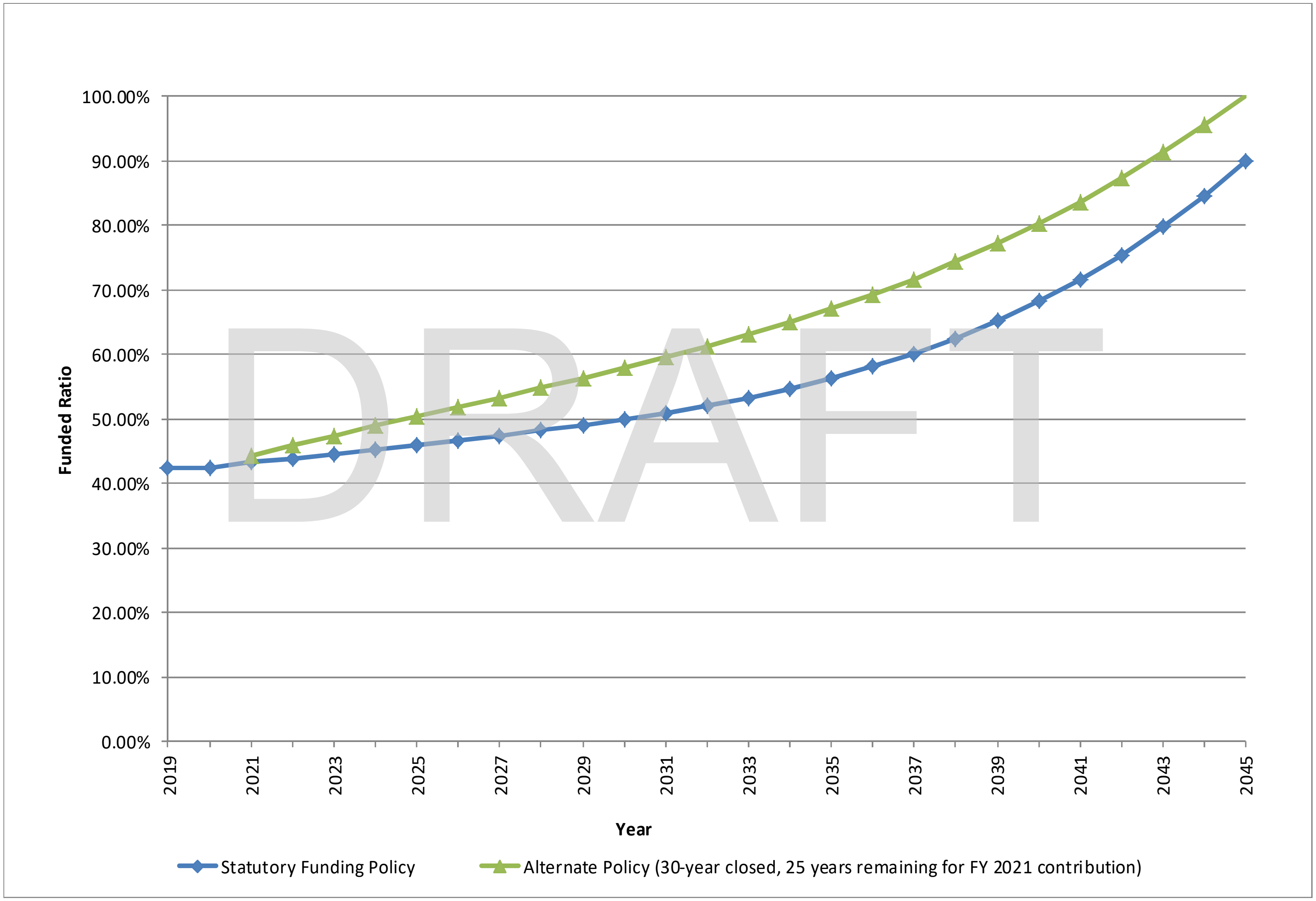
($ in Millions)

Fiscal Year Ending	Total Payroll[1]	SMP Payroll	DB Payroll[1]	SURS Contributions[2]	Member Contributions	Benefits	Expenses	Assets EOY	AAL	Funding Ratio	UAAL	Debt Service	Maximum Contribution[3]	SURS Contribution % of Total Payroll
2019	$ 4,356.631	$ 960.360	$ 3,396.271	$ 1,642.244	$ 280.018	$ 2,639.529	$ 16.084	$ 19,650.070	$ 46,443.937	42.31 %	$ 26,793.867	$ 123.920	$ 1,654.099	37.70 %
2020	4,600.719	1,047.792	3,552.927	1,827.623	284.589	2,846.863	21.207	20,100.166	47,369.162	42.43	27,268.996	132.009	1,847.254	39.72
2021	4,667.191	1,098.034	3,569.157	1,959.227	285.889	2,902.924	21.896	20,912.218	48,286.220	43.31	27,374.002	139.615	1,970.778	41.98
2022	4,747.502	1,151.369	3,596.133	2,032.834	288.050	3,000.980	22.608	21,589.207	49,152.541	43.92	27,563.334	146.736	2,036.297	42.82
2023	4,839.091	1,205.894	3,633.197	2,090.870	291.019	3,099.622	23.343	22,235.945	49,965.465	44.50	27,729.520	153.373	2,092.543	43.21
2024	4,934.865	1,260.620	3,674.245	2,158.593	294.307	3,204.411	24.101	22,935.509	50,715.242	45.22	27,779.734	164.417	2,158.593	43.74
2025	5,034.169	1,315.869	3,718.300	2,198.221	297.836	3,311.964	24.885	23,614.950	51,395.291	45.95	27,780.341	174.604	2,198.221	43.67
2026	5,137.290	1,370.888	3,766.402	2,242.281	301.689	3,419.703	25.693	24,277.606	52,001.680	46.69	27,724.074	179.149	2,242.281	43.65
2027	5,246.348	1,426.914	3,819.434	2,289.639	305.937	3,523.203	26.528	24,930.512	52,535.015	47.46	27,604.503	183.195	2,289.639	43.64
2028	5,361.093	1,483.613	3,877.480	2,335.284	310.586	3,625.186	27.390	25,573.193	52,993.062	48.26	27,419.869	191.634	2,335.284	43.56
2029	5,479.091	1,540.933	3,938.158	2,383.210	315.446	3,728.638	28.281	26,205.988	53,370.088	49.10	27,164.100	199.325	2,383.210	43.50
2030	5,599.713	1,598.763	4,000.950	2,428.230	320.476	3,826.810	29.200	26,830.828	53,666.152	50.00	26,835.324	211.160	2,428.230	43.36
2031	5,725.291	1,659.129	4,066.161	2,476.583	325.700	3,925.337	30.149	27,450.421	53,875.415	50.95	26,424.994	221.997	2,476.583	43.26
2032	5,856.876	1,722.326	4,134.550	2,533.659	331.177	4,012.152	31.129	28,085.757	54,004.419	52.01	25,918.662	226.944	2,533.659	43.26
2033	5,995.312	1,787.883	4,207.428	2,599.604	337.015	4,091.747	32.140	28,754.861	54,056.370	53.19	25,301.509	226.249	2,599.604	43.36
2034	6,139.477	1,855.619	4,283.858	2,700.300	343.137	4,165.774	33.185	29,501.930	54,033.047	54.60	24,531.117	NA	2,893.805	43.98
2035	6,288.298	1,925.203	4,363.094	2,765.755	349.484	4,165.381	34.263	30,372.905	54,006.915	56.24	23,634.010	NA	2,963.950	43.98
2036	6,440.819	1,996.254	4,444.565	2,832.838	356.010	4,221.956	35.377	31,319.117	53,919.315	58.09	22,600.197	NA	3,035.840	43.98
2037	6,597.671	2,069.257	4,528.414	2,901.825	362.726	4,272.124	36.527	32,354.396	53,773.185	60.17	21,418.789	NA	3,109.771	43.98
2038	6,759.718	2,144.544	4,615.174	2,973.098	369.675	4,316.834	37.714	33,492.953	53,570.963	62.52	20,078.009	NA	3,186.151	43.98
2039	6,927.107	2,221.629	4,705.478	3,046.720	376.909	4,351.124	38.940	34,755.209	53,320.961	65.18	18,565.752	NA	3,265.049	43.98
2040	7,099.509	2,300.875	4,798.634	3,122.547	384.371	4,377.265	40.205	36,160.403	53,029.978	68.19	16,869.575	NA	3,346.310	43.98
2041	7,278.983	2,382.518	4,896.464	3,201.484	392.207	4,392.157	41.512	37,733.366	52,709.190	71.59	14,975.824	NA	3,430.904	43.98
2042	7,463.961	2,466.700	4,997.261	3,282.842	400.281	4,393.358	42.861	39,502.270	52,373.272	75.42	12,871.001	NA	3,518.092	43.98
2043	7,654.002	2,552.632	5,101.370	3,366.427	408.620	4,383.299	44.254	41,494.505	52,034.974	79.74	10,540.469	NA	3,607.666	43.98
2044	7,848.042	2,640.546	5,207.496	3,451.771	417.120	4,365.124	45.692	43,735.468	51,704.267	84.59	7,968.799	NA	3,699.126	43.98
2045	8,045.470	2,730.749	5,314.721	3,538.605	425.709	4,336.655	47.177	46,254.166	51,393.518	90.00	5,139.352	NA	3,792.182	43.98

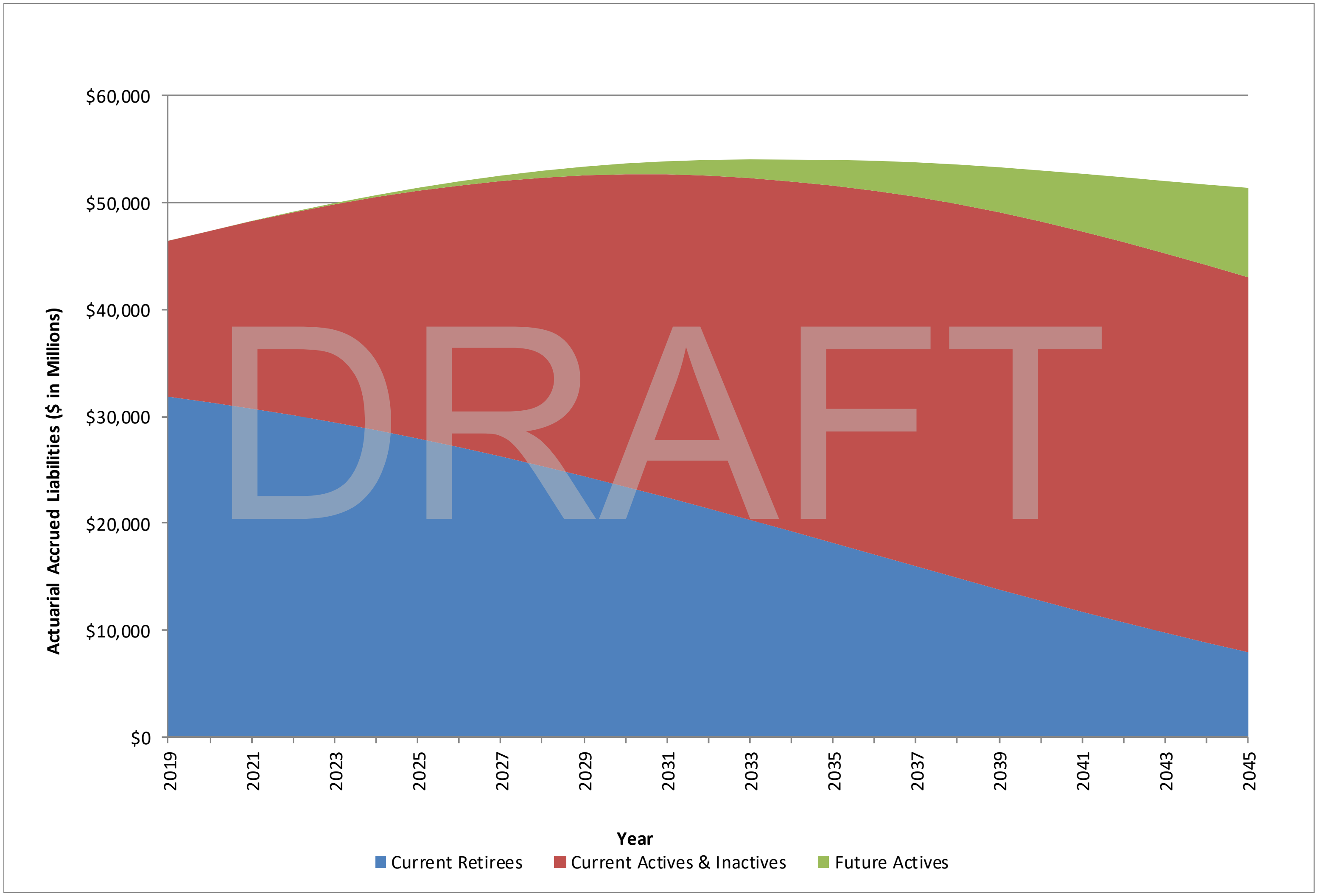
Projections are based on 70% of new hires electing Tier 2 and 30% electing SMP and 75,120 total active members (71,111 full time and 4,009 part time) in each future year.

[1] Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.
[2] Excludes SMP contributions. Includes employer contributions.
[3] Maximum contribution after impact of debt service.

Graph 1
Projected Funded Ratio Based on Statutory Contributions
Actuarial Valuation as of June 30, 2019
($ in Millions)



Graph 2
Projected Actuarial Accrued Liabilities
Actuarial Valuation as of June 30, 2019
($ in Millions)



Graph 3
Projected Benefit Payments
Actuarial Valuation as of June 30, 2019
($ in Millions)

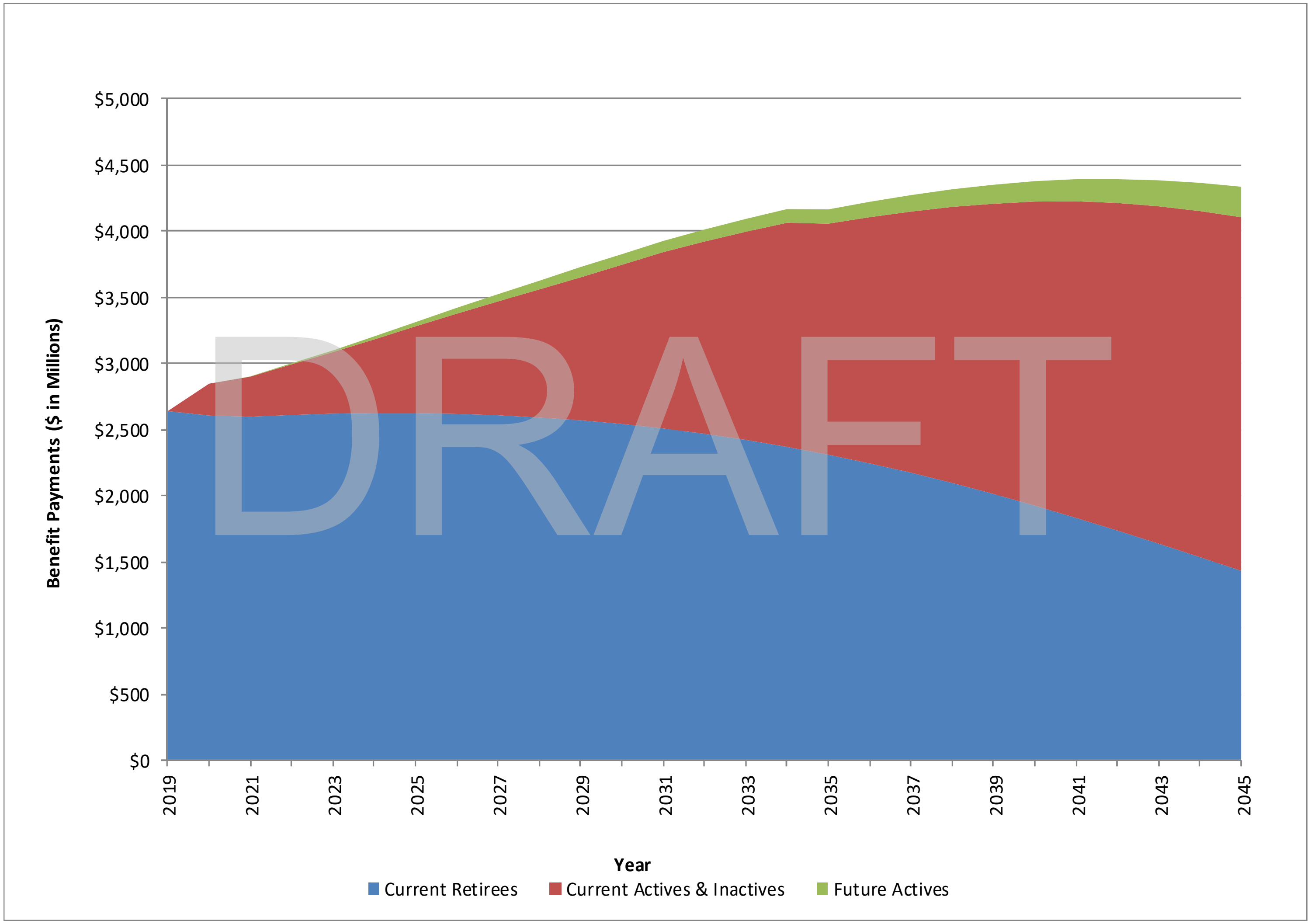


Table 13
Projected Statutory Contributions for the Actuarial Valuation as of June 30, 2019
Before Impact of Bonds Issued in 2004
($ in Millions)

			70% of New Members to Tier 2, 30% to SMP	
			Combined State and Employer Contribution	
FYE	SURS Cont.	SMP Cont.	$	% of Pay [1]
2020	$ 1,979.264	$ 72.288	$ 2,051.552	44.59 %
2021	2,110.393	77.488	2,187.881	46.88
2022	2,183.033	81.530	2,264.563	47.70
2023	2,245.916	85.382	2,331.298	48.18
2024	2,323.010	89.249	2,412.259	48.88
2025	2,372.824	93.153	2,465.977	48.98
2026	2,421.430	97.042	2,518.472	49.02
2027	2,472.834	101.003	2,573.837	49.06
2028	2,526.918	105.011	2,631.929	49.09
2029	2,582.536	109.064	2,691.600	49.12
2030	2,639.390	113.153	2,752.543	49.16
2031	2,698.580	117.422	2,816.002	49.19
2032	2,760.602	121.890	2,882.492	49.22
2033	2,825.853	126.525	2,952.378	49.24
2034	2,893.805	131.314	3,025.119	49.27
2035	2,963.950	136.234	3,100.184	49.30
2036	3,035.840	141.258	3,177.098	49.33
2037	3,109.771	146.420	3,256.191	49.35
2038	3,186.151	151.743	3,337.894	49.38
2039	3,265.049	157.194	3,422.243	49.40
2040	3,346.310	162.798	3,509.108	49.43
2041	3,430.904	168.572	3,599.476	49.45
2042	3,518.092	174.525	3,692.617	49.47
2043	3,607.666	180.602	3,788.268	49.49
2044	3,699.126	186.820	3,885.946	49.51
2045	3,792.182	193.200	3,985.382	49.54
Total	$73,991.429	$3,320.880	$77,312.309	

[1] *Percent of pay amounts are calculated based on pensionable pay. Pensionable pay does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.*

Table 14
Projected Statutory Contributions for the Actuarial Valuation as of June 30, 2019
Including Impact of Bonds Issued in 2004
($ in Millions)

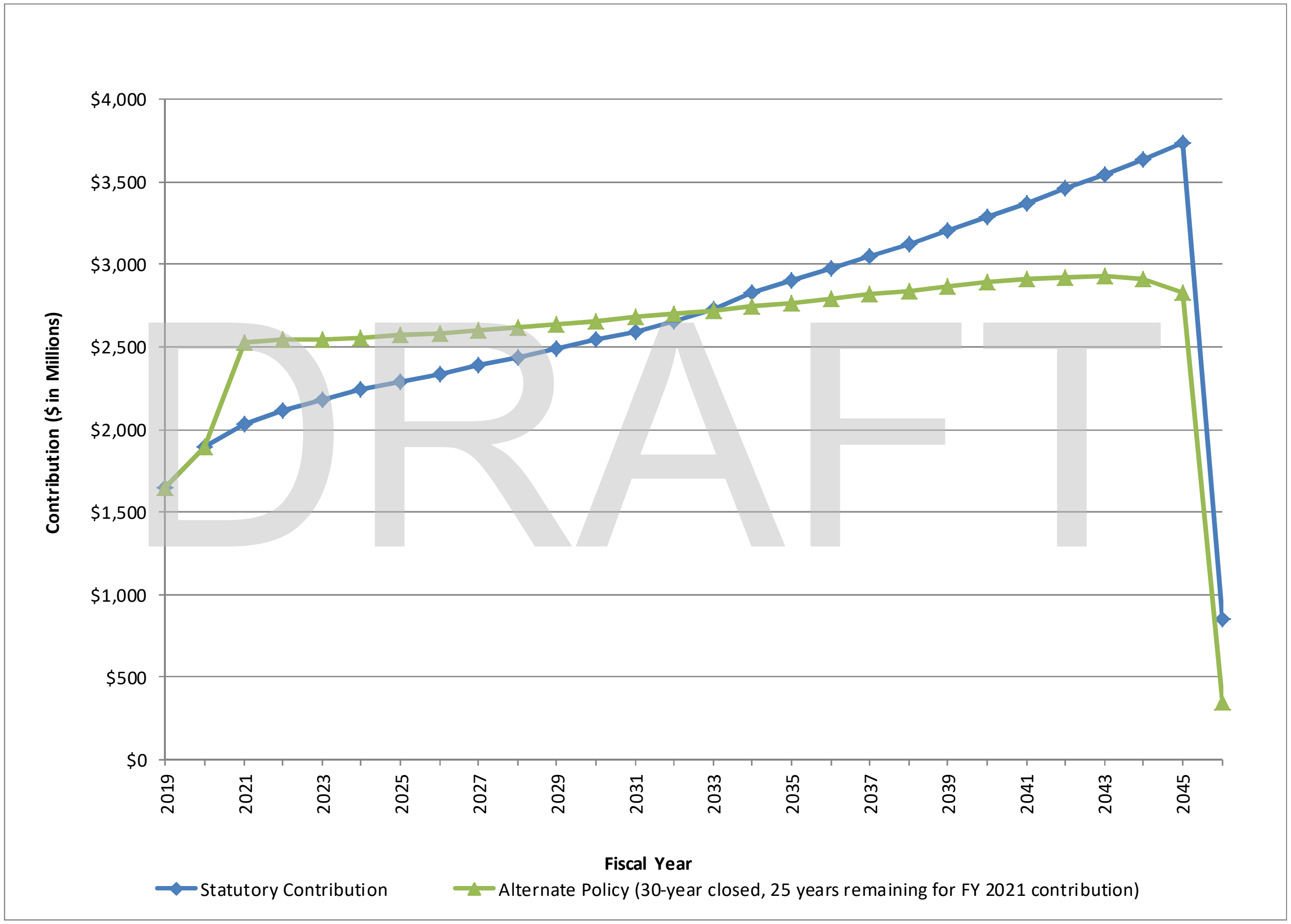
	70% of New Members to Tier 2, 30% to SMP											
			Combined State and Employer Contribution		Debt Service		SURS Alternate Policy Contribution [2]		Projected % of Alternate Policy Contributed [3]	Employer Contributions	Federal/Trust Fund Contributions	Qualified Plan State Contribution
FYE	SURS Cont.	SMP Cont.	$	% of Pay [1]	$	% of Pay [1]	SURS Cont.	Total (w/SMP)				
2020	$ 1,827.623	$ 72.288	$ 1,899.911	41.30 %	$ 132.009	2.87 %	$ 1,827.623	$ 1,899.911		$ 10.284	$ 52.000	$ 1,837.627
2021	1,959.227	77.488	2,036.715	43.64	139.615	2.99	2,452.773	2,530.261	80.49 %	5.529	52.500	1,978.686
2022	2,032.834	81.530	2,114.364	44.54	146.736	3.09	2,468.529	2,550.059	82.91	8.508	NA	2,105.856
2023	2,090.870	85.382	2,176.252	44.97	153.373	3.17	2,461.659	2,547.041	85.44	8.206	NA	2,168.046
2024	2,158.593	89.249	2,247.842	45.55	164.417	3.33	2,469.035	2,558.284	87.87	8.136	NA	2,239.706
2025	2,198.221	93.153	2,291.374	45.52	174.604	3.47	2,479.826	2,572.979	89.06	8.009	NA	2,283.365
2026	2,242.281	97.042	2,339.323	45.54	179.149	3.49	2,487.481	2,584.523	90.51	7.871	NA	2,331.452
2027	2,289.639	101.003	2,390.642	45.57	183.195	3.49	2,500.543	2,601.546	91.89	7.715	NA	2,382.927
2028	2,335.284	105.011	2,440.295	45.52	191.634	3.57	2,514.626	2,619.637	93.15	7.538	NA	2,432.757
2029	2,383.210	109.064	2,492.274	45.49	199.325	3.64	2,529.607	2,638.671	94.45	7.380	NA	2,484.894
2030	2,428.230	113.153	2,541.383	45.38	211.160	3.77	2,545.389	2,658.542	95.59	7.220	NA	2,534.163
2031	2,476.583	117.422	2,594.005	45.31	221.997	3.88	2,561.163	2,678.585	96.84	7.036	NA	2,586.969
2032	2,533.659	121.890	2,655.549	45.34	226.944	3.87	2,576.774	2,698.664	98.40	6.827	NA	2,648.722
2033	2,599.604	126.525	2,726.129	45.47	226.249	3.77	2,594.901	2,721.426	100.17	6.539	NA	2,719.590
2034	2,700.300	131.314	2,831.614	46.12			2,613.602	2,744.916	103.16	6.265	NA	2,825.349
2035	2,765.755	136.234	2,901.989	46.15			2,632.865	2,769.099	104.80	5.981	NA	2,896.008
2036	2,832.838	141.258	2,974.096	46.18			2,651.979	2,793.237	106.47	5.686	NA	2,968.410
2037	2,901.825	146.420	3,048.245	46.20			2,670.470	2,816.890	108.21	5.365	NA	3,042.880
2038	2,973.098	151.743	3,124.841	46.23			2,690.779	2,842.522	109.93	5.000	NA	3,119.841
2039	3,046.720	157.194	3,203.914	46.25			2,709.568	2,866.762	111.76	4.606	NA	3,199.308
2040	3,122.547	162.798	3,285.345	46.28			2,726.450	2,889.248	113.71	4.183	NA	3,281.162
2041	3,201.484	168.572	3,370.056	46.30			2,740.337	2,908.909	115.85	3.756	NA	3,366.300
2042	3,282.842	174.525	3,457.367	46.32			2,749.324	2,923.849	118.25	3.320	NA	3,454.047
2043	3,366.427	180.602	3,547.029	46.34			2,748.892	2,929.494	121.08	2.920	NA	3,544.109
2044	3,451.771	186.820	3,638.591	46.36			2,726.488	2,913.308	124.90	2.522	NA	3,636.069
2045	3,538.605	193.200	3,731.805	46.38			2,633.984	2,827.184	132.00	2.179	NA	3,729.626
Total	$ 68,740.070	$3,320.880	$ 72,060.950		$ 2,550.406		$ 66,764.665	$ 70,085.545		$ 158.579	$ 104.500	$ 71,797.871

[1] *Percent of pay amounts are calculated based on pensionable pay. Pensionable pay does not include amounts in excess of the pay caps applicable to members in the Tier 2 and Optional Hybrid Plan participating in the Traditional and Portable plans.*

[2] *Alternate funding policy of normal cost plus 30-year closed period amortization of the unfunded liability as a level percentage of defined benefit plan capped payroll beginning in FY 2016 with 25 years remaining as of FY 2021. Statutory Contribution is shown for FY 2020 for the Alternate funding policy contribution.*

[3] *Compares the SURS Statutory contribution (targets a funded ratio of 90% in 2045) against an alternate funding policy (targets a funded ratio of 100% in 2045).*

Graph 4
Projected Statutory Contributions vs. Contributions under Alternate Policy (Normal Cost Plus 30-year Closed Period Level Percent of Pay Amortization) (25 years remaining in Amortization Period for FY 2021 Contribution)
($ in Millions)



Alternate funding policy of normal cost plus 30-year closed period amortization of the unfunded liability as a level percentage of defined benefit plan capped payroll beginning in FY 2016 and 25 years remaining in FY 2021. Alternate funding policy contributions based on actual assets as of the current valuation date, the certified statutory contribution in the year following the current valuation date and the alternate policy contribution being made thereafter.

APPENDIX E

ADDITIONAL PROJECTION DETAILS

Table 15

Projections – Does Not Reflect Recognition of Deferred Asset Gains and Losses in Projected Actuarial Value of Assets (Impact of Bonds Issued in 2004 Included)

Assumes Investment Return of 6.75% Each Year on Actuarial Value of Assets

($ in Millions)

Fiscal Year Ending	Total Payroll[1]	SMP Payroll	DB Payroll[1]	SURS Contributions[2]	Member Contributions	Benefits	Expenses	Assets EOY	AAL	Funding Ratio	UAAL	Debt Service	Maximum Contribution[3]	SURS Contribution % of Total Payroll
2019	$ 4,356.631	$ 960.360	$ 3,396.271	$ 1,642.244	$ 280.018	$ 2,639.529	$ 16.084	$ 19,650.070	$ 46,443.937	42.31 %	$ 26,793.867	$ 123.920	$ 1,654.099	37.70 %
2020	4,600.719	1,047.792	3,552.927	1,827.623	284.589	2,846.863	21.207	20,195.499	47,369.162	42.63	27,173.663	132.009	1,847.254	39.72
2021	4,667.191	1,098.034	3,569.157	1,959.227	285.889	2,902.924	21.896	20,856.426	48,286.220	43.19	27,429.794	139.615	1,970.778	41.98
2022	4,747.502	1,151.369	3,596.133	2,024.749	288.050	3,000.980	22.608	21,529.849	49,152.541	43.80	27,622.692	146.736	2,030.356	42.65
2023	4,839.091	1,205.894	3,633.197	2,096.232	291.019	3,099.622	23.343	22,222.976	49,965.465	44.48	27,742.489	153.373	2,096.690	43.32
2024	4,934.865	1,260.620	3,674.245	2,162.254	294.307	3,204.411	24.101	22,925.447	50,715.242	45.20	27,789.795	164.417	2,162.254	43.82
2025	5,034.169	1,315.869	3,718.300	2,198.888	297.836	3,311.964	24.885	23,604.899	51,395.291	45.93	27,790.392	174.604	2,198.888	43.68
2026	5,137.290	1,370.888	3,766.402	2,242.962	301.689	3,419.703	25.693	24,267.579	52,001.680	46.67	27,734.101	179.149	2,242.962	43.66
2027	5,246.348	1,426.914	3,819.434	2,290.334	305.937	3,523.203	26.528	24,920.527	52,535.015	47.44	27,614.489	183.195	2,290.334	43.66
2028	5,361.093	1,483.613	3,877.480	2,335.994	310.586	3,625.186	27.390	25,563.267	52,993.062	48.24	27,429.795	191.634	2,335.994	43.57
2029	5,479.091	1,540.933	3,938.158	2,383.936	315.446	3,728.638	28.281	26,196.142	53,370.088	49.08	27,173.946	199.325	2,383.936	43.51
2030	5,599.713	1,598.763	4,000.950	2,428.972	320.476	3,826.810	29.200	26,821.083	53,666.152	49.98	26,845.068	211.160	2,428.972	43.38
2031	5,725.291	1,659.129	4,066.161	2,477.342	325.700	3,925.337	30.149	27,440.802	53,875.415	50.93	26,434.612	221.997	2,477.342	43.27
2032	5,856.876	1,722.326	4,134.550	2,534.434	331.177	4,012.152	31.129	28,076.291	54,004.419	51.99	25,928.128	226.944	2,534.434	43.27
2033	5,995.312	1,787.883	4,207.428	2,600.398	337.015	4,091.747	32.140	28,745.576	54,056.370	53.18	25,310.793	226.249	2,600.398	43.37
2034	6,139.477	1,855.619	4,283.858	2,701.292	343.137	4,165.774	33.185	29,493.043	54,033.047	54.58	24,540.004	NA	2,894.618	44.00
2035	6,288.298	1,925.203	4,363.094	2,766.771	349.484	4,165.381	34.263	30,364.467	54,006.915	56.22	23,642.448	NA	2,964.783	44.00
2036	6,440.819	1,996.254	4,444.565	2,833.878	356.010	4,221.956	35.377	31,311.185	53,919.315	58.07	22,608.130	NA	3,036.693	44.00
2037	6,597.671	2,069.257	4,528.414	2,902.891	362.726	4,272.124	36.527	32,347.029	53,773.185	60.15	21,426.156	NA	3,110.645	44.00
2038	6,759.718	2,144.544	4,615.174	2,974.190	369.675	4,316.834	37.714	33,486.217	53,570.963	62.51	20,084.745	NA	3,187.047	44.00
2039	6,927.107	2,221.629	4,705.478	3,047.839	376.909	4,351.124	38.940	34,749.174	53,320.961	65.17	18,571.787	NA	3,265.967	44.00
2040	7,099.509	2,300.875	4,798.634	3,123.693	384.371	4,377.265	40.205	36,155.145	53,029.978	68.18	16,874.833	NA	3,347.250	44.00
2041	7,278.983	2,382.518	4,896.464	3,202.660	392.207	4,392.157	41.512	37,728.968	52,709.190	71.58	14,980.222	NA	3,431.868	44.00
2042	7,463.961	2,466.700	4,997.261	3,284.048	400.281	4,393.358	42.861	39,498.821	52,373.272	75.42	12,874.451	NA	3,519.080	44.00
2043	7,654.002	2,552.632	5,101.370	3,367.663	408.620	4,383.299	44.254	41,492.100	52,034.974	79.74	10,542.874	NA	3,608.680	44.00
2044	7,848.042	2,640.546	5,207.496	3,453.039	417.120	4,365.124	45.692	43,734.210	51,704.267	84.59	7,970.056	NA	3,700.166	44.00
2045	8,045.470	2,730.749	5,314.721	3,539.904	425.709	4,336.655	47.177	46,254.166	51,393.518	90.00	5,139.352	NA	3,793.248	44.00

[1] Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.

[2] Excludes SMP contributions. Includes employer contributions.

[3] Maximum contribution after impact of debt service.

Table 16
Development of Market and Actuarial Value of Assets as of June 30, 2019 after Bonds (Valuation Basis) and before Bonds (Hypothetical Basis)

		After Bonds (Valuation Basis)	Before Bonds (Hypothetical)
1	Market Value at 6/30/2018	$19,321,075,501	$16,957,677,961
2a	Employer and Non-Employer Contributing Entity Contributions	1,642,244,428	1,778,018,656
2b	Member Contributions	280,017,618	280,017,618
2c	Benefits and Expenses	2,655,612,184	2,655,612,184
2d	Net Non-Investment Cash Flow	(733,350,138)	(597,575,910)
3	Investment Return (Based on Estimated Rate of 5.64%)	1,069,730,893	940,410,437
4	Expected Return (Based on Estimated Rate of 6.75%)	1,279,826,167	1,124,804,390
5	Market Value at 6/30/2019 (1+2d+3)	19,657,456,256	17,300,512,488
6	Expected Market Value at 6/30/2019 (1+2d+4)	19,867,551,530	17,484,906,441
7a	Actuarial Gain/(Loss) Current Year	(210,095,274)	(184,393,953)
7b	Actuarial Gain/(Loss) 1 Year Prior	183,313,712	161,071,013
7c	Actuarial Gain/(Loss) 2 Years Prior	779,748,280	680,927,833
7d	Actuarial Gain/(Loss) 3 Years Prior	(1,232,126,031)	(1,069,638,132)
7e	Actuarial Gain/(Loss) 4 Years Prior	(742,300,803)	(641,546,753)
8	Actuarial Value at 6/30/2018	19,347,886,135	16,976,429,034
9	Actuarial Value at 6/30/2019 (8+2d+4+.2*(7a+7b+7c+7d+7e))	19,650,070,142	17,292,941,516

Table 17
Hypothetical Assets to Determine Maximum Contribution
Projections – Reflects Recognition of Deferred Asset Gains and Losses in Projected Actuarial Value of Assets (Before Impact of Bonds Issued in 2004)
($ in Millions)

Fiscal Year Ending	Total Payroll[1]	SMP Payroll	DB Payroll[1]	SURS Contributions[2]	Member Contributions	Benefits	Expenses	Assets EOY	AAL	Funding Ratio	UAAL	Debt Service	SURS Contribution % of Total Payroll
2019	$ 4,356.631	$ 960.360	$ 3,396.271	$ 1,778.019	$ 280.018	$ 2,639.529	$ 16.084	$ 17,292.942	$ 46,443.937	37.23 %	$ 29,150.995	NA	40.81 %
2020	4,600.719	1,047.792	3,552.927	1,979.264	284.589	2,846.863	21.207	17,754.044	47,369.162	37.48	29,615.118	NA	43.02
2021	4,667.191	1,098.034	3,569.157	2,110.393	285.889	2,902.924	21.896	18,543.952	48,286.220	38.40	29,742.268	NA	45.22
2022	4,747.502	1,151.369	3,596.133	2,183.033	288.050	3,000.980	22.608	19,217.352	49,152.541	39.10	29,935.188	NA	45.98
2023	4,839.091	1,205.894	3,633.197	2,245.916	291.019	3,099.622	23.343	19,869.670	49,965.465	39.77	30,095.794	NA	46.41
2024	4,934.865	1,260.620	3,674.245	2,323.010	294.307	3,204.411	24.101	20,579.387	50,715.242	40.58	30,135.856	NA	47.07
2025	5,034.169	1,315.869	3,718.300	2,372.824	297.836	3,311.964	24.885	21,280.190	51,395.291	41.40	30,115.101	NA	47.13
2026	5,137.290	1,370.888	3,766.402	2,421.430	301.689	3,419.703	25.693	21,970.346	52,001.680	42.25	30,031.334	NA	47.13
2027	5,246.348	1,426.914	3,819.434	2,472.834	305.937	3,523.203	26.528	22,656.789	52,535.015	43.13	29,878.226	NA	47.13
2028	5,361.093	1,483.613	3,877.480	2,526.918	310.586	3,625.186	27.390	23,343.990	52,993.062	44.05	29,649.073	NA	47.13
2029	5,479.091	1,540.933	3,938.158	2,582.536	315.446	3,728.638	28.281	24,032.256	53,370.088	45.03	29,337.831	NA	47.13
2030	5,599.713	1,598.763	4,000.950	2,639.390	320.476	3,826.810	29.200	24,728.540	53,666.152	46.08	28,937.612	NA	47.13
2031	5,725.291	1,659.129	4,066.161	2,698.580	325.700	3,925.337	30.149	25,435.596	53,875.415	47.21	28,439.819	NA	47.13
2032	5,856.876	1,722.326	4,134.550	2,760.602	331.177	4,012.152	31.129	26,169.409	54,004.419	48.46	27,835.010	NA	47.13
2033	5,995.312	1,787.883	4,207.428	2,825.853	337.015	4,091.747	32.140	26,942.919	54,056.370	49.84	27,113.451	NA	47.13
2034	6,139.477	1,855.619	4,283.858	2,893.805	343.137	4,165.774	33.185	27,767.611	54,033.047	51.39	26,265.437	NA	47.13
2035	6,288.298	1,925.203	4,363.094	2,963.950	349.484	4,165.381	34.263	28,726.293	54,006.915	53.19	25,280.622	NA	47.13
2036	6,440.819	1,996.254	4,444.565	3,035.840	356.010	4,221.956	35.377	29,771.102	53,919.315	55.21	24,148.213	NA	47.13
2037	6,597.671	2,069.257	4,528.414	3,109.771	362.726	4,272.124	36.527	30,916.738	53,773.185	57.49	22,856.447	NA	47.13
2038	6,759.718	2,144.544	4,615.174	3,186.151	369.675	4,316.834	37.714	32,178.380	53,570.963	60.07	21,392.583	NA	47.13
2039	6,927.107	2,221.629	4,705.478	3,265.049	376.909	4,351.124	38.940	33,577.479	53,320.961	62.97	19,743.482	NA	47.13
2040	7,099.509	2,300.875	4,798.634	3,346.310	384.371	4,377.265	40.205	35,134.368	53,029.978	66.25	17,895.610	NA	47.13
2041	7,278.983	2,382.518	4,896.464	3,430.904	392.207	4,392.157	41.512	36,875.110	52,709.190	69.96	15,834.080	NA	47.13
2042	7,463.961	2,466.700	4,997.261	3,518.092	400.281	4,393.358	42.861	38,829.141	52,373.272	74.14	13,544.131	NA	47.13
2043	7,654.002	2,552.632	5,101.370	3,607.666	408.620	4,383.299	44.254	41,025.188	52,034.974	78.84	11,009.786	NA	47.13
2044	7,848.042	2,640.546	5,207.496	3,699.126	417.120	4,365.124	45.692	43,490.039	51,704.267	84.11	8,214.228	NA	47.13
2045	8,045.470	2,730.749	5,314.721	3,792.182	425.709	4,336.655	47.177	46,254.167	51,393.518	90.00	5,139.351	NA	47.13

[1] Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.
[2] Excludes SMP contributions. Includes employer contributions.

Table 18
Hypothetical Assets to Determine Maximum Contribution
Projections – Does Not Reflect Recognition of Deferred Asset Gains and Losses in Projected Actuarial Value of Assets
(Before Impact of Bonds Issued in 2004)
Assumes Investment Return of 6.75% Each Year on Actuarial Value of Assets
($ in Millions)

Fiscal Year Ending	Total Payroll[1]	SMP Payroll	DB Payroll[1]	SURS Contributions[2]	Member Contributions	Benefits	Expenses	Assets EOY	AAL	Funding Ratio	UAAL	Debt Service	SURS Contribution % of Total Payroll
2019	$ 4,356.631	$ 960.360	$ 3,396.271	$ 1,778.019	$ 280.018	$ 2,639.529	$ 16.084	$ 17,292.942	$ 46,443.937	37.23 %	$ 29,150.995	NA	40.81 %
2020	4,600.719	1,047.792	3,552.927	1,979.264	284.589	2,846.863	21.207	17,835.939	47,369.162	37.65	29,533.222	NA	43.02
2021	4,667.191	1,098.034	3,569.157	2,110.393	285.889	2,902.924	21.896	18,493.781	48,286.220	38.30	29,792.439	NA	45.22
2022	4,747.502	1,151.369	3,596.133	2,177.092	288.050	3,000.980	22.608	19,165.125	49,152.541	38.99	29,987.415	NA	45.86
2023	4,839.091	1,205.894	3,633.197	2,250.062	291.019	3,099.622	23.343	19,857.570	49,965.465	39.74	30,107.895	NA	46.50
2024	4,934.865	1,260.620	3,674.245	2,326.672	294.307	3,204.411	24.101	20,570.253	50,715.242	40.56	30,144.990	NA	47.15
2025	5,034.169	1,315.869	3,718.300	2,373.491	297.836	3,311.964	24.885	21,271.128	51,395.291	41.39	30,124.162	NA	47.15
2026	5,137.290	1,370.888	3,766.402	2,422.110	301.689	3,419.703	25.693	21,961.376	52,001.680	42.23	30,040.304	NA	47.15
2027	5,246.348	1,426.914	3,819.434	2,473.529	305.937	3,523.203	26.528	22,647.931	52,535.015	43.11	29,887.084	NA	47.15
2028	5,361.093	1,483.613	3,877.480	2,527.628	310.586	3,625.186	27.390	23,335.268	52,993.062	44.03	29,657.795	NA	47.15
2029	5,479.091	1,540.933	3,938.158	2,583.261	315.446	3,728.638	28.281	24,023.696	53,370.088	45.01	29,346.392	NA	47.15
2030	5,599.713	1,598.763	4,000.950	2,640.132	320.476	3,826.810	29.200	24,720.167	53,666.152	46.06	28,945.984	NA	47.15
2031	5,725.291	1,659.129	4,066.161	2,699.339	325.700	3,925.337	30.149	25,427.442	53,875.415	47.20	28,447.973	NA	47.15
2032	5,856.876	1,722.326	4,134.550	2,761.378	331.177	4,012.152	31.129	26,161.506	54,004.419	48.44	27,842.912	NA	47.15
2033	5,995.312	1,787.883	4,207.428	2,826.647	337.015	4,091.747	32.140	26,935.304	54,056.370	49.83	27,121.066	NA	47.15
2034	6,139.477	1,855.619	4,283.858	2,894.618	343.137	4,165.774	33.185	27,760.322	54,033.047	51.38	26,272.726	NA	47.15
2035	6,288.298	1,925.203	4,363.094	2,964.783	349.484	4,165.381	34.263	28,719.373	54,006.915	53.18	25,287.542	NA	47.15
2036	6,440.819	1,996.254	4,444.565	3,036.693	356.010	4,221.956	35.377	29,764.595	53,919.315	55.20	24,154.719	NA	47.15
2037	6,597.671	2,069.257	4,528.414	3,110.645	362.726	4,272.124	36.527	30,910.696	53,773.185	57.48	22,862.489	NA	47.15
2038	6,759.718	2,144.544	4,615.174	3,187.047	369.675	4,316.834	37.714	32,172.855	53,570.963	60.06	21,398.108	NA	47.15
2039	6,927.107	2,221.629	4,705.478	3,265.967	376.909	4,351.124	38.940	33,572.529	53,320.961	62.96	19,748.431	NA	47.15
2040	7,099.509	2,300.875	4,798.634	3,347.250	384.371	4,377.265	40.205	35,130.056	53,029.978	66.25	17,899.923	NA	47.15
2041	7,278.983	2,382.518	4,896.464	3,431.868	392.207	4,392.157	41.512	36,871.503	52,709.190	69.95	15,837.687	NA	47.15
2042	7,463.961	2,466.700	4,997.261	3,519.080	400.281	4,393.358	42.861	38,826.312	52,373.272	74.13	13,546.960	NA	47.15
2043	7,654.002	2,552.632	5,101.370	3,608.680	408.620	4,383.299	44.254	41,023.215	52,034.974	78.84	11,011.758	NA	47.15
2044	7,848.042	2,640.546	5,207.496	3,700.166	417.120	4,365.124	45.692	43,489.007	51,704.267	84.11	8,215.259	NA	47.15
2045	8,045.470	2,730.749	5,314.721	3,793.248	425.709	4,336.655	47.177	46,254.167	51,393.518	90.00	5,139.351	NA	47.15

[1] Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.
[2] Excludes SMP contributions. Includes employer contributions.

Table 19
Additional Details – Total Normal Cost Dollars
($ in Millions)

Fiscal	Total Normal Cost [1]				Admin Expense				Normal Cost with Admin Expense			
Year		Tier 2				Tier 2				Tier 2		
Ending	Tier 1	Current	Future	Total	Tier 1	Current	Future	Total	Tier 1	Current	Future	Total
2020	$ 592.768	$ 115.358	$ 0.000	$ 708.126	$ 14.508	$ 6.699	$ 0.000	$ 21.207	$ 607.275	$ 122.057	$ 0.000	$ 729.332
2021	563.048	109.054	23.735	695.837	14.056	6.318	1.522	21.896	577.104	115.373	25.257	717.734
2022	535.480	103.717	45.676	684.873	13.598	5.972	3.038	22.608	549.078	109.689	48.714	707.481
2023	508.637	99.580	67.019	675.236	13.088	5.688	4.567	23.343	521.725	105.268	71.586	698.579
2024	482.097	96.498	87.205	665.800	12.566	5.494	6.041	24.101	494.663	101.992	93.246	689.901
2025	455.649	94.096	107.134	656.879	12.024	5.354	7.507	24.885	467.674	99.449	114.641	681.764
2026	429.614	92.283	127.001	648.898	11.466	5.246	8.981	25.693	441.080	97.529	135.982	674.591
2027	404.134	90.893	147.048	642.075	10.888	5.153	10.487	26.528	415.022	96.046	157.535	668.603
2028	379.397	89.823	167.127	636.347	10.304	5.075	12.011	27.390	389.701	94.898	179.138	663.737
2029	355.028	89.002	187.425	631.455	9.713	5.010	13.557	28.281	364.741	94.012	200.982	659.735
2030	330.325	88.341	207.969	626.635	9.108	4.952	15.139	29.200	339.433	93.294	223.108	655.835
2031	305.132	87.852	228.824	621.808	8.481	4.899	16.769	30.149	313.613	92.750	245.594	651.957
2032	279.906	87.489	249.877	617.272	7.845	4.847	18.437	31.129	287.751	92.335	268.314	648.400
2033	255.614	87.149	271.099	613.862	7.221	4.790	20.130	32.140	262.835	91.939	291.228	646.002
2034	232.286	86.869	292.485	611.640	6.609	4.730	21.845	33.185	238.895	91.600	314.331	644.826
2035	209.242	86.677	314.131	610.050	6.001	4.670	23.592	34.263	215.243	91.347	337.723	644.313
2036	186.337	86.515	335.989	608.841	5.397	4.608	25.371	35.377	191.734	91.124	361.360	644.218
2037	163.681	86.335	358.066	608.082	4.801	4.545	27.182	36.527	168.482	90.880	385.248	644.610
2038	141.500	86.159	380.390	608.049	4.215	4.478	29.020	37.714	145.716	90.637	409.410	645.763
2039	120.429	85.983	402.894	609.306	3.655	4.409	30.875	38.940	124.085	90.392	433.769	648.246
2040	100.933	85.710	425.473	612.116	3.132	4.333	32.740	40.205	104.065	90.043	458.214	652.322
2041	83.753	85.283	448.135	617.171	2.660	4.248	34.604	41.512	86.413	89.531	482.739	658.683
2042	69.319	84.640	470.726	624.685	2.251	4.152	36.457	42.861	71.570	88.793	507.183	667.546
2043	57.187	83.757	493.325	634.269	1.897	4.046	38.310	44.254	59.084	87.803	531.635	678.522
2044	47.042	82.542	515.959	645.543	1.593	3.927	40.172	45.692	48.635	86.469	556.130	691.234
2045	38.379	80.916	538.701	657.996	1.325	3.795	42.058	47.177	39.704	84.710	580.758	705.172
2046	30.859	78.872	561.601	671.332	1.085	3.647	43.978	48.710	31.944	82.519	605.579	720.042

[1] *Normal Cost excludes expense portion.*

Values may not add due to rounding.

Table 20
Additional Details – Normal Cost Rates
($ in Millions)

Fiscal Year Ending	Expected Defined Benefit Plan Pay [1]				Total Normal Cost Rate [1]					Employer Normal Cost Rate		
		Tier 2				Tier 2			Combined			
	Tier 1	Current	Future	Total	Tier 1	Current	Future	Total	Tier 2	Tier 1	Tier 2	Total
2020	$ 2,409.201	$ 1,112.536	$ 0.000	$ 3,521.737	25.21%	10.97%		20.71%	10.97%	17.20%	2.96%	12.70%
2021	2,264.628	1,017.998	245.240	3,527.866	25.48%	11.33%	10.30%	20.34%	11.13%	17.47%	3.12%	12.33%
2022	2,131.432	936.078	476.183	3,543.693	25.76%	11.72%	10.23%	19.96%	11.22%	17.75%	3.21%	11.95%
2023	2,004.348	870.992	699.359	3,574.699	26.03%	12.09%	10.24%	19.54%	11.26%	18.02%	3.25%	11.53%
2024	1,881.801	822.647	904.653	3,609.101	26.29%	12.40%	10.31%	19.12%	11.30%	18.28%	3.29%	11.11%
2025	1,762.278	784.641	1,100.153	3,647.072	26.54%	12.67%	10.42%	18.69%	11.36%	18.53%	3.35%	10.68%
2026	1,646.092	753.127	1,289.341	3,688.560	26.80%	12.95%	10.55%	18.29%	11.43%	18.79%	3.42%	10.28%
2027	1,533.687	725.917	1,477.236	3,736.840	27.06%	13.23%	10.66%	17.89%	11.51%	19.05%	3.50%	9.88%
2028	1,425.495	702.145	1,661.690	3,789.330	27.34%	13.52%	10.78%	17.52%	11.59%	19.33%	3.58%	9.51%
2029	1,320.697	681.178	1,843.342	3,845.217	27.62%	13.80%	10.90%	17.16%	11.69%	19.61%	3.68%	9.15%
2030	1,217.503	661.987	2,023.700	3,903.190	27.88%	14.09%	11.02%	16.80%	11.78%	19.87%	3.77%	8.79%
2031	1,115.344	644.208	2,205.308	3,964.860	28.12%	14.40%	11.14%	16.44%	11.87%	20.11%	3.86%	8.43%
2032	1,015.478	627.347	2,386.410	4,029.235	28.34%	14.72%	11.24%	16.09%	11.97%	20.33%	3.96%	8.08%
2033	920.584	610.731	2,566.435	4,097.750	28.55%	15.05%	11.35%	15.76%	12.06%	20.54%	4.05%	7.75%
2034	830.590	594.439	2,745.258	4,170.287	28.76%	15.41%	11.45%	15.46%	12.15%	20.75%	4.14%	7.45%
2035	743.775	578.738	2,923.912	4,246.425	28.94%	15.78%	11.55%	15.17%	12.25%	20.93%	4.24%	7.16%
2036	659.827	563.390	3,101.675	4,324.892	29.06%	16.17%	11.65%	14.90%	12.35%	21.05%	4.34%	6.89%
2037	579.030	548.140	3,278.535	4,405.705	29.10%	16.58%	11.75%	14.63%	12.44%	21.09%	4.43%	6.62%
2038	501.833	533.133	3,454.686	4,489.652	29.04%	17.00%	11.85%	14.38%	12.54%	21.03%	4.53%	6.37%
2039	429.721	518.307	3,629.518	4,577.546	28.88%	17.44%	11.95%	14.16%	12.64%	20.87%	4.63%	6.15%
2040	363.674	503.134	3,801.739	4,668.547	28.61%	17.90%	12.05%	13.97%	12.74%	20.60%	4.73%	5.96%
2041	305.295	487.480	3,971.302	4,764.077	28.30%	18.37%	12.16%	13.83%	12.83%	20.29%	4.82%	5.82%
2042	255.442	471.156	4,136.679	4,863.277	28.02%	18.85%	12.26%	13.73%	12.93%	20.01%	4.92%	5.72%
2043	212.900	454.028	4,298.710	4,965.638	27.75%	19.34%	12.37%	13.66%	13.03%	19.74%	5.02%	5.65%
2044	176.756	435.815	4,457.675	5,070.246	27.52%	19.84%	12.48%	13.63%	13.13%	19.51%	5.12%	5.62%
2045	145.369	416.325	4,614.474	5,176.168	27.31%	20.35%	12.59%	13.62%	13.23%	19.30%	5.22%	5.61%
2046	117.656	395.593	4,769.773	5,283.022	27.15%	20.86%	12.70%	13.63%	13.32%	19.14%	5.31%	5.62%

[1]*Expected pay for members in the defined benefit plans at June 30. Used to develop normal cost as a percent of pay.*

Values may not add due to rounding.

Table 21

Additional Details – Number of Members, Contributions and Payroll

($ in Millions)

Fiscal	SMP Total	Number of Defined Benefit Plan Active				Defined Benefit Plan Payroll [1]				Member Contributions			
Year	Active		Tier 2				Tier 2				Tier 2		
Ending	Members	Tier 1	Current	Future	Total	Tier 1	Current	Future	Total	Tier 1	Current	Future	Total
2019	12,531	37,150	25,439	0	62,589	$ 2,388.939	$ 1,007.332	$ 0.000	$ 3,396.271				$ 280.018
2020	13,801	33,286	21,575	6,458	61,319	2,283.221	1,027.118	242.588	3,552.927	$ 182.886	$ 82.272	$ 19.431	284.589
2021	14,932	29,859	18,286	12,044	60,189	2,151.036	946.184	471.937	3,569.157	172.298	75.789	37.802	285.889
2022	15,925	26,770	15,570	16,855	59,195	2,024.959	875.868	695.306	3,596.133	162.199	70.157	55.694	288.050
2023	16,641	24,191	13,859	20,430	58,480	1,903.901	824.348	904.948	3,633.197	152.503	66.030	72.486	291.019
2024	17,213	21,903	12,621	23,385	57,909	1,785.645	784.529	1,104.071	3,674.245	143.030	62.841	88.436	294.307
2025	17,716	19,806	11,601	25,998	57,405	1,670.221	751.903	1,296.176	3,718.300	133.785	60.227	103.824	297.836
2026	18,164	17,880	10,738	28,340	56,958	1,558.402	724.521	1,483.479	3,766.402	124.828	58.034	118.827	301.689
2027	18,564	16,102	9,993	30,462	56,557	1,450.180	700.269	1,668.985	3,819.434	116.159	56.092	133.686	305.937
2028	18,924	14,473	9,342	32,382	56,197	1,346.503	679.043	1,851.934	3,877.480	107.855	54.391	148.340	310.586
2029	19,245	12,963	8,767	34,145	55,875	1,244.715	659.955	2,033.488	3,938.158	99.702	52.862	162.882	315.446
2030	19,540	11,552	8,248	35,781	55,581	1,144.086	642.114	2,214.750	4,000.950	91.642	51.433	177.401	320.476
2031	19,818	10,228	7,779	37,297	55,304	1,044.123	625.545	2,396.493	4,066.161	83.635	50.106	191.959	325.700
2032	20,078	9,018	7,341	38,685	55,044	948.079	609.411	2,577.060	4,134.550	75.940	48.814	206.423	331.177
2033	20,315	7,925	6,930	39,951	54,806	857.944	593.285	2,756.199	4,207.428	68.721	47.522	220.772	337.015
2034	20,535	6,918	6,550	41,118	54,586	771.434	577.802	2,934.622	4,283.858	61.792	46.282	235.063	343.137
2035	20,738	5,988	6,195	42,200	54,383	687.487	562.715	3,112.892	4,363.094	55.068	45.073	249.343	349.484
2036	20,924	5,135	5,862	43,201	54,198	606.615	547.833	3,290.117	4,444.565	48.591	43.881	263.538	356.010
2037	21,093	4,349	5,547	44,132	54,028	528.857	532.916	3,466.641	4,528.414	42.361	42.687	277.678	362.726
2038	21,252	3,631	5,251	44,987	53,869	455.070	518.504	3,641.600	4,615.174	36.451	41.532	291.692	369.675
2039	21,391	2,998	4,969	45,763	53,730	387.364	503.883	3,814.231	4,705.478	31.028	40.361	305.520	376.909
2040	21,518	2,442	4,698	46,464	53,604	325.489	488.830	3,984.315	4,798.634	26.072	39.155	319.144	384.371
2041	21,625	1,986	4,434	47,075	53,495	272.965	473.204	4,150.295	4,896.464	21.864	37.904	332.439	392.207
2042	21,718	1,612	4,176	47,614	53,402	227.781	456.767	4,312.713	4,997.261	18.246	36.587	345.448	400.281
2043	21,799	1,306	3,924	48,092	53,322	189.605	439.542	4,472.223	5,101.370	15.188	35.207	358.225	408.620
2044	21,870	1,052	3,672	48,526	53,250	156.930	420.920	4,629.646	5,207.496	12.569	33.716	370.835	417.120
2045	21,935	838	3,421	48,928	53,187	128.040	401.172	4,785.509	5,314.721	10.256	32.134	383.319	425.709

[1] Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in the Tier 2 participating in the Traditional and Portable plans.

Values may not add due to rounding.

Table 22
Additional Details – Present Value of Future Benefits and Benefit Payments
($ in Millions)

Fiscal	Present Value of Future Benefits						Benefit Payments					
Year	Current	Current	Tier 1	Tier 2 Actives			Current	Current	Tier 1	Tier 2 Actives		
Ending	Retirees	Inactives	Actives	Current	Future	Total	Retirees	Inactives	Actives	Current	Future	Total
2019	$ 31,856.494	$ 2,990.194	$ 15,670.257	$ 1,763.214	$ 0.000	$ 52,280.159						$ 2,639.529
2020	31,313.272	3,121.999	16,603.947	1,828.476	206.615	53,074.309	2,606.986	67.782	120.067	52.028	0.000	2,846.863
2021	30,743.799	3,245.436	17,552.089	1,897.911	432.830	53,872.065	2,596.905	84.493	167.077	52.252	2.197	2,902.924
2022	30,121.623	3,366.067	18,490.000	1,976.137	683.801	54,637.628	2,610.711	95.272	238.923	48.280	7.794	3,000.980
2023	29,447.853	3,482.614	19,412.194	2,065.157	953.400	55,361.218	2,619.998	107.107	315.409	42.944	14.164	3,099.622
2024	28,724.019	3,593.700	20,310.321	2,165.326	1,242.237	56,035.603	2,624.435	120.006	398.952	37.969	23.049	3,204.411
2025	27,951.622	3,696.420	21,177.214	2,278.062	1,551.082	56,654.400	2,624.150	135.361	487.857	32.349	32.247	3,311.964
2026	27,132.604	3,788.619	22,010.122	2,403.318	1,879.213	57,213.876	2,618.810	152.254	577.386	27.597	43.656	3,419.703
2027	26,269.349	3,871.390	22,802.793	2,541.464	2,227.718	57,712.714	2,608.120	167.403	670.744	23.304	53.632	3,523.203
2028	25,364.410	3,942.245	23,552.930	2,692.537	2,596.148	58,148.270	2,592.066	184.344	763.697	19.818	65.261	3,625.186
2029	24,420.855	3,999.344	24,255.009	2,853.848	2,986.084	58,515.140	2,570.319	202.287	859.219	19.779	77.034	3,728.638
2030	23,442.049	4,041.818	24,901.699	3,021.788	3,407.544	58,814.898	2,542.796	220.172	958.695	23.901	81.246	3,826.810
2031	22,431.926	4,067.697	25,483.923	3,196.402	3,861.751	59,041.699	2,509.160	239.009	1,063.340	28.413	85.415	3,925.337
2032	21,394.854	4,077.840	26,002.386	3,377.650	4,348.919	59,201.649	2,469.251	255.931	1,163.088	33.401	90.481	4,012.152
2033	20,335.643	4,072.141	26,453.824	3,565.386	4,869.996	59,296.990	2,422.925	271.925	1,261.832	38.961	96.104	4,091.747
2034	19,259.512	4,048.378	26,834.905	3,759.546	5,426.843	59,329.184	2,370.102	289.037	1,359.420	45.009	102.206	4,165.774
2035	18,171.896	4,076.216	27,141.231	3,959.991	6,021.458	59,370.792	2,310.913	237.542	1,456.671	51.612	108.643	4,165.381
2036	17,078.497	4,093.726	27,369.421	4,166.584	6,655.180	59,363.408	2,245.456	249.355	1,552.308	58.755	116.082	4,221.956
2037	15,985.225	4,100.325	27,516.069	4,378.931	7,329.692	59,310.242	2,173.900	261.061	1,646.138	66.683	124.342	4,272.124
2038	14,898.259	4,095.105	27,577.112	4,596.540	8,046.019	59,213.035	2,096.370	272.930	1,738.574	75.464	133.496	4,316.834
2039	13,823.668	4,078.274	27,552.546	4,818.980	8,805.113	59,078.581	2,013.382	283.828	1,825.419	85.004	143.491	4,351.124
2040	12,767.508	4,049.233	27,441.632	5,045.755	9,608.345	58,912.473	1,925.339	294.545	1,907.388	95.341	154.652	4,377.265
2041	11,735.691	4,008.319	27,246.697	5,276.021	10,456.018	58,722.746	1,832.777	304.141	1,981.462	106.777	167.000	4,392.157
2042	10,733.838	3,956.157	26,973.666	5,508.528	11,349.984	58,522.173	1,736.366	312.354	2,044.315	119.653	180.670	4,393.358
2043	9,767.163	3,893.673	26,626.852	5,742.030	12,291.981	58,321.699	1,636.868	318.936	2,097.889	133.878	195.728	4,383.299
2044	8,840.475	3,820.900	26,209.859	5,974.947	13,284.243	58,130.424	1,535.010	324.813	2,143.155	149.701	212.445	4,365.124
2045	7,957.989	3,738.461	25,729.705	6,205.106	14,328.864	57,960.125	1,431.687	329.413	2,177.043	167.586	230.926	4,336.655

Values may not add due to rounding.

Table 23
Additional Details – Actuarial Accrued Liability and Employer Normal Cost Dollars
($ in Millions)

Fiscal	Actuarial Accrued Liability						Fiscal	Employer Normal Cost Dollar		
Year	Current	Current	Tier 1	Tier 2 Actives			Year			
Ending	Retirees	Inactives	Actives	Current	Future	Total	Ending	Tier 1	Tier 2	Total
2019	$ 31,856.494	$ 2,990.194	$ 11,104.370	$ 492.879	$ 0.000	$ 46,443.937	2020	$ 424.389	$ 20.354	$ 444.743
2020	31,313.272	3,121.999	12,342.310	591.581	0.000	47,369.162	2021	404.806	27.039	431.845
2021	30,743.799	3,245.436	13,584.531	690.201	22.253	48,286.220	2022	386.879	32.552	419.431
2022	30,121.623	3,366.067	14,807.891	794.066	62.894	49,152.541	2023	369.222	38.338	407.560
2023	29,447.853	3,482.614	16,007.065	906.183	121.750	49,965.465	2024	351.633	43.961	395.594
2024	28,724.019	3,593.700	17,173.447	1,027.822	196.254	50,715.242	2025	333.889	50.039	383.928
2025	27,951.622	3,696.420	18,299.378	1,160.996	286.875	51,395.291	2026	316.252	56.650	372.902
2026	27,132.604	3,788.619	19,381.909	1,306.197	392.351	52,001.680	2027	298.863	63.803	362.666
2027	26,269.349	3,871.390	20,414.726	1,464.198	515.352	52,535.015	2028	281.846	71.305	353.151
2028	25,364.410	3,942.245	21,395.660	1,635.360	655.387	52,993.062	2029	265.039	79.250	344.289
2029	24,420.855	3,999.344	22,318.939	1,817.268	813.682	53,370.088	2030	247.791	87.568	335.359
2030	23,442.049	4,041.818	23,176.237	2,006.513	999.535	53,666.152	2031	229.978	96.279	326.257
2031	22,431.926	4,067.697	23,957.254	2,203.364	1,215.174	53,875.415	2032	211.811	105.412	317.223
2032	21,394.854	4,077.840	24,661.863	2,407.975	1,461.887	54,004.419	2033	194.114	114.873	308.987
2033	20,335.643	4,072.141	25,286.917	2,620.301	1,741.368	54,056.370	2034	177.103	124.586	301.689
2034	19,259.512	4,048.378	25,829.229	2,840.421	2,055.507	54,033.047	2035	160.175	134.654	294.829
2035	18,171.896	4,076.216	26,283.860	3,068.379	2,406.564	54,006.915	2036	143.143	145.065	288.208
2036	17,078.497	4,093.726	26,646.702	3,304.176	2,796.214	53,919.315	2037	126.121	155.763	281.884
2037	15,985.225	4,100.325	26,913.681	3,547.512	3,226.442	53,773.185	2038	109.265	166.823	276.088
2038	14,898.259	4,095.105	27,080.262	3,798.019	3,699.318	53,570.963	2039	93.057	178.280	271.337
2039	13,823.668	4,078.274	27,146.585	4,055.398	4,217.036	53,320.961	2040	77.993	189.958	267.951
2040	12,767.508	4,049.233	27,112.552	4,319.186	4,781.499	53,029.978	2041	64.549	201.927	266.476
2041	11,735.691	4,008.319	26,981.939	4,588.523	5,394.718	52,709.190	2042	53.324	213.941	267.265
2042	10,733.838	3,956.157	26,762.656	4,862.074	6,058.547	52,373.272	2043	43.896	226.006	269.902
2043	9,767.163	3,893.673	26,460.685	5,138.478	6,774.975	52,034.974	2044	36.066	238.048	274.114
2044	8,840.475	3,820.900	26,081.078	5,415.937	7,545.877	51,704.267	2045	29.448	250.015	279.463
2045	7,957.989	3,738.461	25,631.887	5,691.965	8,373.216	51,393.518	2046	23.731	261.934	285.665

Values may not add due to rounding.

Table 24
Additional Details – Payroll and Payroll in Excess of Governor's Pay
($ in Millions)

Fiscal Year Ending	Defined Benefit Plan Payroll [1]				Defined Benefit Plan Payroll in Excess of Governor's Pay [2]		
		Tier 2				Tier 2	
	Tier 1	Current	Future	Total	Tier 1	Current	Total
2019	$ 2,388.939	$ 1,007.332	$ 0.000	$ 3,396.271	$ 60.295	$ 0.000	$ 60.295
2020	2,283.221	1,027.118	242.588	3,552.927	69.559	0.000	69.559
2021	2,151.036	946.184	471.937	3,569.157	66.039	0.000	66.039
2022	2,024.959	875.868	695.306	3,596.133	64.498	0.000	64.498
2023	1,903.901	824.348	904.948	3,633.197	62.601	0.000	62.601
2024	1,785.645	784.529	1,104.071	3,674.245	60.690	0.000	60.690
2025	1,670.221	751.903	1,296.176	3,718.300	58.668	0.000	58.668
2026	1,558.402	724.521	1,483.479	3,766.402	56.524	0.000	56.524
2027	1,450.180	700.269	1,668.985	3,819.434	54.548	0.000	54.548
2028	1,346.503	679.043	1,851.934	3,877.480	52.606	0.000	52.606
2029	1,244.715	659.955	2,033.488	3,938.158	50.591	0.000	50.591
2030	1,144.086	642.114	2,214.750	4,000.950	48.504	0.000	48.504
2031	1,044.123	625.545	2,396.493	4,066.161	45.955	0.000	45.955
2032	948.079	609.411	2,577.060	4,134.550	43.574	0.000	43.574
2033	857.944	593.285	2,756.199	4,207.428	41.172	0.000	41.172
2034	771.434	577.802	2,934.622	4,283.858	38.808	0.000	38.808
2035	687.487	562.715	3,112.892	4,363.094	36.412	0.000	36.412
2036	606.615	547.833	3,290.117	4,444.565	33.871	0.000	33.871
2037	528.857	532.916	3,466.641	4,528.414	31.292	0.000	31.292
2038	455.070	518.504	3,641.600	4,615.174	28.638	0.000	28.638
2039	387.364	503.883	3,814.231	4,705.478	26.041	0.000	26.041
2040	325.489	488.830	3,984.315	4,798.634	23.369	0.000	23.369
2041	272.965	473.204	4,150.295	4,896.464	20.845	0.000	20.845
2042	227.781	456.767	4,312.713	4,997.261	18.247	0.000	18.247
2043	189.605	439.542	4,472.223	5,101.370	15.957	0.000	15.957
2044	156.930	420.920	4,629.646	5,207.496	13.791	0.000	13.791
2045	128.040	401.172	4,785.509	5,314.721	11.733	0.000	11.733

[1] Payroll shown is pensionable pay. It does not include amounts in excess of the pay caps applicable to members in Tier 2 participating in the Traditional and Portable plans.

[2] Governor's pay is $177,500 in 2019 and is projected to increase annually by 1.125 percent.

Values may not add due to rounding.

Table 25
Additional Details – Statutorily Required Employer Contributions
($ in Millions)

Fiscal Year Ending	Applicable Employer Normal Cost Rates		Employer Normal Cost Contributions for Pay in Excess of the Governor's Pay [1]			Total Employer Contributions Required by Statute [2]		
	Tier 1	Total	Tier 1	Tier 2	Total	Tier 1	Tier 2	Total
2021	17.20%	12.70%			$ 5.529	$ 0.000	$ 0.000	$ 5.529
2022	17.47%	12.33%	$ 8.508	$ 0.000	8.508	8.508	0.000	8.508
2023	17.75%	11.95%	8.206	0.000	8.206	8.206	0.000	8.206
2024	18.02%	11.53%	8.136	0.000	8.136	8.136	0.000	8.136
2025	18.28%	11.11%	8.009	0.000	8.009	8.009	0.000	8.009
2026	18.53%	10.68%	7.871	0.000	7.871	7.871	0.000	7.871
2027	18.79%	10.28%	7.715	0.000	7.715	7.715	0.000	7.715
2028	19.05%	9.88%	7.538	0.000	7.538	7.538	0.000	7.538
2029	19.33%	9.51%	7.380	0.000	7.380	7.380	0.000	7.380
2030	19.61%	9.15%	7.220	0.000	7.220	7.220	0.000	7.220
2031	19.87%	8.79%	7.036	0.000	7.036	7.036	0.000	7.036
2032	20.11%	8.43%	6.827	0.000	6.827	6.827	0.000	6.827
2033	20.33%	8.08%	6.539	0.000	6.539	6.539	0.000	6.539
2034	20.54%	7.75%	6.265	0.000	6.265	6.265	0.000	6.265
2035	20.75%	7.45%	5.981	0.000	5.981	5.981	0.000	5.981
2036	20.93%	7.16%	5.686	0.000	5.686	5.686	0.000	5.686
2037	21.05%	6.89%	5.365	0.000	5.365	5.365	0.000	5.365
2038	21.09%	6.62%	5.000	0.000	5.000	5.000	0.000	5.000
2039	21.03%	6.37%	4.606	0.000	4.606	4.606	0.000	4.606
2040	20.87%	6.15%	4.183	0.000	4.183	4.183	0.000	4.183
2041	20.60%	5.96%	3.756	0.000	3.756	3.756	0.000	3.756
2042	20.29%	5.82%	3.320	0.000	3.320	3.320	0.000	3.320
2043	20.01%	5.72%	2.920	0.000	2.920	2.920	0.000	2.920
2044	19.74%	5.65%	2.522	0.000	2.522	2.522	0.000	2.522
2045	19.51%	5.62%	2.179	0.000	2.179	2.179	0.000	2.179
2046	19.30%	5.61%	1.863	0.000	1.863	1.863	0.000	1.863
2047	19.14%	5.62%	1.572	0.000	1.572	1.572	0.000	1.572

[1] FY 2021 amount based on excess pay amount as provided by SURS and the total employer normal cost rate. Amounts in FY 2022 and thereafter based on excess pay amount projected by GRS and the employer normal cost rate by tier. SURS may want to consider having employer normal cost contributions be based on the normal cost rate by tier. 30% of future Tier 1 excess pay employer contributions that would have been calculated are not included because they are already assumed to be part of the federal and trust funds contributions.

[2] Projected employer contributions do not include 6% employer billing contributions. No additional assumption is made for earnings greater than 6% during the final average salary (FAS) period. The participant's employer is required to make contributions equal to the present value of the increase in benefits attributable to member pay increases in excess of 6% during the FAS period. These contributions are collected when the participant retires.

Values may not add due to rounding.

Appendix F

Historical Schedules

Table 26
Historical Schedule of Funding Status
($ in Thousands)

As of June 30	Actuarial Value of Assets	AAL	UAAL	Funded Ratio	Payroll/DB*	UAAL as % of Payroll
2004	$ 12,586,305	$ 19,078,583	$6,492,278	65.97 %	$2,814,071	230.71 %
2005	13,350,278	20,349,922	6,999,644	65.60	2,939,185	238.15
2006	14,175,147	21,688,935	7,513,788	65.36	3,054,100	246.02
2007	15,985,730	23,362,079	7,376,349	68.43	3,180,985	231.89
2008	14,586,325	24,917,678	10,331,353	58.54	3,303,220	312.77
2009	11,032,973	26,316,231	15,283,258	41.92	3,463,922	441.21
2009 **	14,281,998	26,316,231	12,034,233	54.27	3,463,922	347.42
2010 ***	13,966,643	30,120,427	16,153,784	46.37	3,491,071	462.72
2011	13,945,680	31,514,336	17,568,656	44.25	3,460,838	507.64
2012	13,949,905	33,170,216	19,220,311	42.06	3,477,166	552.76
2013	14,262,621	34,373,104	20,110,483	41.49	3,533,858	569.08
2014 ***	15,844,714	37,429,515	21,584,801	42.33	3,522,246	612.81
2015	17,104,607	39,520,687	22,416,080	43.28	3,606,537	621.54
2016	17,701,646	40,923,301	23,221,655	43.26	3,513,108	661.00
2017	18,594,326	41,853,348	23,259,022	44.43	3,458,320	672.55
2018 ***	19,347,886	45,258,751	25,910,865	42.75	3,470,226	746.66
2019	19,650,070	46,443,937	26,793,867	42.31	3,506,650	764.09

AAL – Actuarial Accrued Liability.
UAAL – Unfunded Actuarial Accrued Liability.
** Payroll is rolled forward with salary scale for one year and uses capped payroll for members hired on and after January 1, 2011.*
*** Assets at Actuarial Value (Market Value through first 2009, then Actuarial Value).*
**** Investment rate of return assumption decreased from 8.50 percent to 7.75 percent in plan year 2010, decreased from 7.75 percent to 7.25 percent in plan year 2014, and decreased from 7.25 percent to 6.75 percent in plan year 2018.*

Table 27
Historical Comparison of ARC and State Contributions
($ in Millions)

Fiscal Year	(1) Total Normal Cost	(2) Amortization of UAAL	(3) (1) + (2) Total ADC	(4) Member Contribution	(5) (3) - (4) Net State ARC*	(6) Actual State Contribution	(7) (6) / (5) State Cont. as Percent of Net ARC
2003			$ 843.8	$ 246.3	$ 597.5	$ 285.3	47.74 %
2004			934.8	243.8	691.0	1,757.5	254.36
2005			859.7	251.9	607.8	285.4	46.96
2006			914.9	252.9	662.0	180.0	27.19
2007			968.3	262.4	705.9	261.1	36.99
2008			971.6	264.1	707.5	344.9	48.75
2009			1,147.3	273.3	874.0	451.6	51.67
2010 **			1,278.3	275.0	1,003.3	696.6	69.43
2011 ***	$ 723.798	$ 795.427	1,519.2	260.2	1,259.0	773.6	61.44
2012	700.972	1,000.612	1,701.584	258.236	1,443.348	985.815	68.30
2013	699.747	1,094.681	1,794.428	245.141	1,549.287	1,401.481	90.46
2014	698.225	1,145.380	1,843.605	283.081	1,560.524	1,502.864	96.31

* *ARC - Annual Required Contribution as defined in GASB Statements No. 25 and 27. The ARC is the Actuarially Determined Contribution ("ADC") net of member contributions.*

** *Assets at Actuarial Value (Market Value through 2009, then Actuarial Value beginning with Fiscal Year 2010).*

*** *Investment rate of return assumption decreased from 8.50 percent to 7.75 percent in Fiscal Year 2011.*

Beginning in Fiscal Year 2011, dollars are shown rounded to three decimal places.

Information beginning with Fiscal Year 2015 can be found in Table 11 of the report.

Table 28
Historical Schedule of Contributions
($ in Thousands)

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2010	$ 1,003,331	$ 696,600	$ 306,731	$ 3,491,071	19.95 %
2011	1,259,048	773,595	485,453	3,460,838	22.35
2012	1,443,348	985,815	457,533	3,477,166	28.35
2013	1,549,287	1,401,481	147,806	3,533,858	39.66
2014	1,560,524	1,502,864	57,660	3,522,246	42.67
2015	1,622,656	1,528,525	94,130	3,606,537	42.38
2016	1,811,060	1,582,295	228,765	3,513,108	45.04
2017	1,864,843	1,650,551	214,292	3,458,320	47.73
2018	1,862,033	1,607,880	254,153	3,470,226	46.33
2019	2,239,366	1,642,244	597,122	3,506,650	46.83

For Fiscal Years 2015 and prior, the Actuarially Determined Contribution is equal to normal cost plus 30-year open period amortization of the unfunded actuarial accrued liability as a level percentage of total payroll.

For Fiscal Years 2016 and after, the Actuarially Determined Contribution is equal to net normal cost plus 29-year closed period amortization of the unfunded actuarial accrued liability (from June 30, 2016) as a level percentage of defined benefit plan pensionable (capped) payroll.

Covered employee payroll is equal to defined benefit payroll from the actuarial valuation as of the same date and rolled forward with one year of wage inflation.

APPENDIX G

ACTUARIAL METHODS AND ASSUMPTIONS

Projected Unit Credit Method

The Projected Unit Credit Method is mandated under Section 15-155 of the SURS Article of the Illinois Pension Code as the funding method to be used for SURS.

The concept of this method is that funding of benefits should occur as benefits are accrued (earned) by active members of SURS.

The Normal Cost ("NC") for a fiscal year under this method is the actuarial present value of all benefits expected to be accrued during the fiscal year adjusted for future expected salary increases. The Actuarial Accrued Liability ("AAL") under this method is the actuarial present value of all benefits accrued to the valuation date. To the extent that the assets of the fund are insufficient to cover the AAL, an Unfunded Actuarial Accrued Liability ("UAAL") develops. Under the classical application of this method, the contribution for a year is the NC for that year plus an amount to amortize the UAAL.

Funding Policy to Calculate Statutory Contributions

Under Section 15-155 of the Illinois Pension Code, the employer/State contribution is determined such that the assets of SURS reach 90% of the AAL by the end of FY 2045.

This contribution is determined as a level percentage of pay for all years except that the contribution rates through 2010 shall grade in equal steps to the desired level contribution rate. *We have assumed the contribution would be based on pensionable (capped) payroll for members hired on or after January 1, 2011 ("Tier 2 members").* Pensionable pay does not include amounts in excess of the pay cap ($114,952 in 2019 for Tier 2, increased by the lesser of 3% and 1/2 of the increase in CPI-U as measured in the preceding 12-month calendar year) that is applicable to members hired on or after January 1, 2011, participating in the defined benefit plans.

Public Act 100-0023 (Effective July 6, 2017) made the following changes to the SURS funding policy:

State Contributions

- Requires the State to make additional contributions to SURS in FY 2018, FY 2019 and FY 2020 equal to 2 percent of the total payroll of each employee who participates in the Optional Hybrid Plan or who participates in the Tier 2 plan in lieu of the Optional Hybrid Plan.
- Requires any change in an actuarial assumption that increases or decreases the required State contribution to be implemented in equal annual amounts over a five-year period beginning in the State fiscal year in which the change first applies to the required State contribution.
    - For changes that first applied in FY 2014, FY 2015, FY 2016 or FY 2017, the impact is calculated based on a five-year period and the applicable portion is recognized during the remaining fiscal years in that five-year period.

Employer Contributions

- Requires employers to contribute the employer normal cost of the portion of an employee's earnings that exceeds the amount of salary set for the governor, for academic years beginning on or after July 1, 2017. (Applicable to Tier 1 and Tier 2 employees.)

Public Act 100-0587 (Effective June 4, 2018) made the following changes to the SURS funding policy:

Employer Contributions

- For academic years beginning on or after July 1, 2018, and for earnings paid under a contract or collective bargaining agreement entered into, amended or renewed on or after the effective date of the amendatory Act (June 5, 2018), if a participant's earnings for any academic year with the same employer as the previous academic year used to determine the final average salary increased by more than 3.00%, then the participant's employer shall pay the System the present value of the increase in benefits resulting from the portion of the increase in earnings that is in excess of 3.00%. Prior to the effective date of Public Act 100-0587, the payment from employers was for pay increases in excess of 6.00%.

PA 101-0010 rescinded the change to 3% from PA 100-0587. Therefore, employers make contributions equal to the present value of the increase in benefit attributable to members who receive pay increases in excess of 6% during the final average salary (FAS) period.

The 3% employer billing rule is assumed to apply to all current and future Tier 1 and Tier 2 members.

Statutory Contributions Related to the Optional Hybrid Plan

SURS is currently not moving forward with the implementation of the Optional Hybrid Plan (OHP) created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so. Therefore, contributions related to the OHP are not included in the actuarial valuation, including contributions for employer normal cost, additional 2 percent of payroll contributions and unfunded liability contributions.

Phase In of the Financial Impact of Assumption Changes

On the following page 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, 2014 actuarial valuation the assumed rate of investment return was reduced to 7.25%.
2. Beginning with the June 30, 2015 actuarial valuation there were changes to the demographic assumptions.
3. Beginning with the June 30, 2018 actuarial valuation there were changes to the economic and demographic actuarial assumptions.

Valuation Year Ending 6/30	2018	2019	2020	2021	2022	2023
Applicable Fiscal Year Ending 6/30	2020	2021	2022	2023	2024	2025
	$ in Millions					
	After Impact of Bonds					
Contribution Before Assumption Change:						
(1) Contribution Dollar	$ 1,865.3	$ 2,036.7				
(2) Contribution Rate	40.66%	43.64%				
Contribution After Assumption Change:						
(3) Contribution Dollar	2,003.3	2,036.7				
(4) Contribution Rate	44.02%	43.64%				
(5) Assumption Impact as Percentage of Payroll						
=(4)-(2)	3.36%	0.00%				
(6) Assumption Change Impact Recognized						
This Year (5 year recognition)						
(6a) From This Year	0.67%	0.00%				
(6b) From One Year Ago	0.00%	0.67%	0.00%			
(6c) From Two Years Ago	0.00%	0.00%	0.67%	0.00%		
(6d) From Three Years Ago	0.25%	0.00%	0.00%	0.67%	0.00%	
(6e) From Four Years Ago	0.38%	0.25%	0.00%	0.00%	0.68%	0.00%
(6f) Total Recognized Assumption Change Impact	1.30%	0.92%	0.67%	0.67%	0.68%	0.00%

Contribution Related to Pay in Excess of Governor's Pay

Following is a table with the estimated contributions required under Public Act 100-0023 to be made by employers for pay in excess of the Governor's pay. (Information calculated and provided by SURS.)

		$ in Millions				
		Pay for Preceding Fiscal Year for Affected Members				
Year	Governor's Pay	Excess Pay	Employer Normal Cost Rate	Excess Pay * ER NC Rate	Additional Adjustments[1]	Estimated Employer Contributions
July 1, 2017 - June 30, 2018	$ 177,500	$ 46.831	12.46%	$ 5.835	$ (1.579)	$ 4.256
July 1, 2018 - June 30, 2019	177,500	47.193	12.29%	5.800	(1.654)	4.146
July 1, 2019 - June 30, 2020	177,500	55.726	13.02%	7.256	(2.132)	5.124
July 1, 2020 - June 30, 2021	177,500	60.295	12.70%	7.657	(2.128)	5.529

[1] *Additional adjustments for members with pay in excess of the Governor's pay whose employers' already make normal cost contributions.*

Asset Valuation Method

Prior to the actuarial valuation as of June 30, 2009, market value of assets was used. Under Section 15-155(l) of the Illinois Pension Code, beginning with the actuarial valuation as of June 30, 2009, the asset value is the actuarial value of assets which is calculated by recognizing 20% of the investment gain or loss (the difference between the actual investment return and the expected investment return) on the market value of assets for each of the five following fiscal years. This method was not applied retroactively to recognize a portion of investment gains or losses from previous fiscal years.

Following is a table with the investment return assumption used in recent actuarial valuations.

Valuation Date	Investment Return Assumption
Prior to June 30, 2010	8.50%
June 30, 2010 through June 30, 2013	7.75%
June 30, 2014 through June 30, 2017	7.25%
June 30, 2018 and after	6.75%

Actuarial Assumptions
(Most Adopted Effective with the June 30, 2018, Actuarial Valuation)

Under Section 15-155(a) of the Illinois Pension Code, the Board adopts the assumptions after consultation with the actuary. All actuarial assumptions are expectations of future experience and are not market measures. The rationale for the actuarial assumptions may be found in the experience study report covering the period June 30, 2014 through June 30, 2017, issued to the Board of Trustees on February 26, 2018.

Rate of Investment Return. For all purposes under the system the rate of investment return is assumed to be 6.75% per annum beginning with the **June 30, 2018** actuarial valuation. This assumption is net of investment expenses.

Price Inflation (Increase in Consumer Price Index "CPI"). The assumed rate is 2.25% per annum.

Effective Rate of Interest. The actuarial valuation assumed rate credited to member accounts is 6.75% per annum, beginning with the June 30, 2018 actuarial valuation.

Cost of Living Adjustment "Automatic Annual Increase (AAI)***."*** The assumed rate is 3.00% per annum based on the benefit provision of 3.00% annual compound increases for members hired before January 1, 2011, who have not elected the AAI buyout and 1.50% simple (non-compound) increases for members who have elected the buyout. The assumed rate is 1.125% for members hired on or after January 1, 2011, based on the benefit provision of increases equal to ½ of the increase in CPI-U with a maximum increase of 3.00%.

Annual Compensation Increases. Each member's compensation is assumed to increase by 3.25% each year, 2.25% reflecting salary inflation and 1.00% reflecting standard of living increases. That rate is increased for members with less than 34 years of service to reflect merit, longevity and promotion increases. The rates are based on service at the beginning of the year and are as follows:

Service Year	Total Increase
0	12.25%
1	12.25%
2	8.75%
3	7.00%
4	6.25%
5	5.50%
6	5.50%
7	5.50%
8	4.75%
9	4.50%
10	4.50%
11-14	4.00%
15-18	3.75%
19-33	3.50%
34+	3.25%

Payroll Growth. The assumed rate of total payroll growth is 3.25%.

Mortality. The mortality assumptions are as follows:

Applicable Group	Base Mortality Table	Male Scaling Factor	Female Scaling Factor
Pre-retirement	RP-2014 White Collar Employee, sex distinct	93%	100%
Post-retirement (non-disabled)	RP-2014 White Collar Healthy Annuitant, sex distinct	96%	93%
Post-retirement (disabled)	RP-2014 Disabled Annuitant, sex distinct	112%	123%

Future mortality improvements are reflected by projecting the base mortality tables back from the year 2014 to the year 2006 using the Society of Actuaries (SOA) MP-2014 scale (referred to as the RP-2006 base mortality tables) and projecting from 2006 using the SOA MP-2017 projection scale. The assumptions are generational mortality tables and include a margin for improvement.

	Future Life Expectancy (years) in 2019				Future Life Expectancy (years) in 2030			
	Post-retirement		Disabled - Retiree		Post-retirement		Disabled - Retiree	
Age	Male	Female	Male	Female	Male	Female	Male	Female
35	52.27	54.43	32.77	38.27	53.34	55.44	34.52	39.88
40	47.07	49.23	29.18	33.96	48.12	50.23	30.74	35.45
45	41.96	44.10	25.99	30.02	42.97	45.08	27.41	31.40
50	36.92	39.01	22.92	26.21	37.91	39.97	24.26	27.51
55	31.99	33.96	19.93	22.62	32.96	34.91	21.19	23.83
60	27.20	29.05	17.05	19.33	28.12	29.95	18.16	20.40
65	22.58	24.34	14.34	16.17	23.43	25.18	15.27	17.07
70	18.19	19.84	11.75	13.02	18.96	20.61	12.51	13.81
75	14.11	15.58	9.26	10.08	14.80	16.30	9.91	10.79

Disability. A table of disability incidence with rates follows:

Age	Male	Female	Age	Male	Female
20	0.0247%	0.0328%	50	0.1214%	0.1360%
21	0.0253%	0.0347%	51	0.1287%	0.1401%
22	0.0259%	0.0366%	52	0.1361%	0.1442%
23	0.0265%	0.0385%	53	0.1435%	0.1483%
24	0.0271%	0.0404%	54	0.1508%	0.1524%
25	0.0277%	0.0423%	55	0.1552%	0.1565%
26	0.0283%	0.0442%	56	0.1552%	0.1565%
27	0.0289%	0.0461%	57	0.1552%	0.1565%
28	0.0295%	0.0481%	58	0.1552%	0.1565%
29	0.0300%	0.0500%	59	0.1552%	0.1565%
30	0.0315%	0.0541%	60	0.1552%	0.1565%
31	0.0330%	0.0582%	61	0.1552%	0.1565%
32	0.0345%	0.0623%	62	0.1552%	0.1565%
33	0.0359%	0.0664%	63	0.1552%	0.1565%
34	0.0374%	0.0705%	64	0.1552%	0.1565%
35	0.0395%	0.0745%	65	0.1552%	0.1565%
36	0.0415%	0.0786%	66	0.1552%	0.1565%
37	0.0436%	0.0827%	67	0.1552%	0.1565%
38	0.0457%	0.0868%	68	0.1552%	0.1565%
39	0.0477%	0.0909%	69	0.1552%	0.1565%
40	0.0536%	0.0950%	70	0.1552%	0.1565%
41	0.0595%	0.0991%	71	0.1552%	0.1565%
42	0.0654%	0.1032%	72	0.1552%	0.1565%
43	0.0713%	0.1073%	73	0.1552%	0.1565%
44	0.0772%	0.1114%	74	0.1552%	0.1565%
45	0.0845%	0.1155%	75	0.1552%	0.1565%
46	0.0919%	0.1196%	76	0.1552%	0.1565%
47	0.0993%	0.1237%	77	0.1552%	0.1565%
48	0.1066%	0.1278%	78	0.1552%	0.1565%
49	0.1140%	0.1319%	79	0.1552%	0.1565%

Disability rates apply during the retirement eligibility period.

Members are assumed to first receive disability benefits (DB) and then receive disability retirement annuity (DRA) benefits.

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

Age	Members Hired Before January 1, 2011, and Eligible for: Normal Retirement	Early Retirement	Members Hired on or after January 1, 2011, and Eligible for: Normal Retirement	Early Retirement
Under 50	50.0%	-	-	-
50	50.0	-	-	-
51	40.0	-	-	-
52	40.0	-	-	-
53	35.0	-	-	-
54	35.0	-	-	-
55	35.0	7.0%	-	-
56	30.0	5.5	-	-
57	25.0	4.0	-	-
58	25.0	5.0	-	-
59	25.0	5.5	-	-
60	11.0	-	-	-
61	11.0	-	-	-
62	12.0	-	-	25.0%
63	12.0	-	-	10.0
64	12.0	-	-	10.0
65	15.0	-	-	10.0
66	15.0	-	-	10.0
67	15.0	-	35.0%	-
68	15.0	-	15.0	-
69	15.0	-	15.0	-
70-79	15.0	-	15.0	-
80+	100.0	-	100.0	-

A rate of 50 percent is used if a member has 40 or more years of service and is less than 80 years old. The rates shown above are for members with less than 40 years of service.

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

For purposes of the projections in the actuarial valuation, members of the Self Managed Plan are assumed to retire in accordance with the Tier 1 and Tier 2 retirement rates (based on hire date).

General Turnover. A table of termination rates based on the most recent experience study period. The assumption is a table of turnover rates by years of service. A sample of these rates follows:

Years of Service	All Members
0	20.00%
1	20.00
2	15.00
3	14.00
4	13.00
5	12.00
6	10.00
7	9.00
8	8.00
9	7.00
10	6.00
11	5.00
12	4.50
13	4.00
14	4.00
15	4.00
16	3.50
17	3.50
18	3.50
19	3.00
20	3.00
21	3.00
22	2.50
23	2.50
24	2.50
25	2.00
26	2.00
27	2.00
28	2.00
29	2.00

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

Members who terminate with at least five years of service (10 years of service for Tier 2 members) are assumed to elect the most valuable option on a present value basis – refund of contributions or a deferred benefit.

Termination rate for 29 years of service used for Tier 2 members until retirement eligibility is met.

Operational Expenses. The amount of operational expenses for administration incurred in the latest fiscal year are supplied by SURS staff and incorporated in the Normal Cost. Estimated administrative expenses for FY 2021 and after are assumed to increase by 3.25%.

Marital Status. Members are assumed to be married in the following proportions:

Age	Males	Females
20	25 %	40 %
30	70	75
40	80	80
50	85	80
60	85	70

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

Benefit Commencement Age. Inactive members eligible for a deferred benefit are assumed to commence benefits at their earliest normal retirement age. For Tier 1 members this is age 62 with at least five years of service, age 60 with at least eight years of service or immediately if at least 30 years of service. For Tier 2 members, this is age 67 with 10 or more years of service.

Load on Final Average Salary. No load is assumed to account for higher than assumed pay increases in final years of employment before retirement.

Load on Liabilities for Service Retirees With Non-finalized Benefits. A load of 10% on liabilities for service retirees whose benefits have not been finalized as of the valuation date is assumed to account for finalized benefits that on average are 10% higher than 100% of the preliminary estimated benefit. A load of 5% is used if a "best formula" benefit was provided in the data by Staff.

Valuation of Inactives. An annuity benefit is estimated based on information provided by staff for Tier 1 inactive members with five or more years of service and Tier 2 members with 10 or more years of service.

Assumption for Missing Data. Members with an unknown gender are assumed to be female. Active and inactive members with an unknown date of birth are assumed to be 37 years old at the valuation date. An assumed spouse date of birth is calculated for current service retirees in the traditional plan for purposes of calculating future survivor benefits. The female spouse is assumed to be three years younger than the male spouse. 70% of current total male retirees and 80% of current total female retirees in the traditional plan who have not elected a survivor refund are assumed to have a spouse at the valuation date.

Reciprocal Service. Reciprocal service is included for current inactive members for purposes of determining vesting eligibility and eligibility age to commence benefits.

The recently updated actuarial assumptions (including retirement and termination rates) were based on SURS service only. Therefore, reciprocal service was not included for current active members.

Projection Assumptions. The number of total active members throughout the projection period will remain the same as the total number of active members in the defined benefit plans and the SMP in the current valuation.

Future new hires are assumed to elect to participate in the offered plans as follows:

- 30% elect to participate in the Self Managed Plan.
- 70% elect to participate in the Tier 2 Plan.
    - 76% are assumed to elect the Traditional Plan (consistent with the current election split).
    - 24% are assumed to elect the Portable Plan (consistent with the current election split).

New entrants have an average age of 36.9 and average capped pay of $39,988 and average uncapped pay of $41,866 (2019 dollars). These values are based on the average age and average pay of current members. The range profile is based on the age at hire and assumed pay at hire (using the actuarial assumptions, inflated to 2019 dollars) of current active members with service between one and four years.

		Average Pay			Average Pay			Average Pay	
Age	Number Males	Capped Male	Uncapped Male	Number Females	Capped Female	Uncapped Female	Total Number	Capped Total	Uncapped Total
<20	59	$18,316	$18,316	60	$17,416	$17,416	119	$17,862	$17,862
20 - 24	649	30,264	30,264	1,112	29,195	29,195	1,761	29,589	29,589
25 - 29	1,445	41,284	41,661	2,105	38,665	38,941	3,550	39,731	40,048
30 - 34	1,313	47,706	50,717	1,799	43,179	44,887	3,112	45,089	47,347
35 - 39	942	47,102	50,701	1,376	41,440	43,236	2,318	43,741	46,270
40 - 44	636	45,983	49,788	1,028	40,876	42,474	1,664	42,828	45,269
45 - 49	525	44,644	48,405	865	36,525	37,533	1,390	39,592	41,640
50 - 54	459	44,548	49,752	698	35,673	38,096	1,157	39,194	42,720
55 - 59	352	42,786	50,369	553	33,375	35,592	905	37,036	41,340
60 - 64	202	34,386	39,531	242	32,861	36,244	444	33,555	37,739
65 - 69	11	21,418	33,106	12	19,715	19,715	23	20,530	26,119
Total	6,593	$42,888	$45,695	9,850	$38,047	$39,303	16,443	$39,988	$41,866

SMP Contribution Assumptions. The projected SMP contributions are equal to 7.6% of SMP payroll, plus estimated SMP expenses minus SMP employer forfeitures. Estimated SMP expenses for FY 2020 are $596,786 and actual FY 2019 SMP employer forfeitures used to reduce the certified contributions for FY 2021 are $6,578,294 (as provided by SURS). Estimated SMP expenses for FY 2021 and after are assumed to increase by 3.25%. Estimated SMP employer forfeitures used to reduce the certified contributions for FY 2022 and after are assumed to be 7.5% of the gross SMP employer contribution.

Pensionable Earnings Greater than 6%. The participant's employer is required to pay the present value of the increase in benefits resulting from the portion of the increase in excess of 6.00% for earnings used in the calculation of the final average salary. The projections include a component paid for by employers for earnings increases greater than 6.00% in the calculation of the final average salary.

Governor's Pay. The governor's pay is $177,500 as of June 30, 2019, and is expected to increase each year by the assumed rate of increase in the Tier 2 pay cap (1/2 the increase in CPI or 1.125%).

Buyout Election Assumption. 0% of eligible Tier 1 active members are assumed to elect to receive a reduced and delayed AAI benefit at retirement and an accelerated pension benefit option in accordance with Public Acts 100-0587 and 101-0010. 0% of eligible inactive members are assumed to elect to receive an accelerated pension benefit option in lieu of an annuity at retirement in accordance with Public Acts 100-0587 and 101-0010.

Treatment of Benefits in Excess of the Internal Revenue Code Section 415 Limits. The benefit amounts in excess of the IRC Section 415 limits for current retirees are paid through the Excess Benefit Arrangement (EBA) and are not reported in the actuarial valuation data. Therefore, the liabilities and the required contributions for these EBA benefits are not reflected in the actuarial valuation results. The amount of the estimated EBA payments for the upcoming fiscal year are provided by SURS Staff and included in the Statutory contribution requirement. Following are the estimates:

Valuation Year	Applicable Fiscal Year	Estimated EBA payments
2018	2020	$17.065 million
2019	2021	$18.000 million

Estimated Federal/Trust Fund Employer Contributions. Following are the estimated employer contributions provided by SURS that reduce the estimated State contributions.

Valuation Year	Applicable Fiscal Year	Estimated federal/trust fund payments
2018	2020	$52.0 million
2019	2021	$52.5 million

APPENDIX H

SUMMARY OF BENEFIT PROVISIONS OF SURS

Summary of Benefit Provisions of SURS

It should be noted that the purpose of this Appendix is to describe the benefit structures of SURS for which actuarial values have been generated. There is no description of the Self Managed Plan (SMP) and many portions of the defined plans are described in a manner which may not be legally complete or precise.

It is not our intent to provide an exhaustive description of all benefits provided under SURS or the policies and procedures utilized by SURS staff. A more precise description of the provisions of SURS is contained in the Member's Guide, published by SURS staff. Of course, the statute is controlling.

Plans

There are two defined benefit plans available under SURS, the Traditional Plan and the Portable Plan, and one defined contribution plan, the Self Managed Plan (SMP). A Member must select one of these plans within the first six months of participation. If no choice is made in that time, the Traditional Plan is deemed chosen.

New tiers of benefits have been established for members hired on or after January 1, 2011 ("Tier 2"). Members hired before January 1, 2011, participate in Tier 1. Members in Tiers 1 and 2 are eligible to choose either the Traditional or the Portable Plan. **SURS is currently not moving forward with the implementation of the optional hybrid plan created under PA 100-0023. Additional clarifying legislation is needed for SURS to be able to do so.**

Tier 2 members who participate in the Traditional and Portable Plans are subject to the pay caps established under Public Act 96-0889. The Tier 2 pay cap was $106,800 in 2011 and increases by the lesser of (1) 3% and (2) ½ the increase in the Consumer Price Index-Urban ("CPI-U") for the 12 months ending with the September proceeding each November 1.

The pay cap history is as follows:

Year	CPI-U	½ CPI-U	Tier 2 Pensionable Pay Cap
2011			$106,800.00
2012	3.90%	1.95%	$108,882.60
2013	2.00%	1.00%	$109,971.43
2014	1.20%	0.60%	$110,631.26
2015	1.70%	0.85%	$111,571.63
2016	0.00%	0.00%	$111,571.63
2017	1.50%	0.75%	$112,408.42
2018	2.20%	1.10%	$113,644.91
2019	2.30%	1.15%	$114,951.83

The Tier 2 pay cap is calculated annually by the Illinois Department of Insurance.

The Self Managed Plan is a defined contribution plan under which members contribute 8.0% of compensation and the State contributes 7.6% of compensation. A portion of the employer contribution is used to fund disability benefits for SMP participants. Members hired on or after January 1, 2011, who participate in the SMP are not subject to the Tier 2 pay cap.

The provisions of the Traditional and Portable defined benefit plans are identical in many areas. The description below is primarily of the Traditional Plan. Where different, the Portable plan provisions will be described in *italics.*

Member Contributions

Most members in Tier 1 and Tier 2 contribute a total of 8% of pensionable compensation. Police officers and firefighters contribute a total of 9.5% of pensionable compensation, with the additional 1.5% allocated to the retirement annuity.

The total contribution is broken down as follows:

	Tier 1 and Tier 2	
	Police/Fire	All Others
Retirement Annuity	8.0%	6.5%
Survivor Benefits	1.0%	1.0%
Annual Increases in Retirement	0.5%	0.5%
Total Contribution	9.5%	8.0%

Portable Plan members contribute the same percent of compensation, but the breakdown set out above does not apply.

The retirement annuity portion of the total contribution (8.0% of compensation for police officers and firefighters and 6.5% of compensation for all others) is annuitized for the money purchase formula (Rule 2) calculation for Tier 1 members.

Contributions for Tier 2 members are assumed not to be made on pay in excess of the pay cap.

Since January 1, 1981, the member contributions under SURS have been “picked up” for IRS purposes by employers.

Effective Rate of Interest

The Effective Rate of Interest (“ERI”) is the interest rate that is applied to member contribution balances. Effective for the 2006 fiscal year, the ERI for the purpose of determining the money purchase benefit is established by the State Comptroller annually. The ERI for other purposes such as the calculation of purchases of service credit, refunds for excess contributions, portable plan refunds and lump sum portable retirements is determined by the SURS Board annually and certified to the Governor. For purposes of the actuarial valuation, the assumed ERI is 6.75% beginning with the actuarial valuation as of June 30, 2018.

For the purposes of withdrawal of contributions at termination or death by Traditional Plan Members, this rate is not greater than 4.5% by statute.

Retirement Benefits

Final Average Salary

Final average salary is equal to:

Tier 1	High four consecutive year average compensation or the average of the last 48 consecutive months of employment.
Tier 2	High final eight consecutive year average compensation within the last 10 years or the average of the last 96 consecutive months within the last 120 months.

The Tier 2 pay cap history is shown in a table earlier in this section. We have assumed that the pay cap each year applies to the individual pay amounts that are used to develop the final average compensation.

The present value of the benefits for pay increases in excess of 6% during the final average earnings period immediately preceding retirement will be paid by the employer. The employer will pay this amount in a lump sum to the Retirement System.

Normal Retirement

Eligibility

For Tier 1 police officers and firefighters, separation from service on or after the attainment of the earlier of:

1. Age 55 with 20 years of service; or
2. Age 50 with 25 years of service.

For all other Tier 1 members and for all Tier 2 and Optional Hybrid Plan members, separation from service on or after attainment of the earlier of:

Tier 1	Tier 2
Age 62/5 Years	Age 67/10 Years
Age 60/8 Years	
Any age/30 Years	

Initial Benefit Amount

There are three alternate formulae. The initial benefit is the largest produced by one of the three:

1. General Formula (Applicable to all Tiers)
2. Money Purchase Formula (Applicable to Tier 1 only, hired before July 1, 2005)
3. Minimum Benefit(Applicable to all Tiers)

Following is a description of the benefits provided under each of the three alternate formulae.

1. General Formula (Applicable to all Tiers): The following percentages of final average compensation for each year of service:

	Tier 1 and Tier 2	
Year of Service	General	Police/Fire
1st 10 Years	2.20 %	2.25 %
Next 10 Years	2.20	2.50
Over 20	2.20	2.75

2. Money Purchase Formula (Applicable to Tier 1 only, hired before July 1, 2005):

   a) The member contributions for retirement benefits (8.0% of compensation for police officers and firefighters and 6.5% of compensation for all others) accumulated with interest at the ERI, plus

   b) An imputed employer contribution match at $1.40 per dollar of member contribution accumulated with interest at the ERI.

   c) The total of the accumulations in (a) and (b) is converted into an annuity using a life annuity factor that takes into account neither the automatic 50% spousal survivor benefit nor the automatic annual increases.

   Members hired on or after July 1, 2005 no longer receive the Money Purchase Formula under the plan.

3. Minimum Benefit(Applicable to all Tiers) – A benefit for each year of service, up to 30, based on final annual pay, as follows:

Under 3,500	$ 8
$3,500 - $4,500	9
$4,500 - $5,500	10
$5,500 - $6,500	11
$6,500 - $7,500	12
$7,500 - $8,500	13
$8,500 - $9,500	14
Over $9,500	15

   Minimum Retirement Annuity – No retiree shall receive a retirement annuity less than $25 per month for each year of service up to 30. The comparable benefit for survivor benefit recipients is $17.50 per month for each year of service up to 30.

Maximum Benefit

All Tiers have a maximum benefit equal to 80% of final average compensation.

Contribution waivers are applicable to members whose benefits are capped at 80% of final average compensation. Member contributions made once the maximum benefit is achieved are refunded to the member with interest (at the Effective Rate of Interest).

Benefit Duration

The Normal Retirement benefit is payable for the lifetime of the retired member. If the retiree under the Traditional Plan has a spouse at date of retirement and if that spouse survives the retiree the spouse will receive, upon the death of the retiree, a survivor benefit equal to the following percentage of the monthly benefit being paid to the retiree as of the date of death.

1. The survivor benefit for Tier 1 members is equal to 50% of the monthly benefit being paid to the retiree as of the date of death.
2. The survivor benefit for Tier 2 members is equal to 66 2/3% of the monthly benefit being paid to the retiree as of the date of death.

Such benefit will continue for the lifetime of the surviving spouse.

For retirees under the Portable Plan, the normal form of benefit is a single-life annuity for unmarried participants and a reduced 50% joint and survivor benefit for married participants. With spousal consent, a member may designate a contingent annuitant to receive a joint and survivor annuity or elect a single-life annuity or lump sum distribution. Those receiving a joint and survivor annuity will have their benefit reduced to cover the cost of the option. The available joint and survivor options are 50%, 75% and 100%. A member may elect the 75% or 100% spousal joint and survivor annuity without consent.

Portable Plan members may also elect to receive their retirement benefit as a lump sum equal to member contributions with an equal employer match (if have the required years of service), accumulated with interest (at the Effective Rate of Interest that is certified annually by the SURS Board).

The required years of service is five years for all plans. (Must have 10 years if retirement age.)

Annual Increases

For Tier 1 members who have not elected the Automatic Annual Increase (AAI) buyout, each January 1 subsequent to retirement date, the monthly benefit being paid each retiree shall be increased by 3% (compound COLA). The adjustment for the first January after retirement shall be proportional based on the portion of the year retired. See page 76 for a description of the increase for members who have elected the AAI buyout.

For Tier 2 members, each January 1 subsequent to retirement date, the monthly benefit being paid each retiree shall be increased by fifty percent of the Consumer Price Index-Urban ("CPI-U") up to a maximum of 3% applied to the original benefit (simple COLA). The first increase will be granted upon the later of the attainment of age 67 or the first anniversary of the commencement of the annuity.

The historical development of the Tier 2 Annual Increase as determined by the Illinois Department of Insurance can be found in the following table.

Year	CPI-U	½ CPI-U	Annual Increase
2011			3.00%
2012	3.90%	1.95%	1.95%
2013	2.00%	1.00%	1.00%
2014	1.20%	0.60%	0.60%
2015	1.70%	0.85%	0.85%
2016	0.00%	0.00%	0.00%
2017	1.50%	0.75%	0.75%
2018	2.20%	1.10%	1.10%
2019	2.30%	1.15%	1.15%

Early Retirement

Eligibility

For Tier 1 members other than police and fire employees, separation from service on or after attainment of age 55 with 8 years of service, but not eligible for Normal Retirement.
For Tier 2 members, separation from service on or after attainment of age 62 with 10 years of service, but not eligible for Normal Retirement.

Benefits

The benefit amounts and all terms of benefit payment are the same as that for Normal Retirement, except that the benefit amounts calculated under the General Formula and the Minimum Formula shall be reduced by .5% for each month by which the retirement date precedes the 60th birthday for Tier 1 members and the 67th birthday for Tier 2 members.

Benefits on Death before Retirement

Survivor Benefits

Traditional Plan

Eligibility

Payable to eligible survivor(s) (spouse, child or dependent parent) for the death of an active member with at least 1.5 years of service or a terminated member with at least 10 years of service. For this purpose, service under the State Employees' Retirement System, the Teachers' Retirement System of the State of Illinois and the Public School Teachers' Pension Fund of Chicago is recognized.

Benefits

For Tier 1 members, an annuity to the eligible survivor(s) equal to the greater of:

1. 50% of the benefit accrued to the date of the death of the member, and
2. The lowest applicable benefit from the following list:
   a) $400 per month to a single eligible survivor or $600 per month to two or more eligible survivors.
   b) 30% (one survivor), or 60% (two survivors), or 80% (three or more survivors) of the member's final rate of earnings.
   c) If member inactive, 80% of base retirement annuity.

For Tier 2 members, an annuity to the survivor(s) equal to 66 2/3% of the benefit accrued to the date of the death of the member.

Supplemental Minimum Survivor Annuity of $17.50 per month times number of years of service credit, up to 30 years. No annual increases payable on the supplemental minimum survivor annuity.

Benefit Duration

Surviving spouse
May receive a lifetime benefit commencing at the later of the day following the member's date of death and the spouse's attainment of age 50. May be payable the day following the member's date of death if a dependent child in their care is also receiving benefits.

Dependent child
Payable to unmarried child(ren) under age 18 (over 18 if disabled prior to age 18), and children age 18-22 if a qualified full-time student.

Dependent parent
Payable to a parent of the member who was dependent upon the member at the time of their death. Payable at the later of the day following the member's date of death and the parent's attainment of age 55. The benefit continues until the parent dies.

Annual Increases

For Tier 1 members, each January 1 subsequent to retirement date the monthly benefit being paid each survivor annuity recipient shall be increased by 3%. The first increase begins with the first January closest to the first anniversary of the survivor annuity.

For Tier 2 members, each January 1 subsequent to retirement date the monthly benefit being paid each survivor annuity recipient shall be increased fifty percent of the Consumer Price Index-Urban ("CPI-U") up to a maximum of 3% of the originally granted survivor annuity (simple COLA). The first increase will be granted upon January 1 following the first anniversary of the commencement of the survivor annuity.

Portable Plan

Eligibility

Payable to an eligible spouse for the death of an active or inactive member with at least 1.5 years of SURS service.

Benefits

An annuity to the eligible spouse equal to 50% of the member's earned retirement benefit after the reductions to pay for the cost of providing the pre-retirement survivor annuity. (Applicable to Tier 1 and Tier 2 members.)

Benefit Duration

Surviving spouse
May receive a lifetime benefit commencing at the member's earliest retirement age.

Annual Increases

For members hired before January 1, 2011 and for all members hired on or after January 1, 2011, each January 1 subsequent to retirement date the monthly benefit being paid each survivor annuity recipient shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

Lump Sum Death Benefit

Eligibility

Death of member prior to retirement.

Traditional Plan

Benefit

With Eligible Survivor

- 7/8ths of accumulated member contributions balance (includes all contributions and interest)

Without Eligible Survivor

- Refund of the total accumulated member contribution and interest; and
- An amount up to $5,000 based on the annual final average earnings amount to a dependent beneficiary or $2,500 to a non-dependent beneficiary. The additional death benefit is only

payable if the member was active at death. If the member was inactive, this additional death benefit is not payable.

Portable Plan

Benefit

With Eligible Spouse

- Refund of total accumulated member contributions at the full Effective Rate of Interest, plus, if the member has at least 1.5 years of service at death, a like amount of imputed employer contributions – less the actuarial equivalent of the Pre-Retirement Survivor Annuity.

Without Eligible Spouse

- Refund of total accumulated member contributions at the full Effective Rate of Interest, plus, if the member has at least 1.5 years of service at death, a like amount of imputed employer contributions.

Benefits on Death after Retirement

In addition to survivor/spouse benefits payable from the System, the following death benefit is payable if a member does not have an eligible survivor/spouse/contingent annuitant:

- The greater of the total accumulated member contributions and interest minus the total retirement annuities paid to the member through the date of their death or $1,000.

Eligibility

Payable to eligible survivor(s) (spouse, child or dependent parent) as long as the member did not take a refund of their survivor contributions at retirement.

Traditional Plan

Benefits

For Tier 1 members, an annuity to the eligible survivor(s) equal to the greater of:

1. 50% of the annuity at the time of the member's death:
2. The lowest applicable benefit from the following list:
   a) $400 per month to a single eligible survivor or $600 per month to two or more eligible survivors.
   b) 30% (one survivor), or 60% (two survivors), or 80% (three or more survivors) of the member's final rate of earnings.
   c) 80% of base retirement annuity.

For Tier 2 members, an annuity to the survivor(s) equal to 66 2/3% of retirement annuity at the time of the member's death.

Supplemental Minimum Survivor Annuity of $17.50 per month times number of years of service credit, up to 30 years. No annual increases payable on the supplemental minimum survivor annuity.

Benefit Duration

Surviving spouse

May receive a lifetime benefit commencing at the later of the day following the member's date of death and the spouse's attainment of age 50. May be payable the day following the members' date of death if a dependent child in their care is also receiving benefits.

Dependent child

Payable to unmarried child(ren) under age 18 (over 18 if disabled prior to age 18), and children age 18-22 if a qualified full-time student.

Dependent parent

Payable to a parent of the member who was dependent upon the member at the time of their death. Payable at the later of the day following the member's date of death and the parent's attainment of age 55. The benefit continues until the parent dies.

Portable Plan

Benefits

A 50%, 75% or 100% Joint and Survivor annuity is payable to the Contingent Annuitant that the member chose at the time of retirement, if any. The member's retirement annuity is reduced to pay for the Joint and Survivor Annuity.

Benefit Duration

Surviving spouse

May receive a lifetime benefit commencing at the member's earliest retirement age.

Annual Increases

For members hired before January 1, 2011 and for all members hired on or after January 1, 2011, each January 1 on or after the survivor annuity shall be increased by 3% compounded. The first AAI begins with the January 1 on or after the commencement of the survivor annuity if retired January 14, 1991 or later. If the member retired prior to January 14, 1991, then January 1 on or closest to the 1st anniversary of the Survivor Annuity shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

Benefits for Disability

Disability Benefit

Eligibility

Disablement after completing two years of service. The service requirement is waived if the disablement is accidental.

Disability definition – inability to perform the duties of "own occupation."

Pregnancy and childbirth are, by definition, disablement.

Benefit

The greater of 50% of the basic compensation paid at date of disablement or 50% of the average earnings for the 24 months prior to the date of disablement. This base benefit level is offset dollar for dollar by each of the following:

1. Earnings while disabled in excess of the disability benefit.
2. Other disability insurance either fully or partially employer provided.
3. Worker's compensation benefits.

Duration of Benefit

Benefits become payable on the later of the termination of salary and sick leave, or the 61st day after disablement and continue to the earlier of the following:

1. Recovery or death.

2. Benefits paid equal 50% of total compensation during the period of SURS service.

3. If disablement occurs prior to age 65, the disability benefit may not continue past the August 31 following 70th birthday.

4. If disablement occurs at or after attainment of age 65, completion of five years in disablement.

Survivor and death benefits are payable if a member dies while receiving disability benefits.

If, at discontinuance of the disability benefit, the member is eligible for a retirement benefit (based on service, which includes the period of disability and may also include time receiving a disability retirement annuity), the member may retire and receive that benefit. The member may commence the retirement benefit once age and service requirements are met. The early retirement reduction does not apply for members who began first participating prior to January 1, 2011 (Tier 1). The benefit is based on the greatest of three formulas (General Formula, Money Purchase and Minimum Benefit), subject to applicable maximums. Contributions are not made during the disability period. However, accumulated contributions continue to accrue interest.

Annual Increases

Each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

Disability Retirement Annuity

Eligibility

Continuing disablement after discontinuation of the disability benefit as a result of reaching the "50% of total earnings" limitation. Disability is defined in accordance with the Social Security disability definition.

Benefit

35% of the compensation being earned at disablement.

Duration of Benefit

Benefits become payable upon discontinuance of the disability benefit and continue to the earlier of the following:

1. Recovery or death
2. Election to receive a retirement benefit

Survivor and death benefits are payable if a member dies while receiving a disability retirement annuity.

Annual Increases

Each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased by 3%. The adjustment for the first January after retirement shall be proportional.

For members hired on or after January 1, 2011, if the member converts to a service retirement annuity (item 2 above), each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased fifty percent of the Consumer Price Index ("CPI") up to a maximum of 3% of the originally granted benefit. The first increase will be granted upon the later of the attainment of age 67 or the first anniversary of the commencement of the annuity.

Benefits for Deferred Members

Eligibility

For members hired before January 1, 2011, separation from employment with at least five years of service and separation from employment with at least 10 years of service for members hired on or after January 1, 2011.

Benefit

Benefit as defined for normal retirement purposes, but calculated based on final average compensation and service at date of termination.

Commencement of Benefit

Benefits commence when member reaches the age condition for either normal or early retirement.

Annual Increases

For members hired before January 1, 2011 who have not elected the AAI buyout, each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased by 3%. The adjustment for the first January after retirement shall be proportional. See page 76 for a description of the increase for members who have elected the AAI buyout.

For members hired on or after January 1, 2011, each January 1 subsequent to retirement date the monthly benefit being paid each retiree shall be increased fifty percent of the Consumer Price Index ("CPI") up to a maximum of 3% applied to the original benefit. The first increase will be granted upon the later of the attainment of age 67 or the first anniversary of the commencement of the annuity.

Member Refunds

Non-vested terminated members and members who elect a refund in lieu of a vested benefit receive the following amounts.

Traditional Plan

Refund of the total accumulated member contribution at 4.5% interest.

Portable Plan

Refund of total accumulated member contributions at the full Effective Rate of Interest that is certified annually by the SURS Board, plus, if the member has the required years of service, a like amount of imputed employer contributions.

The required years of service is five years for all plans. (Must have 10 years if retirement age.)

Accelerated Pension Benefit Options

Under Public Act (PA) 100-0587 and PA 101-0010, SURS shall offer an accelerated pension benefit payment to eligible members beginning on the implementation date and until June 30, 2024.

There are two accelerated pension benefit payment options that will be offered:

1. For vested inactive members, a payment equal to 60% of the present value of the member's pension benefit in lieu of receiving any pension benefit.

2. For members eligible for retirement, a payment equal to 70% of the difference between: (i) the present value of the automatic annual increases (AAI) to a Tier 1 member's retirement and survivor's annuity under the current AAI provisions and (ii) the present value of the automatic annual increases to the Tier 1 member's retirement annuity under revised AAI provisions

    a. The current AAI provisions are an annual 3% increase of the prior year's benefit (compound COLA) payable as of the January 1 following the annuity start date (first increase is prorated).
    b. The revised AAI provisions are an annual 1.5% increase of the originally granted benefit (simple COLA) payable as of the later of age 67 or the first anniversary of the annuity start. The survivor AAI is first payable 1 year after the survivor annuity commences.

APPENDIX I

GLOSSARY OF TERMS

Actuarial Accrued Liability ("AAL"). The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Actuarial Assumptions. Estimates of future plan experience such as investment return, expected lifetimes and the likelihood of receiving a pension from the Pension Plan. Demographic, or "people" assumptions, include rates of mortality, retirement and separation. Economic, or "money" assumptions, include expected investment return, inflation and salary increases.

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

Actuarial Present Value of Future Plan Benefits ("APV"). The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Actuarial Value of Assets ("AVA"). Smoothed value of assets that recognizes the difference between the expected investment return using the valuation assumption of 8.0 percent and the actual investment return over a five-year period. Dampens volatility of asset value over time.

Actuarially Determined Contribution ("ADC"). The sum of the gross normal cost (including employee contributions) and amortization of the unfunded actuarial accrued liability over a period not to exceed 30 years.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Annual Required Contribution ("ARC"). The sum of the normal cost (net of employee contributions) and amortization of the unfunded actuarial accrued liability over a period not to exceed 30 years. Was required for accounting purposes by the Governmental Accounting Standards Board (GASB) Statement Nos. 25 and 27.

Asset Return. The net investment return for the asset divided by the mean asset value. Example: if $1.00 is invested and yields $1.0675 after a year, the asset return is 6.75 percent.

Funded Ratio. The actuarial value of assets divided by the actuarial accrued liability. Measures the portion of the actuarial accrued liability that is currently funded.

Market Value of Assets ("MVA"). The value of assets currently held in the trust available to pay for benefits of the Pension Plan. Each of the investments in the trust is valued at market price which is the price at which buyers and sellers trade similar items in the open market.

Glossary of Terms

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

Unfunded Actuarial Accrued Liability ("UAAL"). The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."