

State Universities Retirement System of Illinois



Actuarial Valuation Report as of
June 30, 2017

DRAFT



October 6, 2017

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, 2017. 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, 2019, 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. Under the provisions of PA 100-0023, employers make contributions beginning in fiscal year 2018 for new members and for the portion of payroll for current members in excess of the Governor's pay. 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.

This actuarial valuation is based on the provisions of SURS in effect as of June 30, 2017, data on the SURS membership and information on the asset value of the trust fund as of that date. This valuation does not reflect the provisions of Public Act 98-0599 due to the court ruling recent pension reform 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.

The benefit provisions for members hired on or after January 1, 2011, were changed under Public Act 96-0889. PA 100-0023, which is effective July 6, 2017, creates a new plan option (Optional Hybrid Plan) which is assumed to be available for members to elect beginning July 1, 2019. Assumed new hires in the actuarial valuation projections were valued under the benefit provisions of Public Act 96-0889 and Public Act 100-023 (60% of new hires are assumed to elect the Optional Hybrid Plan under PA 100-023, 20% are assumed to elect the Self-Managed Plan, and 20% are assumed to elect Tier 2 under Public Act 96-0889).

The actuarial cost method (Projected Unit Credit, as required by statute) and the asset smoothing method (as required by statute) and all other assumptions and methods used in this actuarial valuation (except actuarial assumptions applicable under PA 100-0023) are unchanged from the prior June 30, 2016, actuarial valuation recertification of SURS. Under PA 100-0023, the fiscal year 2018 statutory State contribution requirement was recertified to reflect the provisions contained in the Public Act. The plan election assumptions were provided by SURS staff.

To the best of our knowledge, this actuarial statement is complete and accurate, fairly presents the actuarial position of SURS as of June 30, 2017, 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 (27 years remaining in the actuarial valuation as of June 30, 2017).

The signing actuaries are independent of the plan sponsor.

Amy Williams, Lance J. Weiss and Alex Rivera are Members of the American Academy of Actuaries ("MAAA") and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

Respectfully submitted,

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SUMMARY OF THE VALUATION

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Summary of the Valuation

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, 2017.

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, (1) for the fiscal year ending June 30, 2019, 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) for FY 2019 is \$1.706 billion, and includes the State’s projected normal cost of \$402.6 million, an unfunded liability contribution of \$1.238 billion and the Self Managed Plan (“SMP”) contribution of \$64.6 million. The 2016 actuarial valuation recertification had projected the Statutory contribution would increase, from \$1.680 billion for FY 2018 to \$1.746 billion for FY 2019. (Under PA 100-0023, the fiscal year 2018 statutory State contribution requirement was recertified to reflect the provisions contained in the Public Act.) The key reasons for the decrease in the Statutory contribution over the projected amount from the prior actuarial valuation are 1) favorable demographic experience and 2) actual fiscal year 2017 investment rate of return greater than the assumed rate of 7.25%.

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 and 2017. However, SURS incurred investment losses (or shortfalls in return compared to the actuarial assumption) in fiscal years 2008, 2009, 2012, 2015 and 2016. The market return for the year ending June 30, 2017, was approximately 12.20% compared to a return of 0.22% in FY 2016. The average market value investment return over the most recent 10 years has been approximately 5.4%.

The funded ratio increased from 41.6% as of June 30, 2016, to 44.1% as of June 30, 2017, based on the market value of assets, and increased from 43.3% as of June 30, 2016, to 44.4% as of June 30, 2017, based on the actuarial value of assets. The net deferred asset losses will be recognized in the actuarial value of assets over the next four years.

The ratio of the market value of assets to the annual deductions (benefit payments, refunds of contributions and administrative expenses) is about 7.5.

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

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employer contributions and future investment return.

Actuarial Assumptions

The Board voted to decrease the investment return assumption from 7.75% to 7.25% as of June 30, 2014, and to decrease the Effective Rate of Interest (“ERI”) assumption from 7.75% to 7.00% as of June 30, 2013. 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 were updated due to the provisions to Public Act 100-0023 which added another plan option for new hires. Future new hires were assumed to elect to participate in the offered plans as follows: 60% would elect to participate in the Optional Hybrid Plan (“OHP”), 20% would elect to participate in the Self-Managed Plan (SMP) and 20% would elect to participate in the Tier 2 Plan. The plan election assumptions were provided by SURS staff.

All other actuarial assumptions were first adopted by the Board for use with the actuarial valuation as of June 30, 2015, and were based on the recommendations from the experience review performed for the period from June 30, 2010, through June 30, 2014.

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 and by the pay cap for members in the Optional Hybrid Plan. The basis for this assumption comes from 40 ILCS 5/1-160 (b-5) for Tier 2 and 40 ILCS 5/1-161(e) for the Optional Hybrid Plan.

SURS Benefits

The benefit provisions valued in this June 30, 2017, actuarial valuation are identical to those valued in the prior actuarial valuation recertification as of June 30, 2016. The recertification as of June 30, 2016, incorporated the provisions of Public Act 100-0023. Due to the court ruling recent pension reform unconstitutional, this actuarial valuation does not reflect the provisions of Public Act 98-0599.

Experience During 2017

The System assets earned approximately 12.20% on a market value basis during FY 2017 which was greater than the investment return assumption of 7.25% for FY 2017. The System assets earned 8.04% on an actuarial value of assets basis during FY 2017, due to recognition of net deferred investment losses under the asset smoothing method. However, because 8.04% is greater than the assumed rate of investment return of 7.25% for FY 2017, there was an asset gain of \$137.4 million on the actuarial value of assets.

There was also a net gain of \$250.3 million from actuarial liabilities, which is comprised of a gain of approximately \$105.6 million from demographic experience, and a gain of \$144.7 million from lower than expected pay increases.

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The total gain or loss from liabilities for the system is calculated as follows (dollars in millions):

1. Actuarial Accrued Liability ("AAL") - Prior Year	\$ 40,923.3
2. Total Normal Cost - Prior Year ¹	719.2
3. Benefits and Administrative Expenses Paid in FY 2017	(2,444.3)
4. Interest on the above items 1, 2 and 3	2,905.5
5. Expected AAL 6/30/2017 (1+2+3+4)	42,103.7
6. Impact of Change in Actuarial Assumptions and Methods	0.0
7. Expected AAL 6/30/2017 After Assumption Changes (5+6)	42,103.7
8. Actual AAL 6/30/2017	41,853.4
9. Actuarial (Gain)/Loss on Liabilities (8-7)	\$ (250.3)

¹ Total Normal Cost from the previous actuarial valuation which includes both employee and employer portion.

The SURS defined benefit programs experienced an overall actuarial gain of \$387.7 million. The total net actuarial gain is the total of the gain from assets and the net gain from liabilities. The total actuarial gain for the year is as follows (dollars in millions):

1. Actuarial (Gain)/Loss on Assets	\$ (137.4)
2. Actuarial (Gain)/Loss on Liabilities	(250.3)
3. Total Actuarial (Gain)/Loss (1+2)	\$ (387.7)

The "behavior" 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. From last year to this year, there were gains on retirement and active mortality experience. Disability experience was about as expected and there was a termination loss, retiree mortality loss, and, as always, there was a new entrant loss. The new entrant loss occurs each year, but is offset by additional contributions to the assets. Data refinements also generated a gain. The other assumptions were so close that they generated very little actuarial gain or loss.

See Table 10 (page 24), Appendix C, for detail of the gains and losses by source.

Statutory Appropriations for the 2019 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 funding ratio of 90% by the end of fiscal year ("FY") 2045.

Summary of the Valuation

- 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 payroll¹ of active members of SURS based on the actuarial value of assets at the valuation date and assuming the actuarial value of assets earns the assumed investment return in the future.
- 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.
 - o 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:
 - o 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.)
 - o 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.
- c) After 2045, the Employer/State contribution rate is to be sufficient to maintain the funding level at 90%.
 - o Employers continue to make the required normal cost and unfunded liability contributions.
 - o The financial impact of changes in actuarial assumptions continue to be phased in over a five-year period

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.

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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.

Based on the actuarial value of assets, Employer/State contributions for FY 2018 and FY 2019 and estimates of the required contributions for the subsequent five fiscal years follow. The estimates for fiscal years 2020-2024 are calculated based on the expected actuarial value of assets at each of the future corresponding actuarial valuations, including the recognition of deferred gains and losses in future years as shown in Table 7 (page 21). State contributions for 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 are not included in the projected contributions for fiscal years 2018, 2019 and 2020. The Optional Hybrid Plan is expected to be established July 1, 2019, and members are expected to be able to first elect to participate beginning in fiscal year 2020.

Actuarial Valuation Date	Fiscal Year ¹	(in Millions)							Net Normal Cost
		60% of New Members to OHP, 20% to Tier 2, 20% to SMP			Statutory Contribution by Source				
		Estimated SURS ²	Estimated SMP ³	Total	Employer	Federal/Trust	State		
6/30/2016	2018	\$ 1,615.482	\$ 64.582	\$ 1,680.064	\$ 4.256	\$ 46.500	\$ 1,629.308	\$ 418.202	
6/30/2017	2019	1,641.115	64.574	1,705.689	4.146	46.000	1,655.543	402.624	
6/30/2018	2020	1,723.932	70.159	1,794.091	6.274	46.000	1,741.817	399.892	
6/30/2019	2021	1,806.165	72.729	1,878.894	5.954	46.000	1,826.940	388.795	
6/30/2020	2022	1,859.961	75.042	1,935.003	25.214	46.000	1,863.789	377.318	
6/30/2021	2023	1,894.101	77.403	1,971.504	30.702	46.000	1,894.802	365.967	
6/30/2022	2024	1,941.798	79.774	2,021.572	36.199	46.000	1,939.373	355.388	
Seven year total		\$ 12,482.554	\$ 504.263	\$ 12,986.817	\$ 112.745	\$ 322.500	\$ 12,551.572	\$ 2,708.186	

¹Total FY 2018 Contribution based on recertification of the June 30, 2016, actuarial valuation. FY 2019 Contribution and projected FY 2020- 2024 contributions based on June 30, 2017, actuarial valuation. The Statutory contribution does not include debt service.

²Projected SURS contribution based on a projection of current defined benefit plan members and assumption that 60% of new members elect the Optional Hybrid Plan and 20% of new members are elect the Tier 2 Plan.

³Projected Self Managed Plan ("SMP") contribution is based on projection of current SMP members and assumption that 20% of new members elect SMP, which is the defined contribution plan option.

The combined State and employer Statutory contribution (before adjustment for federal and trust funds)

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for FY 2019 is \$1,705,689,000. This is equal to a gross Statutory contribution of \$1,713,769,000 less \$8,080,000 in SMP forfeitures. The projected SMP contributions for FY 2020- 2024 are net of assumed projected SMP forfeitures.

The combined State and employer Statutory contribution increased from \$1.680 billion for fiscal year 2018 to \$1.706 billion for fiscal year 2019.

Estimates of Statutory contributions through 2045, assuming that 60% of future new members elect the Optional Hybrid Plan, 20% of future new members elect the Tier 2 Plan, 20% of future new members elect SMP and all other actuarial assumptions are realized, are set out in Table 14 (page 31).

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 shown in this report, adjusted by contributions from federal and trust funds. The estimated contributions from the federal and trust funds for FY 2019 is \$46,000,000.

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 \$17,005.6 million as of June 30, 2016, to \$18,457.6 million as of June 30, 2017. The actuarial value of assets as of June 30, 2017, is \$18,588.9 million, which is \$131.3 million higher 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 \$131.3 million, which is the value of net deferred losses, will be smoothed into the actuarial value of assets over the next four years. The remaining unrecognized net asset gains from FY 2014 and FY 2017 will be smoothed in over the next one and four years, respectively, and the remaining asset losses from FY 2015 and FY 2016 will be smoothed in over the next two and three 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 21) of Appendix C.

Funding Status

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

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As shown below, the SURS funding ratio increased from 41.6% as of June 30, 2016, to 44.1% as of June 30, 2017, based on the market value of assets, and increased from 43.3% as of June 30, 2016, to 44.4% as of June 30, 2017, based on the actuarial value of assets. There are net deferred losses that will be smoothed into the actuarial value of assets over the next four years. As a result of the net deferred losses and the funding policy, the funded ratio is projected to remain relatively flat over the next four years if all assumptions are realized and all employer contributions are made on a timely basis.

Fiscal Year	Funded Ratio	
	AVA	MVA
2013	41.5 %	43.7 %
2014	42.3	46.5
2015	43.3	44.2
2016	43.3	41.6
2017	44.4	44.1

The following table shows a comparison for fiscal years 2008 through 2017 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 increased from 42.3% as of June 30, 2016, to 43.4% as of June 30, 2017.

Percentage of Benefits Covered by Net Assets (in Millions)

Fiscal Year	Member Acc Contrib. (1)	Members Receiving Benefits (2)	Act/Inact Employer Portion (3)	Net Actuarial Value of Assets	% of Benefits Covered by Assets		
					(1)	(2)	(3)
2008	\$ 5,426.8	\$ 13,978.1	\$ 5,512.8	\$ 14,586.3	100.0%	65.5%	0.0%
2009	5,688.9	14,802.6	5,824.7	14,282.0	100.0%	58.1%	0.0%
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	18,588.9	100.0%	43.4%	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

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the current Statutory funding method. The reason for the 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 (27 years remaining as of June 30, 2018) level percentage of 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 27) and Graph 4 (page 32), the funded ratio would increase more quickly and require lower contributions than under the Statutory policy after approximately 15 years.

Below is a comparison of the actual SURS contribution (excluding SMP) for FY 2017, the projected statutory SURS contribution determined in the actuarial valuation as of June 30, 2015, and actuarially determined contribution amounts calculated based on normal cost plus amortization of the unfunded liability under an open and a closed 30-year period. Graph 5 (page 33) compares the Statutory contribution and actuarially determined contributions for FY 2015 through 2019. The Statutory contributions are projected to continue to rise in order to meet the ultimate funding objective of a 90% funded ratio in 2045.

\$ in Millions			
Actual	Projected	30-Year Open	30-Year Closed
\$1,651	\$1,650	\$1,689	\$1,942

Based on projections assuming that the Statutory contributions are made every year (as shown in Table 12, page 26) and an investment return of 7.25% each year, the funded ratio is projected to begin to increase from about 43% funded to 90% funded at 2045. The funded ratio is not projected to exceed 50% until 2030, 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 7.25%, the funded ratio will be lower and the cash flow strain will be higher. If another significant market downturn occurred while the System’s funded ratio is low, the System could be required to liquidate a large amount of 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 \$41.853 billion as of the end of FY 2017 to \$52.658 billion as of the end of FY 2045 (as shown in Graph 2, page 28, and Table 23, page 42). Total benefit payments are projected to increase from \$2.429 billion in fiscal year 2017 to \$4.495 billion in fiscal year 2045. Graph 3 (page 29, and Table 22, page 41) shows projected benefit payments separately for retirees as of June 30, 2017, active and inactive members as of June 30, 2017, 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.

Summary of the Valuation

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 capped payroll amortization 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)
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

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 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 2019 contribution would be \$2,060.980 (\$1,996.406 million for the SURS contribution and \$64.574 million for SMP) under this 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 and 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 32 and projected funded ratios are shown in Graph 1 on page 27.

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

Summary of the Valuation

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)

<u>Year</u>	<u>Actuarial Value of Assets</u>	<u>Market Value of Assets</u>	<u>Ratio of Actuarial Value to Market Value</u>
2009	\$ 14,281.998	\$ 11,032.973	129 %
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	18,588.873	18,457.553	101

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.

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.

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.

Summary of the Valuation

Future Considerations

Changes (such as 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 7.25% 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 44.4% 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 7.25% 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 2027 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

Summary of the Valuation

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, unless the market value of assets is used in the measurement.

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

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APPENDICES

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APPENDIX A

ASSET INFORMATION

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Table 1

Statement of Plan Net Position

as of June 30, 2017, and June 30, 2016

	Defined Benefit	Self Managed	Reporting Entity Totals	
	Plan	Plan	2017	2016
Assets				
Cash and short-term investments	\$ 477,639,944	-	\$ 477,639,944	\$ 731,633,307
Receivables				
Members	7,374,776	\$ 3,645,343	11,020,119	11,901,631
Non-employer contributing entity	305,971,283	1,793,737	307,765,020	231,780,027
Federal, trust funds, and other	1,589,630	13,451	1,603,081	1,470,551
Pending investment sales	420,174,075	-	420,174,075	433,893,516
Interest and dividends	45,835,923	-	45,835,923	42,366,778
Total receivables	780,945,687	5,452,531	786,398,218	721,412,503
Prepaid expenses	122,532	-	122,532	133,157
Investments, at fair value				
Equity investments	9,924,882,008	73,654,290	9,998,536,298	9,019,079,231
Fixed income investments	4,790,343,565	33,589,051	4,823,932,616	4,689,949,900
Real estate investments	1,031,466,029	2,659,777	1,034,125,806	988,848,965
Alternative investments	2,282,012,359	2,121,509	2,284,133,868	1,833,916,328
Mutual fund and variable annuities		2,052,773,940	2,052,773,940	1,723,653,945
Total investments	18,028,703,961	2,164,798,567	20,193,502,528	18,255,448,369
Securities lending collateral	705,137,291	-	705,137,291	602,404,484
Capital assets, at cost, net of accum deprec \$ 19,170,764 and \$ 19,100,014 respectively	6,312,533	-	6,312,533	6,249,153
Total assets	19,998,861,948	2,170,251,098	22,169,113,046	20,317,280,973
Liabilities				
Benefits payable	9,533,649	-	9,533,649	9,645,900
Refunds payable	5,513,152	-	5,513,152	6,459,653
Securities lending collateral	704,387,453	-	704,387,453	602,089,896
Payable to brokers for unsettled trades	806,727,942	-	806,727,942	853,366,668
Administrative expenses payable	15,147,162	-	15,147,162	14,583,115
Total liabilities	1,541,309,358	-	1,541,309,358	1,486,145,232
Plan Net Position	\$ 18,457,552,590	\$ 2,170,251,098	\$ 20,627,803,688	\$ 18,831,135,741

Table 2

Statement of Changes in Plan Net Position for Years Ended June 30, 2017, and June 30, 2016

	Defined Benefit	Self Managed	Reporting Entity Totals	
	Plan	Plan	2017	2016
Additions				
Contributions				
Employer	\$ 38,386,223	\$ 7,655,336	\$ 46,041,559	\$ 46,184,587
Non-employer contributing entity	1,612,164,501	59,261,499	1,671,426,000	1,601,480,000
Member	278,642,830	85,216,857	363,859,687	355,341,100
Total Contributions	<u>1,929,193,554</u>	<u>152,133,692</u>	<u>2,081,327,246</u>	<u>2,003,005,687</u>
Investment Income				
Net appreciation				
in fair value of investments	1,697,347,333	266,349,915	1,963,697,248	(256,708,352)
Interest	114,131,741	-	114,131,741	113,996,822
Dividends	213,500,029	-	213,500,029	220,725,192
Securities lending	5,885,222	-	5,885,222	4,215,195
Gross Investment Income	<u>2,030,864,325</u>	<u>266,349,915</u>	<u>2,297,214,240</u>	<u>82,228,857</u>
Less investment expense				
Asset management expense	63,291,609	-	63,291,609	61,614,201
Securities lending expense	529,670	-	529,670	379,368
Net investment income	<u>1,967,043,046</u>	<u>266,349,915</u>	<u>2,233,392,961</u>	<u>20,235,288</u>
Total additions	<u>3,896,236,600</u>	<u>418,483,607</u>	<u>4,314,720,207</u>	<u>2,023,240,975</u>
Deductions				
Benefits	2,339,897,357	43,922,036	2,383,819,393	2,281,769,695
Refunds of contributions	89,569,617	29,359,642	118,929,259	111,646,866
Administrative expense	14,847,009	456,599	15,303,608	15,210,543
Total deductions	<u>2,444,313,983</u>	<u>73,738,277</u>	<u>2,518,052,260</u>	<u>2,408,627,104</u>
Net increase	1,451,922,617	344,745,330	1,796,667,947	(385,386,129)
Plan Net Position				
Beginning of year	<u>17,005,629,973</u>	<u>1,825,505,768</u>	<u>18,831,135,741</u>	<u>19,216,521,870</u>
End of Year	<u>\$ 18,457,552,590</u>	<u>\$ 2,170,251,098</u>	<u>\$ 20,627,803,688</u>	<u>18,831,135,741</u>

APPENDIX B

MEMBERSHIP DATA

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Table 3A

Summary of Data Characteristics – Active, Inactive, Retired

(\$ in Millions)

	June 30, 2016		June 30, 2017	
	Number	Earnings	Number	Earnings
Active Members				
Full time				
Traditional SURS	43,721	\$2,213.5	42,307	\$2,172.4
Portable SURS	17,993	1,138.8	17,599	1,129.8
SMP	11,348	827.3	11,382	846.8
Total Full Time ¹	73,062	\$4,179.6	71,288	\$4,149.1
Part time				
Traditional SURS	3,874	\$ 28.3	3,605	\$ 25.9
Portable SURS	657	5.5	606	5.1
SMP	532	5.0	470	4.3
Total Part Time	5,063	\$ 38.8	4,681	\$ 35.4
Total	78,125	\$4,218.4	75,969	\$4,184.5
Inactive Members				
Traditional SURS	67,946		69,245	
Portable SURS	11,549		12,071	
SMP	9,041		9,503	
Total	88,536		90,819	

¹ Includes 685 police officers and firefighters (including SMP) as of June 30, 2016, and 671 as of June 30, 2017.

	Annual		Annual	
	Number	Benefits	Number	Benefits
Benefit Recipients				
Retirement				
Traditional SURS	48,318	\$ 1,905.5	49,081	\$ 1,967.8
Portable SURS	5,278	169.3	5,821	191.5
Total Retirement	53,596	\$ 2,074.8	54,902	\$ 2,159.3
Survivor				
Traditional SURS	8,308	\$ 147.7	8,415	\$ 156.4
Portable SURS	173	2.8	199	3.5
Total Survivor	8,481	\$ 150.5	8,614	\$ 159.9
Disability				
Traditional SURS	880	\$ 17.7	835	\$ 17.0
Portable SURS	189	4.6	194	5.0
Total Disability	1,069	\$ 22.2	1,029	\$ 22.0
Total	63,146	\$ 2,247.6	64,545	\$ 2,341.2
Total Participants				
Total Traditional SURS	173,047		173,488	
Total Portable SURS	35,839		36,490	
Total SMP	20,921		21,355	
Total	229,807		231,333	

Values may not add due to rounding.

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

	June 30, 2016		June 30, 2017	
	Number	Earnings	Number	Earnings
Active Members				
Full time				
Continuing Actives - Tier 1				
Traditional SURS	31,787	\$1,793.1	29,614	\$1,710.9
Portable SURS	12,336	866.9	11,515	829.0
SMP	6,481	492.6	6,107	474.5
Total	50,604	\$3,152.6	47,236	\$3,014.4
Continuing Actives - Tier 2				
Traditional SURS	8,927	\$354.0	9,797	\$397.7
Portable SURS	4,551	233.9	4,993	262.9
SMP	3,961	288.0	4,368	328.6
Total	17,439	\$875.9	19,158	\$989.2
New Actives - Tier 1				
Traditional SURS	378	\$8.6	345	\$7.9
Portable SURS	94	2.7	81	2.7
SMP	61	2.9	61	2.1
Total	533	\$14.1	487	\$12.7
New Actives - Tier 2				
Traditional SURS	2,629	\$57.8	2,551	\$55.9
Portable SURS	1,012	35.3	1,010	35.3
SMP	845	43.7	846	41.6
Total	4,486	\$136.9	4,407	\$132.9
Total Actives - Tier 1				
Traditional SURS	32,165	\$1,801.7	29,959	\$1,718.8
Portable SURS	12,430	869.6	11,596	831.6
SMP	6,542	495.5	6,168	476.6
Total	51,137	\$3,166.8	47,723	\$3,027.0
Total Actives - Tier 2				
Traditional SURS	11,556	\$411.8	12,348	\$453.6
Portable SURS	5,563	269.2	6,003	298.2
SMP	4,806	331.8	5,214	370.2
Total	21,925	\$1,012.8	23,565	\$1,122.1
Total Actives - Tier 1 and Tier 2				
Traditional SURS	43,721	\$2,213.5	42,307	\$2,172.4
Portable SURS	17,993	1,138.8	17,599	1,129.8
SMP	11,348	827.3	11,382	846.8
Total	73,062	\$4,179.6	71,288	\$4,149.1

Values may not add due to rounding.

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

	June 30, 2016		June 30, 2017	
	Number	Earnings	Number	Earnings
Active Members				
Part time				
Total Actives - Tier 1				
Traditional SURS	1,309	\$9.0	1,115	\$7.2
Portable SURS	240	1.8	216	1.6
SMP	146	1.0	118	0.9
Total	1,695	\$11.8	1,449	\$9.7
Total Actives - Tier 2				
Traditional SURS	2,565	\$19.4	2,490	\$18.7
Portable SURS	417	3.7	390	3.5
SMP	386	4.0	352	3.4
Total	3,368	\$27.0	3,232	\$25.7
Total Actives - Tier 1 and Tier 2				
Traditional SURS	3,874	\$28.3	3,605	\$25.9
Portable SURS	657	5.5	606	5.1
SMP	532	5.0	470	4.3
Total	5,063	\$38.8	4,681	\$35.4
Inactive Members				
Total Inactives - Tier 1				
Traditional SURS	59,746	\$37.8	59,090	\$35.0
Portable SURS	9,535	20.6	9,514	18.8
SMP	7,368	60.2	7,361	63.0
Total	76,649	\$118.6	75,965	\$116.8
Total Inactives - Tier 2				
Traditional SURS	8,200	\$22.4	10,155	\$22.4
Portable SURS	2,014	12.5	2,557	13.2
SMP	1,673	17.5	2,142	21.8
Total	11,887	\$52.4	14,854	\$57.4
Total Inactives - Tier 1 and Tier 2				
Traditional SURS	67,946	\$60.2	69,245	\$57.4
Portable SURS	11,549	33.0	12,071	32.0
SMP	9,041	77.7	9,503	84.8
Total	88,536	\$171.0	90,819	\$174.2

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, 2017

Age	Years of Service									Totals
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30 & Over		
Under 20	7	3	-	-	-	-	-	-	-	10
	\$ 56,773	\$ 80,684	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 137,457
20-24	293	605	13	-	-	-	-	-	-	911
	\$ 2,683,440	\$ 16,096,929	\$ 293,733	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 19,074,102
25-29	547	3,304	558	12	-	-	-	-	-	4,421
	\$ 6,800,420	\$ 130,269,425	\$ 23,057,281	\$ 530,008	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 160,657,134
30-34	495	3,935	2,378	536	17	-	-	-	-	7,361
	\$ 7,660,017	\$ 192,180,088	\$ 120,733,519	\$ 27,208,118	\$ 761,544	\$ -	\$ -	\$ -	\$ -	\$ 348,543,286
35-39	341	3,127	2,848	1,685	512	7	-	-	1	8,521
	\$ 5,767,852	\$ 166,210,466	\$ 164,454,118	\$ 102,004,600	\$ 30,949,496	\$ 445,967	\$ -	\$ -	\$ 44,372	\$ 469,876,872
40-44	239	2,191	2,348	2,072	1,419	306	15	-	-	8,590
	\$ 4,225,986	\$ 113,706,685	\$ 145,484,591	\$ 143,919,027	\$ 97,880,665	\$ 20,086,076	\$ 1,034,144	\$ -	\$ -	\$ 526,337,175
45-49	200	1,886	2,117	2,163	1,827	1,035	341	13	-	9,582
	\$ 3,351,398	\$ 92,598,852	\$ 121,438,778	\$ 149,525,033	\$ 138,864,961	\$ 78,946,180	\$ 23,157,970	\$ 1,041,392	\$ -	\$ 608,924,563
50-54	199	1,577	1,972	1,901	2,022	1,272	937	215	-	10,095
	\$ 3,093,749	\$ 77,141,407	\$ 100,213,309	\$ 119,970,755	\$ 150,697,589	\$ 101,895,747	\$ 74,372,950	\$ 15,739,481	\$ -	\$ 643,124,987
55-59	172	1,349	1,688	1,736	1,934	1,296	992	429	-	9,596
	\$ 2,765,970	\$ 62,068,019	\$ 85,553,910	\$ 102,492,107	\$ 132,734,457	\$ 105,828,898	\$ 91,353,147	\$ 38,871,355	\$ -	\$ 621,667,863
60-64	74	896	1,333	1,371	1,405	889	825	400	-	7,193
	\$ 1,301,596	\$ 38,763,712	\$ 62,304,964	\$ 78,130,437	\$ 91,372,751	\$ 66,865,553	\$ 72,286,182	\$ 46,685,535	\$ -	\$ 457,710,731
65 & Over	22	482	919	1,057	955	664	502	407	-	5,008
	\$ 304,693	\$ 16,440,678	\$ 32,855,569	\$ 52,065,861	\$ 60,074,603	\$ 43,272,321	\$ 36,531,231	\$ 51,487,033	\$ -	\$ 293,031,991
Total Count	2,589	19,355	16,174	12,533	10,091	5,469	3,612	1,465	-	71,288
Total Payroll	\$ 38,011,894	\$ 905,556,947	\$ 856,389,771	\$ 775,845,947	\$ 703,336,067	\$ 417,340,743	\$ 298,735,624	\$ 153,869,168	\$ -	\$ 4,149,086,161

Table 5
Distribution of Benefit Recipients by Age
as of June 30, 2017

<u>Age</u>	<u>Number</u>	<u>Annual Benefit</u>
Retirees and Survivors		
Under 50	440	\$ 3,783,210
50-54	493	18,512,370
55-59	3,734	129,749,212
60-64	9,233	323,439,992
65-69	13,877	491,950,057
70-74	13,018	506,501,057
75-79	9,315	377,895,667
80-84	6,411	243,622,672
85-89	4,291	148,451,747
90 & Over	2,704	75,321,313
Total	63,516	\$ 2,319,227,297
Disabilitants		
Under 50	139	\$ 2,992,383
50-54	134	3,157,291
55-59	218	4,630,550
60-64	230	5,213,248
65-69	172	3,531,220
70-74	63	1,168,774
75-79	45	958,203
80-84	15	193,831
85-89	12	163,551
90 & Over	1	12,279
Total	1,029	\$ 22,021,330

APPENDIX C

ACTUARIAL DETERMINATIONS

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Table 6
Summary of Actuarial Values
as of June 30, 2017
(\$ in Millions)

	Actuarial Present Value of Projected Benefits (APV)	Projected Unit Credit Values		Gross NC % of Pay ¹
		Actuarial Accrued Liability (AAL)	Gross Normal Cost (NC) ¹	
1. Active Members				
a. Retirement	\$14,026.5	\$ 9,355.2	\$521.6	15.09%
b. Death	228.3	149.9	9.4	0.27%
c. Disability	433.1	268.0	25.5	0.74%
d. Termination	1,905.7	1,204.2	129.5	3.75%
Total - Active Members	\$16,593.6	\$ 10,977.3	\$686.0	19.84%
2. Benefit Recipients				
a. Retirement	\$26,493.6	\$26,493.6	\$ 0.0	
b. Survivor	1,468.7	1,468.7	0.0	
c. Disability	263.6	263.6	0.0	
Total - Benefit Recipients	\$28,226.0	\$28,226.0	\$ 0.0	
3. Other Inactive	\$ 2,650.1	\$ 2,650.1		
4. Grand Total	\$47,469.6	\$41,853.4	\$686.0	19.84%
5. Operating Expense			\$ 15.9	0.46%
6. Total Normal Cost ²			\$701.9	20.30%
7. Expected Pay During Fiscal Year 2018 for Defined Benefit Plans ¹				\$ 3,457.4
8. Present Value of Future Salaries (PVFS) ¹				\$ 26,858.8

¹ For members currently active as of June 30, 2017, 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 23.46% for Tier 1 members and 10.70% for Tier 2 members.

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, 2017

	2016	2017	2018	2019	2020	2021
Beginning of Year:						
(1) Market Value of Assets	\$ 17,462,967,856	\$ 17,005,629,973				
(2) Actuarial Value of Assets	17,104,606,665	17,701,645,933				
End of Year:						
(3) Market Value of Assets	17,005,629,973	18,457,552,590				
(4) Net of Contributions and Disbursements	(474,381,562)	(515,120,429)				
(5) Total Investment Income						
= (3)-(1)-(4)	17,043,679	1,967,043,046				
(6) Projected Rate of Return	7.25%	7.25%				
(7) Projected Investment Income						
= (1)x(6)+[(1+(6)) ⁵ -1]x(4)	1,249,169,710	1,214,561,768				
(8) Investment Income in Excess of Projected Income	(1,232,126,031)	752,481,278				
(9) Excess Investment Income Recognized						
This Year (5 year recognition)						
(9a) From This Year	(246,425,206)	150,496,256				
(9b) From One Year Ago	(148,460,161)	(246,425,206)	\$ 150,496,256			
(9c) From Two Years Ago	302,890,656	(148,460,161)	(246,425,206)	\$ 150,496,256		
(9d) From Three Years Ago	129,284,034	302,890,656	(148,460,161)	(246,425,206)	\$ 150,496,256	
(9e) From Four Years Ago	(215,038,203)	129,284,035	302,890,655	(148,460,159)	(246,425,207)	\$ 150,496,254
(9f) Total Recognized Investment Gain/(Loss)	(177,748,880)	187,785,580	58,501,544	(244,389,109)	(95,928,951)	150,496,254
(10) Change in Actuarial Value of Assets						
= (4)+(7)+(9f)	597,039,268	887,226,919				
End of Year:						
(3) Market Value of Assets	17,005,629,973	18,457,552,590				
(11) Final Actuarial Value of Assets	17,701,645,933	18,588,872,852				
(12) Difference Between Market & Actuarial Values	(696,015,960)	(131,320,262)				
(13) Actuarial Value Rate of Return	6.35 %	8.04 %				
(14) Estimated Market Value Rate of Return	0.10 %	11.74 %				
(15) Ratio of Actuarial Value to Market Value	104 %	101 %				
(16) SURS Reported Market Value Rate of Return	0.22 %	12.20 %				

Table 8
Analysis of Change in
Actuarial Accrued Liability and Actuarial Value of Assets
for the Year Ending June 30, 2017
(\$ in Millions)

1. Actuarial (Gain)/Loss on Actuarial Accrued Liability ("AAL")		
(a) AAL 6/30/2016		\$ 40,923.3
(b) Normal Cost FY 2017	\$ 719.2	
(c) Benefits and Admin Expenses Paid FY 2017	(2,444.3)	
(d) Interest on (a), (b), and (c) at 7.25%	2,905.5	
(e) Expected AAL 6/30/2017 (a+b+c+d)		42,103.7
(f) Actual AAL 6/30/2017 Before Assumption and Method Changes		<u>41,853.4</u>
(g) Actuarial (Gain)/Loss on AAL (f-e)		\$ (250.3)
(h) Impact of Benefit Changes		0.0
(i) Impact of Change in Actuarial Assumptions and Methods		<u>0.0</u>
(j) Actual AAL After Changes (f+h+i)		\$ 41,853.4
2. Actuarial (Gain)/Loss on Assets		
(a) Actuarial Value of Assets 6/30/2016		\$ 17,701.6
(b) Contributions FY 2017	1,929.2	
(c) Benefits and Administrative Expenses	(2,444.3)	
(d) Interest on (a), (b), and (c) at 7.25%	1,265.0	
(e) Expected Assets 6/30/2017 (a+b+c+d)		\$ 18,451.5
(f) Actual Actuarial Value of Assets 6/30/2017		<u>18,588.9</u>
(g) Actuarial (Gain)/Loss on Assets (e-f)		\$ (137.4)
3. Total Actuarial (Gain)/Loss		
(a) (Gain)/Loss on AAL		\$ (250.3)
(b) (Gain)/Loss on Assets		<u>(137.4)</u>
(c) Net (Gain)/Loss (a+b)		\$ (387.7)

Values may not add due to rounding.

Table 9
Analysis of Change in
Unfunded Actuarial Accrued Liability
for the Year Ending June 30, 2017
(\$ in Millions)

1. Unfunded Actuarial Accrued Liability (UAAL) at 06/30/2016	\$		23,221.7
2. Contributions			
a. Contributions equal to normal cost plus interest on UAAL			
i Interest on 1)	\$		1,683.6
ii Member contributions			278.6
iii Employer/State normal cost			440.6
iv Interest on ii and iii			25.6
v Total due	\$		2,428.4
b. Contributions paid based on funding policy			
i Member contributions	\$		278.6
ii Employer/State contributions			1,650.6
iii Interest on i and ii			68.7
iv Total paid	\$		1,997.9
c. Expected increase in UAAL (2a.v-2b.iv)			
			430.5
3. Expected UAAL at 06/30/2017 (1+2c)			23,652.2
4. (Gains)/Losses			
a. Investment income	\$		(137.4)
b. Salary increases			(144.7)
c. Demographic and other			(105.6)
d. Total	\$		(387.7)
5. Plan Provision Changes			-
6. Assumption Changes			-
7. Total Change in UAAL (2c + 4d + 5 + 6)			42.8
8. UAAL at 06/30/2017 (1 + 7)	\$		23,264.5

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

	Amount of (Gain) or Loss			
	FY 2014	FY 2015	FY 2016	FY 2017
Investment Return ¹	\$ (802.4)	\$ (558.1)	\$ 151.8	\$ (137.4)
Salary Increase	(94.3)	(45.3)	(135.0)	(144.7)
Age and Service Retirement	105.2	(17.0)	59.3	(26.0)
General Employment Termination	21.2	8.0	5.7	10.7
Disability Incidence	(8.3)	(3.4)	3.0	0.3
In Service Mortality	1.7	1.4	(3.7)	(7.3)
Benefit Recipient ²	1.4	(2.0)	68.2	14.2
New Entrants	79.0	82.9	63.2	84.1
Data Refinements ³	NA	NA	NA	(152.9)
Other ⁴	(47.2)	(68.8)	129.5	(28.7)
Total Actuarial (Gain)/Loss	\$ (743.7)	\$ (602.3)	\$ 342.0	\$ (387.7)
BOY Actuarial Accrued Liability (AAL)	\$ 34,373.1	\$ 37,429.5	\$ 39,520.7	\$ 40,923.3
(Gain)/Loss as a % of BOY AAL	(2.2)%	(1.6)%	0.9%	(0.9)%
Total Non-Investment (Gain)/Loss	\$ 58.7	\$ (44.2)	\$ 190.2	\$ (250.3)
(Gain)/Loss as a % of BOY AAL	0.2%	(0.1)%	0.5%	(0.6)%

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

²Benefit 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 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 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.

³In 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).

⁴Includes 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	18,588.873	41,853.348	23,264.475	44.41	719.225	278.643	1,248.309	1,688.891	1,424.261	1,864.843	2,000.044
2018						701.871	283.668	1,250.610	1,668.813	1,443.249	1,861.451	1,996.407

¹ Defined Benefit Plan payroll is rolled forward with one year of salary scale at 3.75% and uses capped payroll for members hired on and after January 1, 2011.

² Projected for FY 2018 and actual for years prior.

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.

⁴ GRS recommends a 30-year (or shorter) closed amortization period beginning with fiscal year 2015, 27 years remaining at fiscal year 2018. (The statutory contribution would apply to fiscal year 2019; therefore a one year interest adjustment was applied). The amortization payment was calculated as a level percentage of pensionable (capped) payroll.

APPENDIX D

ACTUARIAL PROJECTIONS

DRAFT

Table 12
Baseline Projections – Actuarial Valuation June 30, 2017
Assumes Contributions based on Table 14 & Investment Return of 7.25% 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	Debt Service	Maximum Contribution ³	SURS Contribution % of Total Payroll
2017	\$ 4,184.468	\$ 851.148	\$ 3,333.320	\$ 1,650.551	\$ 278.643	\$ 2,429.467	\$ 14.847	\$ 18,588.873	\$ 41,853.348	44.41 %	\$ 116.476	\$ 1,676.841	39.44%
2018	4,454.422	912.995	3,541.427	1,615.482	283.668	2,551.407	15.851	19,293.644	42,955.892	44.92	120.304	1,633.839	36.27%
2019	4,593.492	949.493	3,643.999	1,641.115	291.884	2,648.668	16.445	19,676.093	44,029.403	44.69	123.920	1,661.075	35.73%
2020	4,751.481	991.341	3,760.140	1,723.932	289.251	2,762.351	17.062	20,217.116	45,056.818	44.87	132.009	1,741.546	36.28%
2021	4,889.367	1,027.720	3,861.648	1,806.165	293.897	2,870.256	17.702	21,028.307	46,042.319	45.67	139.615	1,816.087	36.94%
2022	5,014.848	1,060.431	3,954.417	1,859.961	298.126	2,989.240	18.366	21,673.083	46,968.745	46.14	146.736	1,864.781	37.09%
2023	5,142.983	1,093.822	4,049.161	1,894.101	302.576	3,107.106	19.054	22,281.794	47,833.330	46.58	153.373	1,899.282	36.83%
2024	5,277.183	1,127.357	4,149.826	1,941.798	307.482	3,222.198	19.769	22,869.182	48,635.724	47.02	164.417	1,941.798	36.80%
2025	5,424.259	1,162.532	4,261.727	1,990.313	313.184	3,333.007	20.510	23,439.780	49,377.676	47.47	174.604	1,990.313	36.69%
2026	5,575.960	1,197.217	4,378.743	2,046.314	319.290	3,446.762	21.280	23,997.462	50,052.052	47.95	179.149	2,046.314	36.70%
2027	5,732.908	1,232.587	4,500.321	2,104.908	325.734	3,561.956	22.077	24,542.808	50,653.582	48.45	183.195	2,104.908	36.72%
2028	5,897.532	1,269.157	4,628.375	2,162.173	332.663	3,669.057	22.905	25,082.400	51,186.570	49.00	191.634	2,162.173	36.66%
2029	6,072.968	1,307.347	4,765.621	2,224.502	340.226	3,769.555	23.764	25,628.525	51,654.174	49.62	199.325	2,224.502	36.63%
2030	6,253.908	1,346.260	4,907.647	2,284.883	348.105	3,872.134	24.656	26,177.780	52,049.401	50.29	211.160	2,284.883	36.54%
2031	6,441.469	1,386.993	5,054.476	2,348.905	356.302	3,972.695	25.580	26,736.547	52,369.229	51.05	221.997	2,348.905	36.47%
2032	6,637.915	1,431.325	5,206.591	2,422.364	364.851	4,068.465	26.539	27,320.579	52,613.528	51.93	226.944	2,422.364	36.49%
2033	6,847.230	1,478.962	5,368.268	2,506.600	374.083	4,091.465	27.535	28,018.901	52,853.482	53.01	226.249	2,506.600	36.61%
2034	7,066.106	1,529.225	5,536.881	2,602.364	383.803	4,167.808	28.567	28,796.960	53,034.662	54.30	NA	2,820.206	36.83%
2035	7,293.830	1,581.495	5,712.336	2,686.232	393.990	4,238.226	29.638	29,654.799	53,159.773	55.78	NA	2,911.095	36.83%
2036	7,530.308	1,635.217	5,895.091	2,773.324	404.672	4,302.891	30.750	30,607.968	53,231.401	57.50	NA	3,005.477	36.83%
2037	7,777.738	1,691.750	6,085.988	2,864.450	415.893	4,360.387	31.903	31,675.496	53,253.899	59.48	NA	3,104.231	36.83%
2038	8,036.393	1,751.422	6,284.971	2,959.710	427.674	4,413.175	33.099	32,875.366	53,229.474	61.76	NA	3,207.464	36.83%
2039	8,306.439	1,813.410	6,493.030	3,059.164	440.106	4,456.412	34.341	34,232.036	53,166.294	64.39	NA	3,315.245	36.83%
2040	8,588.491	1,877.563	6,710.929	3,163.041	453.248	4,488.795	35.628	35,773.380	53,074.978	67.40	NA	3,427.816	36.83%
2041	8,885.309	1,944.235	6,941.074	3,272.355	467.319	4,510.204	36.964	37,530.696	52,968.151	70.86	NA	3,546.282	36.83%
2042	9,193.862	2,012.564	7,181.299	3,385.992	482.133	4,518.353	38.351	39,538.569	52,861.849	74.80	NA	3,669.430	36.83%
2043	9,514.385	2,083.330	7,431.055	3,504.037	497.624	4,518.507	39.789	41,828.656	52,767.112	79.27	NA	3,797.357	36.83%
2044	9,845.502	2,155.939	7,689.563	3,625.983	513.703	4,510.554	41.281	44,434.406	52,695.313	84.32	NA	3,929.511	36.83%
2045	10,189.396	2,231.761	7,957.635	3,752.635	530.429	4,494.751	42.829	47,392.320	52,658.154	90.00	NA	4,066.765	36.83%

¹ Payroll shown is pensionable pay. It 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 Excludes SMP contributions. Includes employer contributions.

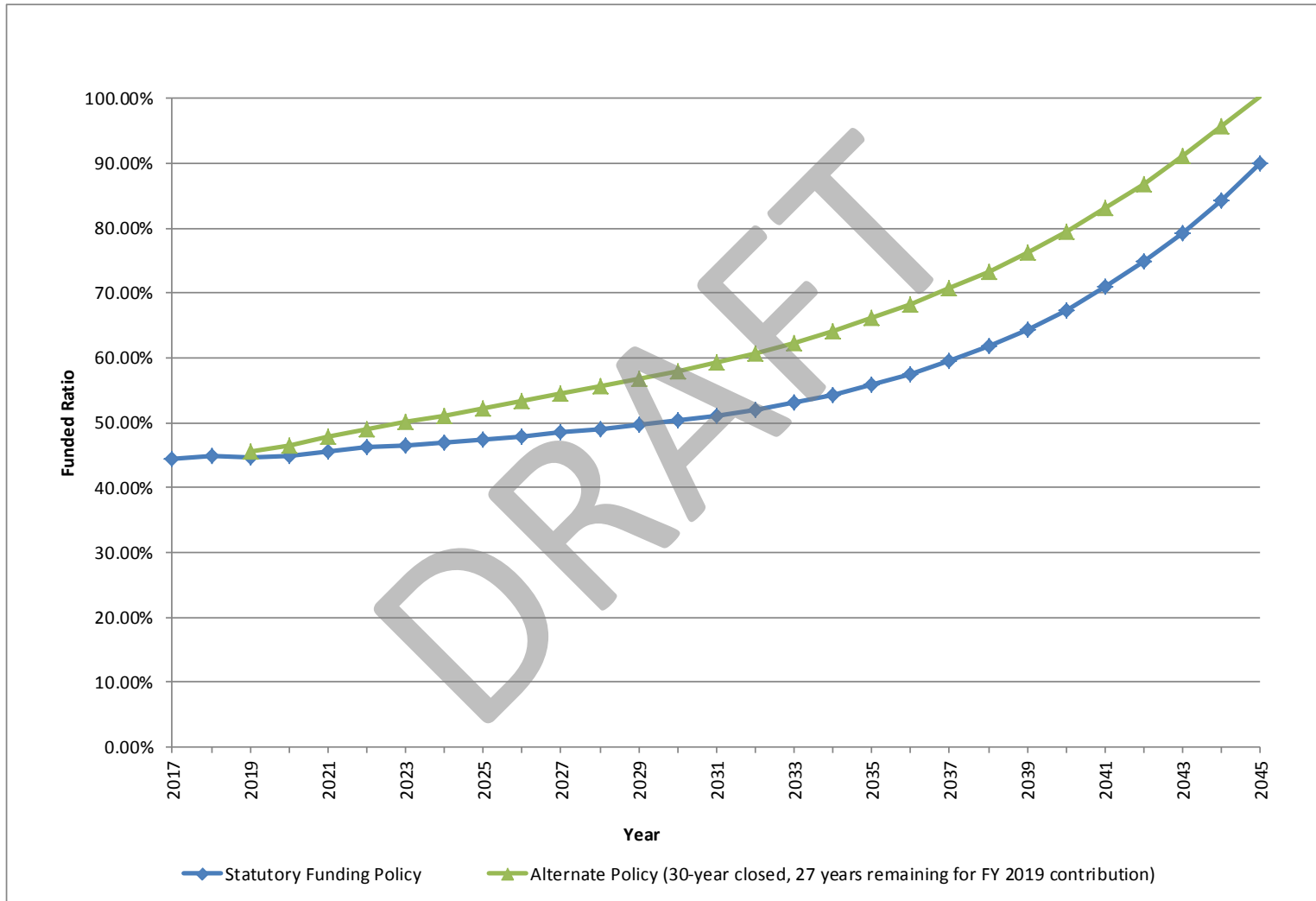
³ Maximum contribution after impact of debt service.

Graph 1

Projected Funded Ratio Based on Statutory Contributions

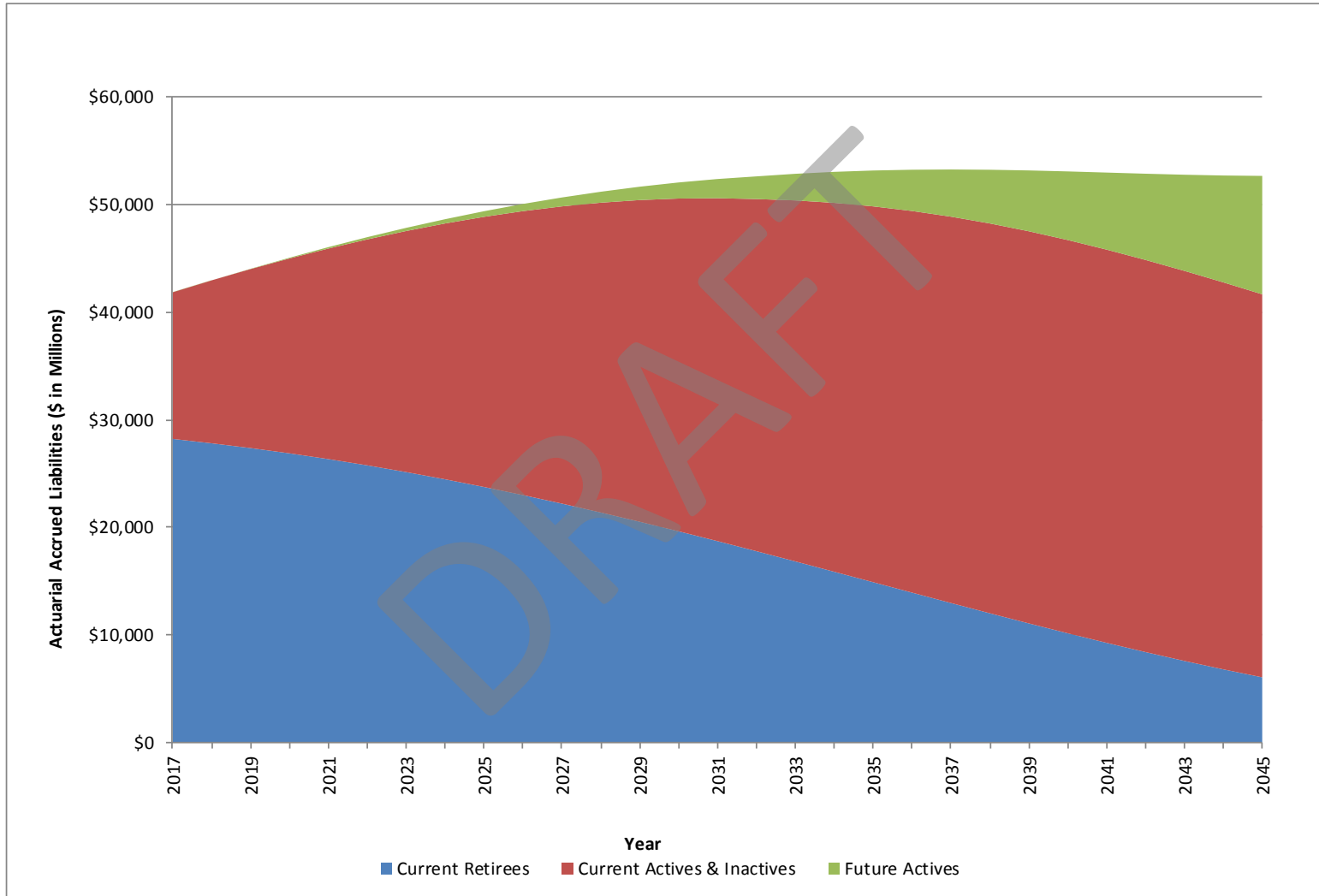
Actuarial Valuation as of June 30, 2017

(\$ in Millions)



Graph 2

Projected Actuarial Accrued Liabilities Actuarial Valuation as of June 30, 2017 (\$ in Millions)



Graph 3 Projected Benefit Payments Actuarial Valuation as of June 30, 2017 (\$ in Millions)

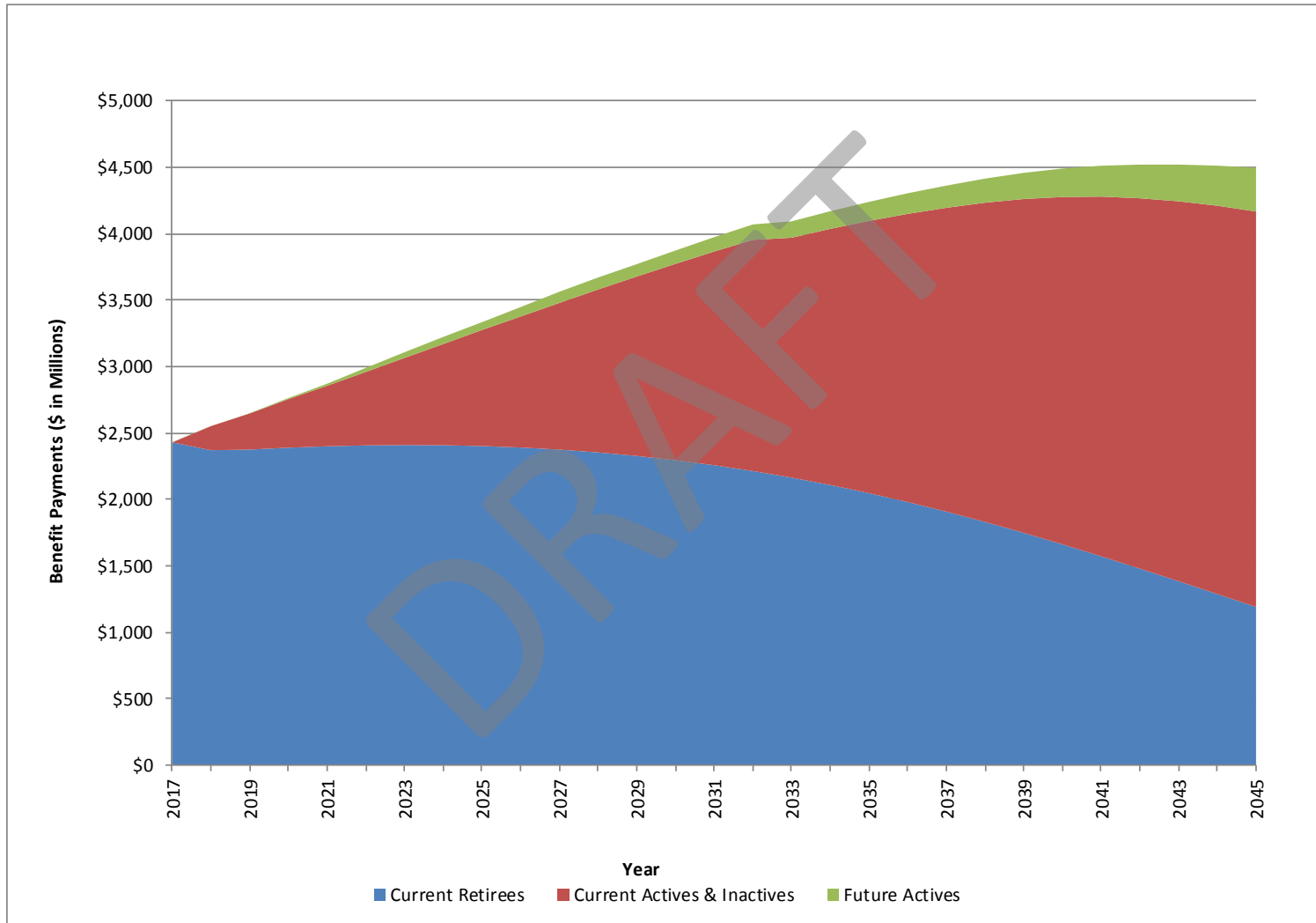


Table 13
Projected Statutory Contributions for the Actuarial Valuation as of June 30, 2017, before
Impact of Bonds Issued in 2004
(\$ in Millions)

FYE	60% of New Members to OHP, 20% to Tier 2, 20% to SMP			
	SURS Cont.	SMP Cont.	Combined State and Employer Contribution	
			\$	% of Pay ¹
2018 ²	\$ 1,754.143	\$ 64.582	\$ 1,818.725	40.83 %
2019	1,784.995	64.574	1,849.569	40.26
2020	1,873.555	70.159	1,943.714	40.91
2021	1,955.702	72.729	2,028.431	41.49
2022	2,011.517	75.042	2,086.559	41.61
2023	2,052.654	77.403	2,130.057	41.42
2024	2,106.216	79.774	2,185.990	41.42
2025	2,164.916	82.262	2,247.178	41.43
2026	2,225.463	84.715	2,310.178	41.43
2027	2,288.103	87.216	2,375.319	41.43
2028	2,353.808	89.803	2,443.611	41.43
2029	2,423.827	92.503	2,516.330	41.43
2030	2,496.043	95.255	2,591.298	41.43
2031	2,570.902	98.136	2,669.038	41.44
2032	2,649.308	101.270	2,750.578	41.44
2033	2,732.849	104.636	2,837.485	41.44
2034	2,820.206	108.188	2,928.394	41.44
2035	2,911.095	111.882	3,022.977	41.45
2036	3,005.477	115.678	3,121.155	41.45
2037	3,104.231	119.672	3,223.903	41.45
2038	3,207.464	123.887	3,331.351	41.45
2039	3,315.245	128.266	3,443.511	41.46
2040	3,427.816	132.797	3,560.613	41.46
2041	3,546.282	137.506	3,683.788	41.46
2042	3,669.430	142.333	3,811.763	41.46
2043	3,797.357	147.331	3,944.688	41.46
2044	3,929.511	152.459	4,081.970	41.46
2045	4,066.765	157.814	4,224.579	41.46
Total	\$76,244.880	\$2,917.872	\$79,162.752	

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.

²Total fiscal Year 2018 contribution amount as determined in the recertification calculation based on the actuarial valuation as of June 30, 2016.

Table 14
Projected Statutory Contributions for the Actuarial Valuation as of June 30, 2017
Including Impact of Bonds Issued in 2004
(\$ in Millions)

FYE	60% of New Members to OHP, 20% to Tier 2, 20% to SMP										
			Combined State and Employer Contribution		Debt Service		SURS Alternate Policy Contribution ²		Projected % of Alternate Policy Contributed ³	Employer Normal Cost Contribution	State Contribution
	SURS Cont.	SMP Cont.	\$	% of Pay ¹	\$	% of Pay ¹	SURS Cont.	Total (w/SMP)			
2018 ⁴	\$ 1,615.482	\$ 64.582	\$ 1,680.064	37.72 %	\$ 120.304	2.70 %	\$ 1,615.482	\$ 1,680.064		\$ 4.256	\$ 1,675.808
2019	1,641.115	64.574	1,705.689	37.13	123.920	2.70	1,996.407	2,060.981	82.76 %	4.146	1,701.543
2020	1,723.932	70.159	1,794.091	37.76	132.009	2.78	2,013.480	2,083.639	86.10	6.274	1,787.817
2021	1,806.165	72.729	1,878.894	38.43	139.615	2.86	2,066.000	2,138.729	87.85	5.954	1,872.940
2022	1,859.961	75.042	1,935.003	38.59	146.736	2.93	2,101.654	2,176.696	88.90	25.214	1,909.789
2023	1,894.101	77.403	1,971.504	38.33	153.373	2.98	2,116.564	2,193.967	89.86	30.702	1,940.802
2024	1,941.798	79.774	2,021.572	38.31	164.417	3.12	2,144.601	2,224.375	90.88	36.199	1,985.373
2025	1,990.313	82.262	2,072.575	38.21	174.604	3.22	2,174.446	2,256.708	91.84	41.868	2,030.707
2026	2,046.314	84.715	2,131.029	38.22	179.149	3.21	2,208.106	2,292.821	92.94	47.619	2,083.410
2027	2,104.908	87.216	2,192.124	38.24	183.195	3.20	2,242.573	2,329.789	94.09	53.820	2,138.304
2028	2,162.173	89.803	2,251.976	38.19	191.634	3.25	2,278.745	2,368.548	95.08	60.413	2,191.563
2029	2,224.502	92.503	2,317.005	38.15	199.325	3.28	2,316.551	2,409.054	96.18	67.362	2,249.643
2030	2,284.883	95.255	2,380.138	38.06	211.160	3.38	2,355.911	2,451.166	97.10	74.481	2,305.657
2031	2,348.905	98.136	2,447.041	37.99	221.997	3.45	2,398.120	2,496.256	98.03	82.064	2,364.977
2032	2,422.364	101.270	2,523.634	38.02	226.944	3.42	2,441.683	2,542.953	99.24	90.065	2,433.569
2033	2,506.600	104.636	2,611.236	38.14	226.249	3.30	2,486.701	2,591.337	100.77	98.449	2,512.787
2034	2,602.364	108.188	2,710.552	38.36			2,533.129	2,641.317	102.62	107.154	2,603.398
2035	2,686.232	111.882	2,798.114	38.36			2,580.229	2,692.111	103.94	116.301	2,681.813
2036	2,773.324	115.678	2,889.002	38.36			2,628.314	2,743.992	105.28	125.907	2,763.095
2037	2,864.450	119.672	2,984.122	38.37			2,676.088	2,795.760	106.74	135.989	2,848.133
2038	2,959.710	123.887	3,083.597	38.37			2,723.030	2,846.917	108.31	146.475	2,937.122
2039	3,059.164	128.266	3,187.430	38.37			2,768.380	2,896.646	110.04	157.466	3,029.964
2040	3,163.041	132.797	3,295.838	38.38			2,811.605	2,944.402	111.94	168.930	3,126.908
2041	3,272.355	137.506	3,409.861	38.38			2,851.188	2,988.694	114.09	180.827	3,229.034
2042	3,385.992	142.333	3,528.325	38.38			2,886.900	3,029.233	116.48	193.110	3,335.215
2043	3,504.037	147.331	3,651.368	38.38			2,908.692	3,056.023	119.48	205.759	3,445.609
2044	3,625.983	152.459	3,778.442	38.38			2,897.667	3,050.126	123.88	218.770	3,559.672
2045	3,752.635	157.814	3,910.449	38.38			2,782.236	2,940.050	133.01	232.122	3,678.327
Total	\$ 70,222.803	\$ 2,917.872	\$ 73,140.675		\$ 2,794.630		\$ 68,004.482	\$ 70,922.354		\$ 2,717.698	\$ 70,422.977

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.

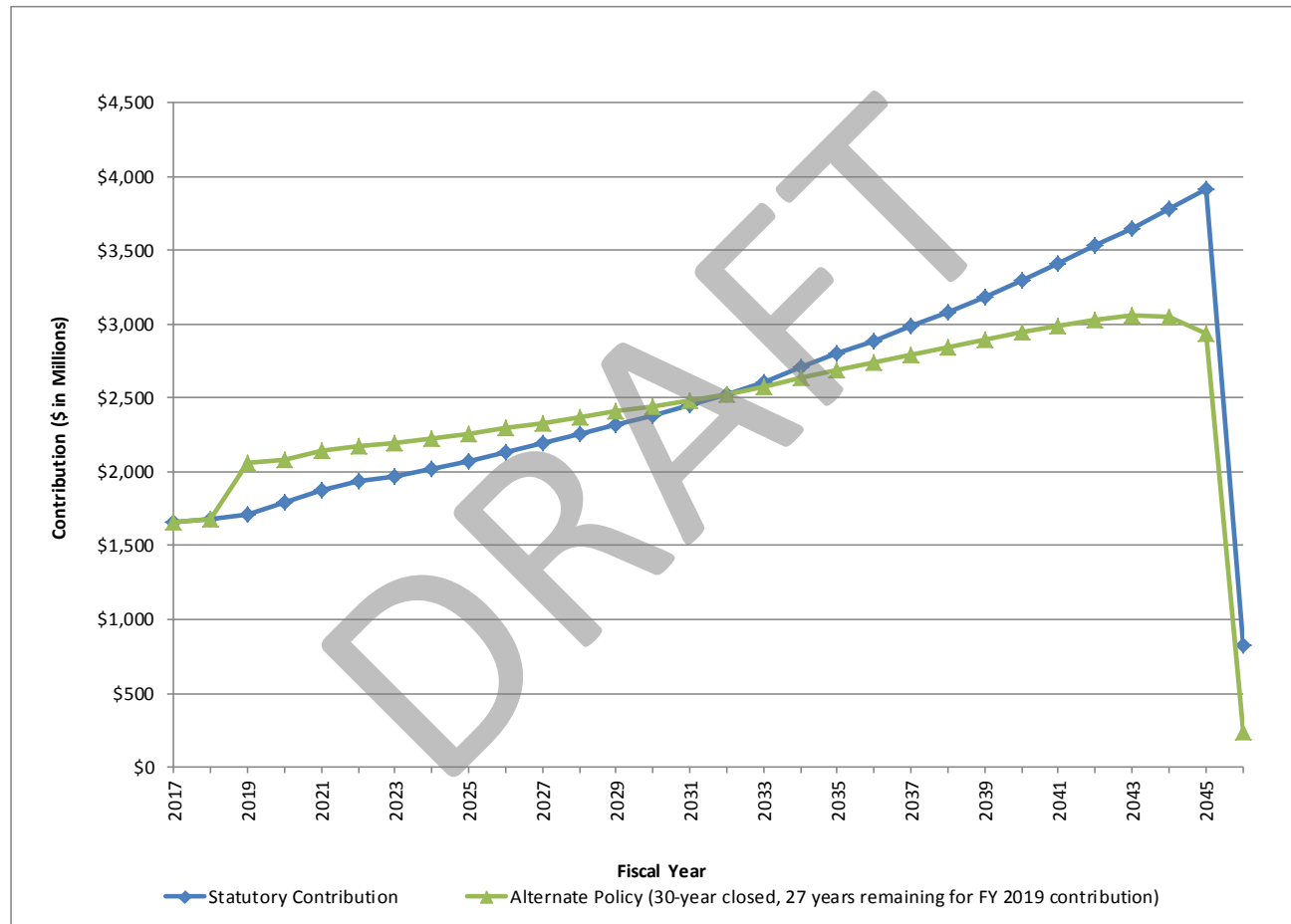
² Alternate funding policy of normal cost plus 30-year closed period amortization of the unfunded liability as a level percentage of capped payroll beginning in FY 2016 with 27 years remaining as of FY 2019. Statutory Contribution is shown for FY 2018 for the Alternate funding policy contribution.

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).

⁴ Total fiscal Year 2018 contribution amount as determined in the recertification calculation based on the actuarial valuation as of June 30, 2016.

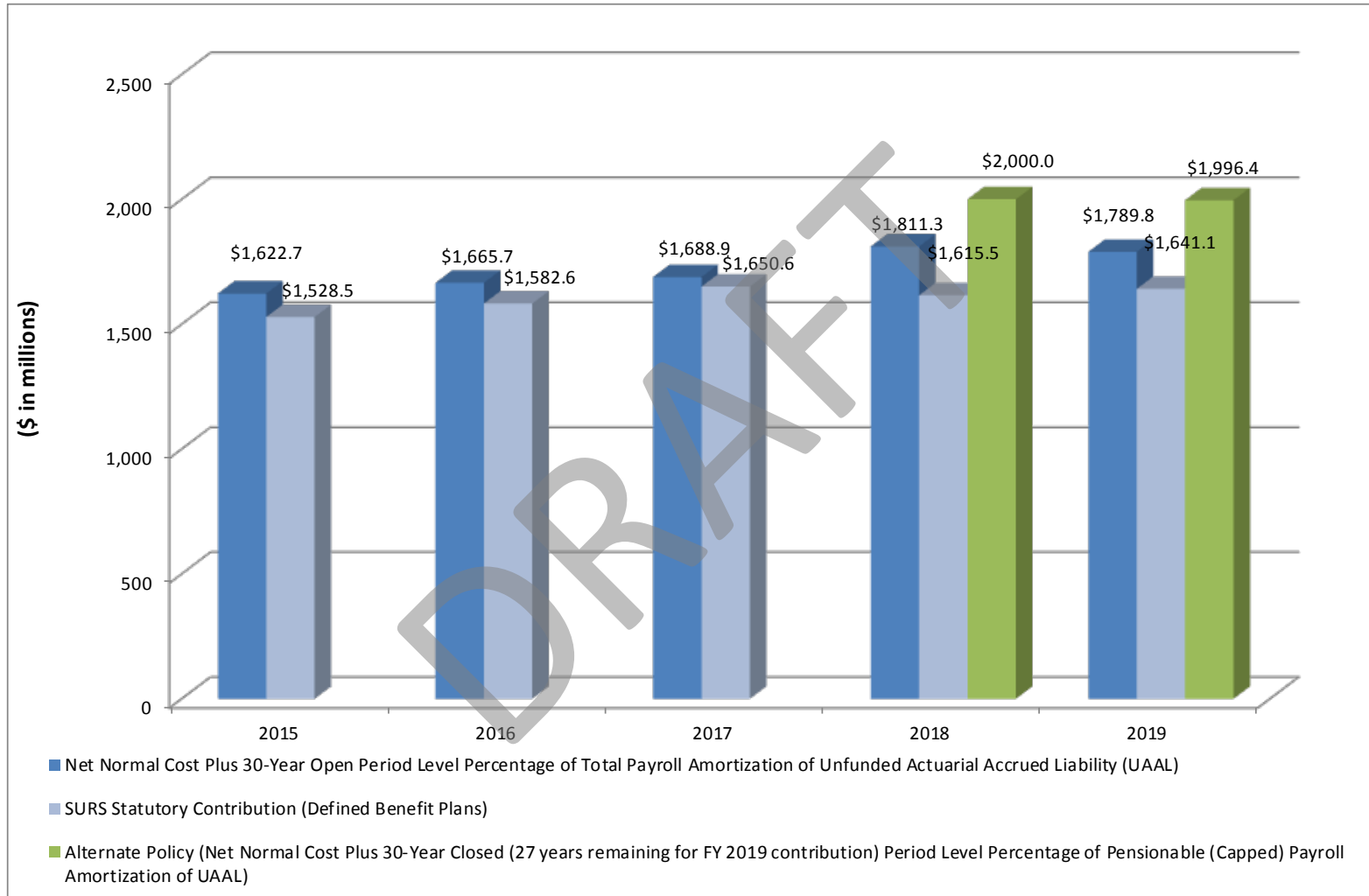
Graph 4

Projected Statutory Contributions vs. Contributions under Alternate Policy (Normal Cost Plus 30-year Closed Period Level Percent of Pay Amortization) (27 years remaining in Amortization Period for FY 2019 Contribution) (\$ in Millions)



Alternate funding policy of normal cost plus 30-year closed period amortization of the unfunded liability as a level percentage of capped payroll beginning in FY 2016 and 27 years remaining in FY 2019. 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.

Graph 5 Statutory Contributions vs. Net Normal Cost Plus Level Percentage of Payroll Amortization of Unfunded Liability and Alternate Policy (\$ in Millions)



Amounts prior to fiscal year 2016 are based on the Annual Required Contribution (“ARC”). Beginning in fiscal year 2015, a contribution equal to normal cost plus 30-year closed period amortization of the unfunded liability as a level percentage of capped payroll is used. Amounts are projected for fiscal years 2018 and 2019. Consistent underfunding compared to the ARC is a primary cause of the current low funded status.

APPENDIX E

ADDITIONAL PROJECTION DETAILS

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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 7.25% 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	Debt Service	Maximum Contribution ³	SURS Contribution % of Total Payroll
2017	\$ 4,184.468	\$ 851.148	\$ 3,333.320	\$ 1,650.551	\$ 278.643	\$ 2,429.467	\$ 14.847	\$ 18,588.873	\$ 41,853.348	44.41 %	\$ 116.476	\$ 1,676.841	39.44 %
2018	4,454.422	912.995	3,541.427	1,615.482	283.668	2,551.407	15.851	19,244.663	42,955.892	44.80	120.304	1,633.839	36.27
2019	4,593.492	949.493	3,643.999	1,641.115	291.884	2,648.668	16.445	19,881.712	44,029.403	45.16	123.920	1,661.075	35.73
2020	4,751.481	991.341	3,760.140	1,727.578	289.251	2,762.351	17.062	20,533.392	45,056.818	45.57	132.009	1,744.397	36.36
2021	4,889.367	1,027.720	3,861.648	1,789.953	293.897	2,870.256	17.702	21,189.316	46,042.319	46.02	139.615	1,803.485	36.61
2022	5,014.848	1,060.431	3,954.417	1,835.890	298.126	2,989.240	18.366	21,820.837	46,968.745	46.46	146.736	1,846.232	36.61
2023	5,142.983	1,093.822	4,049.161	1,882.799	302.576	3,107.106	19.054	22,428.556	47,833.330	46.89	153.373	1,890.518	36.61
2024	5,277.183	1,127.357	4,149.826	1,931.929	307.482	3,222.198	19.769	23,016.363	48,635.724	47.32	164.417	1,932.806	36.61
2025	5,424.259	1,162.532	4,261.727	1,981.069	313.184	3,333.007	20.510	23,588.059	49,377.676	47.77	174.604	1,981.069	36.52
2026	5,575.960	1,197.217	4,378.743	2,036.812	319.290	3,446.762	21.280	24,146.651	50,052.052	48.24	179.149	2,036.812	36.53
2027	5,732.908	1,232.587	4,500.321	2,095.139	325.734	3,561.956	22.077	24,692.696	50,653.582	48.75	183.195	2,095.139	36.55
2028	5,897.532	1,269.157	4,628.375	2,152.123	332.663	3,669.057	22.905	25,232.747	51,186.570	49.30	191.634	2,152.123	36.49
2029	6,072.968	1,307.347	4,765.621	2,214.153	340.226	3,769.555	23.764	25,779.055	51,654.174	49.91	199.325	2,214.153	36.46
2030	6,253.908	1,346.260	4,907.647	2,274.226	348.105	3,872.134	24.656	26,328.187	52,049.401	50.58	211.160	2,274.226	36.36
2031	6,441.469	1,386.993	5,054.476	2,337.928	356.302	3,972.695	25.580	26,886.490	52,369.229	51.34	221.997	2,337.928	36.29
2032	6,637.915	1,431.325	5,206.591	2,411.052	364.851	4,068.465	26.539	27,469.679	52,613.528	52.21	226.944	2,411.052	36.32
2033	6,847.230	1,478.962	5,368.268	2,494.932	374.083	4,091.465	27.535	28,166.726	52,853.482	53.29	226.249	2,494.932	36.44
2034	7,066.106	1,529.225	5,536.881	2,586.837	383.803	4,167.808	28.567	28,939.422	53,034.662	54.57	NA	2,808.165	36.61
2035	7,293.830	1,581.495	5,712.336	2,670.205	393.990	4,238.226	29.638	29,790.992	53,159.773	56.04	NA	2,898.665	36.61
2036	7,530.308	1,635.217	5,895.091	2,756.777	404.672	4,302.891	30.750	30,736.898	53,231.401	57.74	NA	2,992.645	36.61
2037	7,777.738	1,691.750	6,085.988	2,847.359	415.893	4,360.387	31.903	31,796.074	53,253.899	59.71	NA	3,090.977	36.61
2038	8,036.393	1,751.422	6,284.971	2,942.050	427.674	4,413.175	33.099	32,986.397	53,229.474	61.97	NA	3,193.770	36.61
2039	8,306.439	1,813.410	6,493.030	3,040.912	440.106	4,456.412	34.341	34,332.213	53,166.294	64.58	NA	3,301.090	36.61
2040	8,588.491	1,877.563	6,710.929	3,144.168	453.248	4,488.795	35.628	35,861.275	53,074.978	67.57	NA	3,413.181	36.61
2041	8,885.309	1,944.235	6,941.074	3,252.831	467.319	4,510.204	36.964	37,604.744	52,968.151	71.00	NA	3,531.140	36.61
2042	9,193.862	2,012.564	7,181.299	3,365.789	482.133	4,518.353	38.351	39,597.063	52,861.849	74.91	NA	3,653.763	36.61
2043	9,514.385	2,083.330	7,431.055	3,483.129	497.624	4,518.507	39.789	41,869.738	52,767.112	79.35	NA	3,781.143	36.61
2044	9,845.502	2,155.939	7,689.563	3,604.348	513.703	4,510.554	41.281	44,456.061	52,695.313	84.36	NA	3,912.734	36.61
2045	10,189.396	2,231.761	7,957.635	3,730.245	530.429	4,494.751	42.829	47,392.357	52,658.154	90.00	NA	4,049.402	36.61

¹ Payroll shown is pensionable pay. It 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 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, 2017
after Bonds (Valuation Basis) and before Bonds (Hypothetical Basis)

	After Bonds (Valuation Basis)	Before Bonds (Hypothetical)
1 Market Value at 6/30/2016	\$17,005,629,973	\$14,797,261,744
2a Employer and Non-Employer Contributing Entity Contributions	1,650,550,724	1,793,317,165
2b Member Contributions	278,642,830	278,642,830
2c Benefits and Expenses	2,444,313,983	2,444,313,983
2d Net Non-Investment Cash Flow	(515,120,429)	(372,353,988)
3 Investment Return (Based on Estimated Rate of 11.74%)	1,967,043,046	1,716,663,319
4 Expected Return (Based on Estimated Rate of 7.25%)	1,214,561,768	1,059,539,807
5 Market Value at 6/30/2017 (1+2d+3)	18,457,552,590	16,141,571,075
6 Expected Market Value at 6/30/2017 (1+2d+4)	17,705,071,312	15,484,447,563
7a Actuarial Gain/(Loss) Current Year	752,481,278	657,123,512
7b Actuarial Gain/(Loss) 1 Year Prior	(1,232,126,031)	(1,069,638,132)
7c Actuarial Gain/(Loss) 2 Years Prior	(742,300,803)	(641,546,753)
7d Actuarial Gain/(Loss) 3 Years Prior	1,514,453,279	1,303,474,812
7e Actuarial Gain/(Loss) 4 Years Prior	646,420,171	553,235,951
8 Actuarial Value at 6/30/2016	17,701,645,933	15,405,863,166
9 Actuarial Value at 6/30/2017 (8+2d+4+.2*(7a+7b+7c+7d+7e))	18,588,872,852	16,253,578,863

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	Debt Service	SURS Contribution % of Total Payroll
2017	\$ 4,184.468	\$ 851.148	\$ 3,333.320	\$ 1,793.317	\$ 278.643	\$ 2,429.467	\$ 14.847	\$ 16,253.579	\$ 41,853.348	38.83 %	NA	42.86 %
2018	4,454.422	912.995	3,541.427	1,754.143	283.668	2,551.407	15.851	16,925.422	42,955.892	39.40	NA	39.38
2019	4,593.492	949.493	3,643.999	1,784.995	291.884	2,648.668	16.445	17,320.781	44,029.403	39.34	NA	38.86
2020	4,751.481	991.341	3,760.140	1,873.555	289.251	2,762.351	17.062	17,859.013	45,056.818	39.64	NA	39.43
2021	4,889.367	1,027.720	3,861.648	1,955.702	293.897	2,870.256	17.702	18,633.649	46,042.319	40.47	NA	40.00
2022	5,014.848	1,060.431	3,954.417	2,011.517	298.126	2,989.240	18.366	19,261.767	46,968.745	41.01	NA	40.11
2023	5,142.983	1,093.822	4,049.161	2,052.654	302.576	3,107.106	19.054	19,859.858	47,833.330	41.52	NA	39.91
2024	5,277.183	1,127.357	4,149.826	2,106.216	307.482	3,222.198	19.769	20,441.929	48,635.724	42.03	NA	39.91
2025	5,424.259	1,162.532	4,261.727	2,164.916	313.184	3,333.007	20.510	21,017.373	49,377.676	42.56	NA	39.91
2026	5,575.960	1,197.217	4,378.743	2,225.463	319.290	3,446.762	21.280	21,584.959	50,052.052	43.13	NA	39.91
2027	5,732.908	1,232.587	4,500.321	2,288.103	325.734	3,561.956	22.077	22,145.119	50,653.582	43.72	NA	39.91
2028	5,897.532	1,269.157	4,628.375	2,353.808	332.663	3,669.057	22.905	22,709.338	51,186.570	44.37	NA	39.91
2029	6,072.968	1,307.347	4,765.621	2,423.827	340.226	3,769.555	23.764	23,289.840	51,654.174	45.09	NA	39.91
2030	6,253.908	1,346.260	4,907.647	2,496.043	348.105	3,872.134	24.656	23,888.222	52,049.401	45.90	NA	39.91
2031	6,441.469	1,386.993	5,054.476	2,570.902	356.302	3,972.695	25.580	24,510.899	52,369.229	46.80	NA	39.91
2032	6,637.915	1,431.325	5,206.591	2,649.308	364.851	4,068.465	26.539	25,168.598	52,613.528	47.84	NA	39.91
2033	6,847.230	1,478.962	5,368.268	2,732.849	374.083	4,091.465	27.535	25,945.208	52,853.482	49.09	NA	39.91
2034	7,066.106	1,529.225	5,536.881	2,820.206	383.803	4,167.808	28.567	26,798.525	53,034.662	50.53	NA	39.91
2035	7,293.830	1,581.495	5,712.336	2,911.095	393.990	4,238.226	29.638	27,744.348	53,159.773	52.19	NA	39.91
2036	7,530.308	1,635.217	5,895.091	3,005.477	404.672	4,302.891	30.750	28,799.431	53,231.401	54.10	NA	39.91
2037	7,777.738	1,691.750	6,085.988	3,104.231	415.893	4,360.387	31.903	29,984.160	53,253.899	56.30	NA	39.91
2038	8,036.393	1,751.422	6,284.971	3,207.464	427.674	4,413.175	33.099	31,317.987	53,229.474	58.84	NA	39.91
2039	8,306.439	1,813.410	6,493.030	3,315.245	440.106	4,456.412	34.341	32,826.948	53,166.294	61.74	NA	39.91
2040	8,588.491	1,877.563	6,710.929	3,427.816	453.248	4,488.795	35.628	34,540.628	53,074.978	65.08	NA	39.91
2041	8,885.309	1,944.235	6,941.074	3,546.282	467.319	4,510.204	36.964	36,492.253	52,968.151	68.89	NA	39.91
2042	9,193.862	2,012.564	7,181.299	3,669.430	482.133	4,518.353	38.351	38,718.371	52,861.849	73.24	NA	39.91
2043	9,514.385	2,083.330	7,431.055	3,797.357	497.624	4,518.507	39.789	41,252.760	52,767.112	78.18	NA	39.91
2044	9,845.502	2,155.939	7,689.563	3,929.511	513.703	4,510.554	41.281	44,131.096	52,695.313	83.75	NA	39.91
2045	10,189.396	2,231.761	7,957.635	4,066.765	530.429	4,494.751	42.829	47,392.339	52,658.154	90.00	NA	39.91

¹ Payroll shown is pensionable pay. It 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 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 7.25% Each Year on Actuarial Value of Assets
(\$ in Millions)**

Fiscal	Total	SMP	DB	SURS	Member	Assets				Funding	Debt	SURS Contribution
Year	Payroll ¹	Payroll	Payroll ¹	Contributions ²	Contributions	Benefits	Expenses	EOY	AAL	Ratio	Service	% of Total Payroll
Ending												
2017	\$ 4,184.468	\$ 851.148	\$ 3,333.320	\$ 1,793.317	\$ 278.643	\$ 2,429.467	\$ 14.847	\$ 16,253.579	\$ 41,853.348	38.83 %	NA	42.86 %
2018	4,454.422	912.995	3,541.427	1,754.143	283.668	2,551.407	15.851	16,883.660	42,955.892	39.30	NA	39.38
2019	4,593.492	949.493	3,643.999	1,784.995	291.884	2,648.668	16.445	17,498.540	44,029.403	39.74	NA	38.86
2020	4,751.481	991.341	3,760.140	1,876.406	289.251	2,762.351	17.062	18,131.569	45,056.818	40.24	NA	39.49
2021	4,889.367	1,027.720	3,861.648	1,943.100	293.897	2,870.256	17.702	18,771.962	46,042.319	40.77	NA	39.74
2022	5,014.848	1,060.431	3,954.417	1,992.968	298.126	2,989.240	18.366	19,390.897	46,968.745	41.28	NA	39.74
2023	5,142.983	1,093.822	4,049.161	2,043.890	302.576	3,107.106	19.054	19,989.273	47,833.330	41.79	NA	39.74
2024	5,277.183	1,127.357	4,149.826	2,097.223	307.482	3,222.198	19.769	20,571.414	48,635.724	42.30	NA	39.74
2025	5,424.259	1,162.532	4,261.727	2,155.673	313.184	3,333.007	20.510	21,146.673	49,377.676	42.83	NA	39.74
2026	5,575.960	1,197.217	4,378.743	2,215.961	319.290	3,446.762	21.280	21,713.793	50,052.052	43.38	NA	39.74
2027	5,732.908	1,232.587	4,500.321	2,278.334	325.734	3,561.956	22.077	22,273.176	50,653.582	43.97	NA	39.74
2028	5,897.532	1,269.157	4,628.375	2,343.758	332.663	3,669.057	22.905	22,836.271	51,186.570	44.61	NA	39.74
2029	6,072.968	1,307.347	4,765.621	2,413.479	340.226	3,769.555	23.764	23,415.259	51,654.174	45.33	NA	39.74
2030	6,253.908	1,346.260	4,907.647	2,485.386	348.105	3,872.134	24.656	24,011.697	52,049.401	46.13	NA	39.74
2031	6,441.469	1,386.993	5,054.476	2,559.925	356.302	3,972.695	25.580	24,631.958	52,369.229	47.04	NA	39.74
2032	6,637.915	1,431.325	5,206.591	2,637.996	364.851	4,068.465	26.539	25,286.720	52,613.528	48.06	NA	39.74
2033	6,847.230	1,478.962	5,368.268	2,721.180	374.083	4,091.465	27.535	26,059.809	52,853.482	49.31	NA	39.74
2034	7,066.106	1,529.225	5,536.881	2,808.165	383.803	4,167.808	28.567	26,908.964	53,034.662	50.74	NA	39.74
2035	7,293.830	1,581.495	5,712.336	2,898.665	393.990	4,238.226	29.638	27,849.923	53,159.773	52.39	NA	39.74
2036	7,530.308	1,635.217	5,895.091	2,992.645	404.672	4,302.891	30.750	28,899.371	53,231.401	54.29	NA	39.74
2037	7,777.738	1,691.750	6,085.988	3,090.977	415.893	4,360.387	31.903	30,077.620	53,253.899	56.48	NA	39.74
2038	8,036.393	1,751.422	6,284.971	3,193.770	427.674	4,413.175	33.099	31,404.040	53,229.474	59.00	NA	39.74
2039	8,306.439	1,813.410	6,493.030	3,301.090	440.106	4,456.412	34.341	32,904.580	53,166.294	61.89	NA	39.74
2040	8,588.491	1,877.563	6,710.929	3,413.181	453.248	4,488.795	35.628	34,608.733	53,074.978	65.21	NA	39.74
2041	8,885.309	1,944.235	6,941.074	3,531.140	467.319	4,510.204	36.964	36,549.614	52,968.151	69.00	NA	39.74
2042	9,193.862	2,012.564	7,181.299	3,653.763	482.133	4,518.353	38.351	38,763.666	52,861.849	73.33	NA	39.74
2043	9,514.385	2,083.330	7,431.055	3,781.143	497.624	4,518.507	39.789	41,284.548	52,767.112	78.24	NA	39.74
2044	9,845.502	2,155.939	7,689.563	3,912.734	513.703	4,510.554	41.281	44,147.814	52,695.313	83.78	NA	39.74
2045	10,189.396	2,231.761	7,957.635	4,049.402	530.429	4,494.751	42.829	47,392.286	52,658.154	90.00	NA	39.74

¹ Payroll shown is pensionable pay. It 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 Excludes SMP contributions. Includes employer contributions.

Table 19
Additional Details
(\$ in Millions)

Fiscal Year Ending	Total Normal Cost ¹					Admin Expense During Following Fiscal Year					Normal Cost with Admin Expense				
	Tier 1	Tier 2		Optional Hybrid		Tier 1	Tier 2		Optional Hybrid		Tier 1	Tier 2		Optional Hybrid	
		Current	Future	Plan Future	Total		Current	Future	Plan Future	Total		Current	Future	Plan Future	Total
2018	\$ 598.399	\$ 87.621	\$ 0.000	\$ 0.000	\$ 686.020	\$ 11.927	\$ 3.924	\$ 0.000	\$ 0.000	\$ 15.851	\$ 610.325	\$ 91.545	\$ 0.000	\$ 0.000	\$ 701.870
2019	570.755	82.545	24.763	0.000	678.063	11.433	3.641	1.372	0.000	16.445	582.188	86.185	26.135	0.000	694.508
2020	544.037	78.516	49.529	0.000	672.082	10.892	3.380	2.790	0.000	17.062	554.929	81.896	52.318	0.000	689.143
2021	518.188	75.708	30.992	42.699	667.587	10.327	3.179	1.599	2.598	17.702	528.515	78.887	29.994	45.296	682.692
2022	493.482	73.748	37.303	56.005	660.538	9.890	3.074	1.944	3.458	18.366	503.372	76.821	35.788	59.463	675.444
2023	469.253	72.205	42.936	69.437	653.831	9.472	3.003	2.237	4.342	19.054	478.725	75.208	40.831	73.779	668.543
2024	445.420	70.955	48.933	83.038	648.346	9.041	2.943	2.541	5.244	19.769	454.461	73.898	46.229	88.282	662.870
2025	421.938	69.885	55.949	96.847	644.619	8.576	2.881	2.902	6.152	20.510	430.514	72.766	52.699	102.999	658.978
2026	399.000	69.035	62.197	110.949	641.181	8.126	2.829	3.230	7.094	21.280	407.126	71.863	58.333	118.043	655.365
2027	376.581	68.402	68.447	125.392	638.822	7.679	2.784	3.550	8.065	22.077	384.259	71.186	63.933	133.456	652.834
2028	354.603	67.996	74.866	140.161	637.626	7.230	2.743	3.874	9.059	22.905	361.833	70.739	69.681	149.220	651.473
2029	332.784	67.878	81.794	155.222	637.678	6.772	2.703	4.226	10.063	23.764	339.556	70.581	75.957	165.285	651.379
2030	310.640	67.913	88.376	170.703	637.632	6.315	2.669	4.566	11.106	24.656	316.955	70.581	81.836	181.809	651.181
2031	287.998	68.033	94.996	186.693	637.720	5.854	2.635	4.905	12.186	25.580	293.852	70.668	87.714	198.879	651.113
2032	265.031	68.178	101.747	203.212	638.168	5.390	2.600	5.248	13.301	26.539	270.421	70.778	93.694	216.513	651.406
2033	242.501	68.285	108.840	220.244	639.870	4.930	2.560	5.607	14.437	27.535	247.431	70.845	100.010	234.681	652.967
2034	220.723	68.379	115.814	237.746	642.662	4.487	2.519	5.959	15.602	28.567	225.210	70.898	106.172	253.348	655.628
2035	199.089	68.528	122.851	255.786	646.254	4.051	2.478	6.311	16.799	29.638	203.140	71.006	112.362	272.585	659.093
2036	177.357	68.729	130.002	274.430	650.518	3.621	2.436	6.664	18.029	30.750	180.978	71.165	118.637	292.459	663.239
2037	155.632	68.822	137.389	293.715	655.558	3.197	2.390	7.026	19.290	31.903	158.828	71.213	125.125	313.005	668.171
2038	134.134	68.827	144.804	313.698	661.463	2.784	2.340	7.386	20.589	33.099	136.917	71.167	131.601	334.287	673.972
2039	113.596	68.749	152.301	334.341	668.987	2.393	2.286	7.744	21.918	34.341	115.989	71.035	138.127	356.259	681.410
2040	94.679	68.482	159.868	355.595	678.624	2.034	2.225	8.099	23.270	35.628	96.713	70.708	144.697	378.865	690.983
2041	78.417	67.991	167.563	377.479	691.450	1.721	2.157	8.451	24.636	36.964	80.137	70.148	151.378	402.114	703.777
2042	65.311	67.217	175.222	399.833	707.583	1.461	2.082	8.794	26.014	38.351	66.772	69.299	158.002	425.847	719.920
2043	54.564	66.107	182.904	422.772	726.347	1.243	1.999	9.132	27.415	39.789	55.807	68.106	164.621	450.187	738.721
2044	45.634	64.493	190.633	446.416	747.176	1.057	1.905	9.468	28.850	41.281	46.692	66.398	171.251	475.266	759.607
2045	38.176	62.324	198.462	470.885	769.847	0.899	1.800	9.806	30.325	42.829	39.075	64.124	177.942	501.210	782.351
2046	31.931	59.647	206.324	496.159	794.061	0.763	1.686	10.142	31.844	44.435	32.694	61.332	184.622	528.003	806.651

¹ Normal Cost excludes expense portion.

The Optional Hybrid Plan is expected to be established July 1, 2019, and members are expected to be able to first elect to participate beginning in fiscal year 2020.

Table 20
Additional Details
(\$ in Millions)

Fiscal Year Ending	Expected Defined Benefit Plan Pay ¹					Total Normal Cost Rate ¹					Employer Normal Cost Rate				
	Tier 1	Tier 2		Optional Hybrid		Tier 1	Tier 2		Optional Hybrid	Combined	Tier 1	Optional Hybrid			
		Current	Future	Plan Future	Total		Current	Future				Plan Future	Total	Tier 2	Plan
2018	\$ 2,601.473	\$ 855.926	\$ 0.000	\$ 0.000	\$ 3,457.399	23.46%	10.70%			20.30%	10.70%	15.45%	2.69%		12.29%
2019	2,458.869	782.990	294.998	0.000	3,536.857	23.68%	11.01%	8.86%		19.64%	10.42%	15.67%	2.41%		11.63%
2020	2,324.313	721.350	595.303	0.000	3,640.966	23.87%	11.35%	8.79%		18.93%	10.19%	15.86%	2.18%		11.23%
2021	2,196.284	675.999	339.968	552.460	3,764.711	24.06%	11.67%	9.59%	8.20%	18.20%	10.97%	16.05%	2.96%	2.00%	10.59%
2022	2,074.818	644.840	407.723	725.528	3,852.909	24.26%	11.91%	9.63%	8.20%	17.62%	11.03%	16.25%	3.02%	2.00%	10.08%
2023	1,957.212	620.612	462.248	897.192	3,937.264	24.46%	12.12%	9.77%	8.22%	17.09%	11.12%	16.45%	3.11%	2.02%	9.62%
2024	1,842.861	599.898	517.842	1,068.782	4,029.383	24.66%	12.32%	9.94%	8.26%	16.58%	11.22%	16.65%	3.21%	2.06%	9.17%
2025	1,731.329	581.487	585.786	1,241.808	4,140.410	24.87%	12.51%	10.05%	8.29%	16.06%	11.28%	16.86%	3.27%	2.09%	8.72%
2026	1,623.067	565.013	645.196	1,416.886	4,250.162	25.08%	12.72%	10.14%	8.33%	15.59%	11.34%	17.07%	3.33%	2.13%	8.29%
2027	1,517.956	550.285	701.858	1,594.219	4,364.318	25.31%	12.94%	10.26%	8.37%	15.14%	11.44%	17.30%	3.43%	2.17%	7.91%
2028	1,415.828	537.089	758.561	1,773.957	4,485.435	25.56%	13.17%	10.38%	8.41%	14.73%	11.54%	17.55%	3.53%	2.21%	7.54%
2029	1,316.209	525.464	821.419	1,956.061	4,619.153	25.80%	13.43%	10.47%	8.45%	14.32%	11.63%	17.79%	3.62%	2.25%	7.18%
2030	1,217.857	514.662	880.480	2,141.811	4,754.810	26.03%	13.71%	10.56%	8.49%	13.93%	11.72%	18.02%	3.71%	2.29%	6.84%
2031	1,120.290	504.251	938.604	2,332.054	4,895.199	26.23%	14.01%	10.64%	8.53%	13.55%	11.82%	18.22%	3.81%	2.33%	6.50%
2032	1,023.945	493.907	996.959	2,526.902	5,041.713	26.41%	14.33%	10.73%	8.57%	13.18%	11.92%	18.40%	3.91%	2.37%	6.18%
2033	930.875	483.382	1,058.648	2,725.810	5,198.715	26.58%	14.66%	10.81%	8.61%	12.84%	12.02%	18.57%	4.01%	2.41%	5.87%
2034	842.056	472.738	1,118.390	2,928.136	5,361.320	26.75%	15.00%	10.89%	8.65%	12.52%	12.11%	18.74%	4.10%	2.45%	5.59%
2035	755.931	462.335	1,177.525	3,134.607	5,530.398	26.87%	15.36%	10.97%	8.70%	12.22%	12.21%	18.86%	4.20%	2.50%	5.32%
2036	671.932	452.160	1,236.635	3,345.914	5,706.641	26.93%	15.74%	11.05%	8.74%	11.94%	12.31%	18.92%	4.30%	2.54%	5.07%
2037	590.358	441.423	1,297.482	3,562.389	5,891.652	26.90%	16.13%	11.13%	8.79%	11.67%	12.40%	18.89%	4.39%	2.59%	4.83%
2038	511.719	430.199	1,357.710	3,784.620	6,084.248	26.76%	16.54%	11.21%	8.83%	11.42%	12.49%	18.75%	4.48%	2.63%	4.61%
2039	437.966	418.451	1,417.577	4,011.990	6,285.984	26.48%	16.98%	11.29%	8.88%	11.19%	12.59%	18.47%	4.58%	2.68%	4.41%
2040	370.840	405.850	1,476.955	4,243.702	6,497.347	26.08%	17.42%	11.37%	8.93%	10.99%	12.68%	18.07%	4.67%	2.73%	4.24%
2041	312.863	392.307	1,536.671	4,479.857	6,721.698	25.61%	17.88%	11.45%	8.98%	10.84%	12.76%	17.60%	4.75%	2.78%	4.10%
2042	265.015	377.647	1,594.981	4,718.377	6,956.020	25.20%	18.35%	11.54%	9.03%	10.72%	12.84%	17.19%	4.83%	2.83%	4.01%
2043	224.915	361.733	1,652.394	4,960.648	7,199.690	24.81%	18.83%	11.62%	9.08%	10.64%	12.92%	16.80%	4.91%	2.88%	3.94%
2044	190.896	343.918	1,709.188	5,208.004	7,452.006	24.46%	19.31%	11.71%	9.13%	10.58%	12.98%	16.45%	4.97%	2.93%	3.90%
2045	161.878	324.138	1,766.090	5,461.797	7,713.903	24.14%	19.78%	11.79%	9.18%	10.54%	13.03%	16.13%	5.02%	2.98%	3.87%
2046	137.088	302.862	1,822.451	5,721.893	7,984.294	23.85%	20.25%	11.88%	9.23%	10.50%	13.07%	15.84%	5.06%	3.03%	3.85%

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

The Optional Hybrid Plan is expected to be established July 1, 2019, and members are expected to be able to first elect to participate beginning in fiscal year 2020.

Table 21
Additional Details
(\$ in Millions)

Fiscal Year Ending	SMP Total Active Members	Number of Defined Benefit Plan Active Members					Defined Benefit Plan Payroll ¹					Member Contributions				
		Tier 2		Optional Hybrid			Tier 2		Optional Hybrid			Tier 2		Optional Hybrid		
		Tier 1	Current	Future	Plan Future	Total	Tier 1	Current	Future	Plan Future	Total	Tier 1	Current	Future	Plan Future	Total
2017	11,852	42,886	21,231	0	0	64,117	\$ 2,559.243	\$ 774.077	\$ 0.000	\$ 0.000	\$ 3,333.320					\$ 278.643
2018	12,297	38,490	17,910	7,272	0	63,672	2,468.288	788.341	284.798	0.000	3,541.427	\$ 197.710	\$ 63.146	\$ 22.812	\$ 0.000	283.668
2019	12,748	34,507	15,010	13,704	0	63,221	2,336.212	725.709	582.078	0.000	3,643.999	187.131	58.129	46.624	0.000	291.884
2020	13,154	30,915	12,654	4,812	14,434	62,815	2,208.096	674.991	217.584	659.469	3,760.140	176.869	54.067	17.428	40.887	289.251
2021	13,426	27,990	11,301	5,813	17,439	62,543	2,087.995	641.419	280.258	851.976	3,861.648	167.247	51.378	22.449	52.823	293.897
2022	13,623	25,415	10,357	6,643	19,931	62,346	1,971.631	616.695	337.179	1,028.912	3,954.417	157.928	49.397	27.008	63.793	298.126
2023	13,798	23,062	9,559	7,387	22,163	62,171	1,858.662	595.871	392.310	1,202.318	4,049.161	148.879	47.729	31.424	74.544	302.576
2024	13,951	20,899	8,865	8,063	24,191	62,018	1,748.298	577.737	447.069	1,376.722	4,149.826	140.038	46.277	35.810	85.357	307.482
2025	14,081	18,915	8,257	8,678	26,038	61,888	1,640.718	561.133	502.970	1,556.906	4,261.727	131.421	44.947	40.288	96.528	313.184
2026	14,190	17,088	7,728	9,240	27,723	61,779	1,536.553	546.669	558.097	1,737.424	4,378.743	123.078	43.788	44.704	107.720	319.290
2027	14,286	15,398	7,254	9,758	29,273	61,683	1,435.011	533.183	612.723	1,919.404	4,500.321	114.944	42.708	49.079	119.003	325.734
2028	14,371	13,842	6,837	10,230	30,689	61,598	1,336.635	521.509	666.950	2,103.281	4,628.375	107.064	41.773	53.423	130.403	332.663
2029	14,443	12,397	6,462	10,666	32,001	61,526	1,239.905	510.898	721.973	2,292.845	4,765.621	99.317	40.923	57.830	142.156	340.226
2030	14,503	11,048	6,116	11,075	33,227	61,466	1,143.927	500.633	777.026	2,486.061	4,907.647	91.628	40.101	62.240	154.136	348.105
2031	14,564	9,785	5,794	11,456	34,370	61,405	1,048.710	490.697	832.088	2,682.981	5,054.476	84.002	39.305	66.650	166.345	356.302
2032	14,628	8,622	5,485	11,808	35,426	61,341	955.150	480.480	887.152	2,883.809	5,206.591	76.508	38.486	71.061	178.796	364.851
2033	14,690	7,567	5,193	12,129	36,390	61,279	866.464	470.139	942.436	3,089.229	5,368.268	69.404	37.658	75.489	191.532	374.083
2034	14,749	6,600	4,915	12,426	37,279	61,220	781.185	459.675	997.600	3,298.421	5,536.881	62.573	36.820	79.908	204.502	383.803
2035	14,802	5,701	4,659	12,702	38,105	61,167	697.727	449.823	1,052.763	3,512.023	5,712.336	55.888	36.031	84.326	217.745	393.990
2036	14,849	4,875	4,413	12,958	38,874	61,120	616.634	439.793	1,108.018	3,730.646	5,895.091	49.393	35.227	88.752	231.300	404.672
2037	14,895	4,109	4,173	13,198	39,594	61,074	537.925	428.884	1,163.669	3,955.510	6,085.988	43.087	34.354	93.210	245.242	415.893
2038	14,940	3,410	3,947	13,418	40,254	61,029	462.618	417.987	1,219.163	4,185.203	6,284.971	37.055	33.481	97.655	259.483	427.674
2039	14,982	2,798	3,723	13,616	40,850	60,987	393.596	406.050	1,274.282	4,419.102	6,493.030	31.527	32.525	102.070	273.984	440.106
2040	15,016	2,267	3,506	13,795	41,385	60,953	331.303	393.334	1,328.968	4,657.324	6,710.929	26.538	31.506	106.450	288.754	453.248
2041	15,041	1,846	3,291	13,948	41,843	60,928	280.386	379.528	1,382.772	4,898.388	6,941.074	22.459	30.400	110.760	303.700	467.319
2042	15,056	1,508	3,079	14,081	42,245	60,913	237.844	364.583	1,435.830	5,143.042	7,181.299	19.051	29.203	115.010	318.869	482.133
2043	15,068	1,233	2,865	14,200	42,603	60,901	202.041	348.235	1,488.341	5,392.438	7,431.055	16.183	27.894	119.216	334.331	497.624
2044	15,077	1,008	2,643	14,310	42,931	60,892	171.345	329.505	1,540.600	5,648.113	7,689.563	13.725	26.393	123.402	350.183	513.703
2045	15,084	825	2,421	14,409	43,230	60,885	145.327	309.320	1,592.604	5,910.384	7,957.635	11.640	24.777	127.568	366.444	530.429

¹ Payroll shown is pensionable pay. It 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.

The Optional Hybrid Plan is expected to be established July 1, 2019, and members are expected to be able to first elect to participate beginning in fiscal year 2020.

Table 22
Additional Details
(\$ in Millions)

Fiscal Year Ending	Present Value of Future Benefits							Benefit Payments						
	Current Retirees	Current Inactives	Tier 1 Actives	Tier 2 Actives		Optional Hybrid		Current Retirees	Current Inactives	Tier 1 Actives	Tier 2 Actives		Optional Hybrid	
				Current	Future	Plan Future	Total				Current	Future	Plan Future	Total
2017	\$ 28,225.964	\$ 2,650.073	\$ 15,347.864	\$ 1,245.730	\$ 0.000	\$ 0.000	\$ 47,469.631	2,369.812	51.550	95.491	34.554	0.000	0.000	\$ 2,429.467
2018	27,818.132	2,788.817	16,361.693	1,300.261	196.806	0.000	48,465.709	2,374.686	70.605	160.718	40.400	2.259	0.000	2,648.668
2019	27,375.683	2,917.887	17,381.473	1,352.691	420.266	0.000	49,448.000	2,374.686	80.775	241.927	42.537	8.245	0.000	2,762.351
2020	26,886.472	3,045.782	18,391.087	1,406.709	193.979	477.173	50,401.202	2,388.867	80.775	241.927	42.537	8.245	0.000	2,762.351
2021	26,350.912	3,170.758	19,386.794	1,470.578	270.755	666.006	51,315.803	2,399.372	92.547	326.035	36.807	4.460	11.035	2,870.256
2022	25,769.558	3,291.586	20,361.483	1,545.102	352.798	867.662	52,188.189	2,406.101	105.301	416.036	30.989	8.603	22.210	2,989.240
2023	25,143.269	3,405.044	21,311.363	1,629.964	441.055	1,085.249	53,015.944	2,408.791	120.877	508.226	26.224	11.970	31.018	3,107.106
2024	24,473.210	3,508.558	22,233.593	1,726.107	535.741	1,319.840	53,797.049	2,407.211	138.421	601.423	21.272	15.086	38.785	3,222.198
2025	23,760.841	3,601.681	23,120.285	1,833.361	637.494	1,573.659	54,527.321	2,401.157	155.702	700.302	17.274	16.668	41.904	3,333.007
2026	23,008.071	3,684.251	23,970.574	1,950.294	745.547	1,844.647	55,203.384	2,390.299	172.412	797.527	15.435	20.184	50.905	3,446.762
2027	22,217.193	3,756.906	24,777.082	2,074.860	860.224	2,133.968	55,820.233	2,374.398	187.766	899.329	16.252	23.848	60.363	3,561.956
2028	21,390.802	3,817.093	25,536.717	2,205.012	984.066	2,447.883	56,381.573	2,353.321	204.891	1,001.050	19.578	25.464	64.753	3,669.057
2029	20,531.949	3,863.001	26,245.229	2,341.000	1,118.020	2,789.299	56,888.498	2,326.815	222.893	1,103.595	23.054	26.363	66.835	3,769.555
2030	19,644.035	3,893.230	26,896.014	2,482.947	1,262.298	3,158.945	57,337.469	2,294.751	241.246	1,208.937	26.820	28.349	72.031	3,872.134
2031	18,730.888	3,906.073	27,482.681	2,630.979	1,417.334	3,558.414	57,726.369	2,256.956	260.151	1,316.409	30.882	30.561	77.736	3,972.695
2032	17,796.729	3,901.982	27,998.384	2,785.064	1,583.553	3,989.302	58,055.014	2,213.319	277.401	1,426.004	35.400	32.849	83.492	4,068.465
2033	16,846.136	3,945.217	28,441.139	2,945.097	1,761.408	4,453.394	58,392.391	2,163.791	231.417	1,532.545	40.443	34.896	88.373	4,091.465
2034	15,884.070	3,978.229	28,808.514	3,111.032	1,951.347	4,952.302	58,685.494	2,108.320	244.315	1,636.328	45.948	37.653	95.244	4,167.808
2035	14,915.717	4,001.322	29,095.548	3,282.972	2,154.040	5,488.354	58,937.953	2,047.042	256.203	1,739.625	51.766	40.717	102.873	4,238.226
2036	13,946.438	4,014.248	29,297.485	3,460.943	2,370.120	6,063.871	59,153.105	1,980.144	267.638	1,841.890	57.980	44.068	111.171	4,302.891
2037	12,981.783	4,016.165	29,411.220	3,644.512	2,600.376	6,681.668	59,335.724	1,907.824	279.173	1,941.195	65.032	47.542	119.621	4,360.387
2038	12,027.474	4,006.247	29,433.042	3,833.231	2,845.071	7,343.140	59,488.205	1,830.301	290.735	2,037.910	72.912	51.631	129.686	4,413.175
2039	11,089.073	3,984.818	29,362.560	4,026.624	3,104.543	8,049.899	59,617.517	1,748.132	301.156	2,128.567	81.609	56.143	140.805	4,456.412
2040	10,172.062	3,951.302	29,202.172	4,224.190	3,379.332	8,804.231	59,733.289	1,661.783	311.327	2,210.447	91.120	61.093	153.025	4,488.795
2041	9,281.697	3,906.111	28,954.134	4,425.118	3,669.594	9,607.198	59,843.852	1,571.855	320.255	2,283.854	101.703	66.415	166.122	4,510.204
2042	8,422.912	3,849.887	28,625.355	4,628.076	3,976.036	10,461.734	59,964.000	1,479.032	327.744	2,344.454	113.810	72.388	180.925	4,518.353
2043	7,600.198	3,783.251	28,218.503	4,831.618	4,299.378	11,370.800	60,103.748	1,384.079	333.863	2,396.826	127.454	78.978	197.307	4,518.507
2044	6,817.575	3,706.458	27,738.287	5,033.779	4,640.389	12,337.645	60,274.133	1,287.771	339.005	2,439.184	143.037	86.235	215.322	4,510.554
2045	6,078.460	3,619.990	27,190.494	5,232.087	4,999.625	13,365.046	60,485.702	1,190.972	342.971	2,470.819	160.910	94.161	234.918	4,494.751

The Optional Hybrid Plan is expected to be established July 1, 2019, and members are expected to be able to first elect to participate beginning in fiscal year 2020.

Table 23
Additional Details
(\$ in Millions)

Fiscal Year Ending	Actuarial Accrued Liability						Total
	Current Retirees	Current Inactives	Tier 1 Actives	Tier 2 Actives		Optional Hybrid Plan Future	
				Current	Future		
2017	\$ 28,225.964	\$ 2,650.073	\$ 10,669.989	\$ 307.322	\$ 0.000	\$ 0.000	\$ 41,853.348
2018	27,818.132	2,788.817	11,964.383	384.560	0.000	0.000	42,955.892
2019	27,375.683	2,917.887	13,256.442	456.086	23.305	0.000	44,029.403
2020	26,886.472	3,045.782	14,530.402	526.413	67.749	0.000	45,056.818
2021	26,350.912	3,170.758	15,782.855	604.865	44.122	88.807	46,042.319
2022	25,769.558	3,291.586	17,007.314	692.999	69.087	138.201	46,968.745
2023	25,143.269	3,405.044	18,199.984	790.860	94.434	199.739	47,833.330
2024	24,473.210	3,508.558	19,357.924	899.650	122.763	273.619	48,635.724
2025	23,760.841	3,601.681	20,473.094	1,019.360	163.640	359.060	49,377.676
2026	23,008.071	3,684.251	21,544.671	1,148.772	208.541	457.746	50,052.052
2027	22,217.193	3,756.906	22,565.294	1,286.065	257.362	570.762	50,653.582
2028	21,390.802	3,817.093	23,531.809	1,429.447	313.409	704.010	51,186.570
2029	20,531.949	3,863.001	24,439.600	1,579.502	381.972	858.150	51,654.174
2030	19,644.035	3,893.230	25,281.182	1,736.572	459.239	1,035.143	52,049.401
2031	18,730.888	3,906.073	26,049.028	1,900.948	545.507	1,236.785	52,369.229
2032	17,796.729	3,901.982	26,735.261	2,072.712	641.716	1,465.128	52,613.528
2033	16,846.136	3,945.217	27,337.576	2,251.817	750.983	1,721.753	52,853.482
2034	15,884.070	3,978.229	27,853.529	2,438.303	871.836	2,008.695	53,034.662
2035	14,915.717	4,001.322	28,277.506	2,632.439	1,004.788	2,328.001	53,159.773
2036	13,946.438	4,014.248	28,603.809	2,834.422	1,150.581	2,681.903	53,231.401
2037	12,981.783	4,016.165	28,828.426	3,043.843	1,311.175	3,072.507	53,253.899
2038	12,027.474	4,006.247	28,946.906	3,260.291	1,486.287	3,502.269	53,229.474
2039	11,089.073	3,984.818	28,958.820	3,483.345	1,676.578	3,973.660	53,166.294
2040	10,172.062	3,951.302	28,867.214	3,712.443	1,882.759	4,489.198	53,074.978
2041	9,281.697	3,906.111	28,676.101	3,946.683	2,106.185	5,051.374	52,968.151
2042	8,422.912	3,849.887	28,394.801	4,184.565	2,347.043	5,662.641	52,861.849
2043	7,600.198	3,783.251	28,027.741	4,424.414	2,605.959	6,325.549	52,767.112
2044	6,817.575	3,706.458	27,580.955	4,663.842	2,883.582	7,042.901	52,695.313
2045	6,078.460	3,619.990	27,061.290	4,899.874	3,180.907	7,817.633	52,658.154

The Optional Hybrid Plan is expected to be established July 1, 2019, and members are expected to be able to first elect to participate beginning in fiscal year 2020.

Table 24
Additional Details
(\$ in Millions)

Fiscal Year	Defined Benefit Plan Payroll ¹					Defined Benefit Plan Payroll in Excess of Governor's Pay ²			Fiscal Year	Employer Normal Cost Rate				Fiscal Year	Employer Normal Cost Contributions Required by Statute ³							
	Ending	Tier 2		Optional Hybrid	Total	Tier 1	Tier 2			Total	Ending	Tier 1	Tier 2		Optional Hybrid	Total	Ending	Tier 1	Tier 2		Optional Hybrid	Total
		Current	Future				Current	Future											Current	Future		
2017	\$ 2,559.243	\$ 774.077	\$ 0.000	\$ 0.000	\$ 3,333.320	\$ 47.193	\$ 0.000	\$ 47.193	2018	15.45%	2.69%		12.29%	2019					\$ 4.146			
2018	2,468.288	788.341	284.798	0.000	3,541.427	57.209	0.000	57.209	2019	15.67%	2.41%		11.63%	2020	\$ 6.274	\$ 0.000	\$ 0.000	\$ 0.000	6.274			
2019	2,336.212	725.709	582.078	0.000	3,643.999	53.617	0.000	53.617	2020	15.86%	2.18%		11.23%	2021	5.954	0.000	0.000	0.000	5.954			
2020	2,208.096	674.991	217.584	659.469	3,760.140	49.702	0.000	49.702	2021	16.05%	2.96%	2.00%	10.59%	2022	5.585	0.000	6.446	13.183	25.214			
2021	2,087.995	641.419	280.258	851.976	3,861.648	46.082	0.000	46.082	2022	16.25%	3.02%	2.00%	10.08%	2023	5.242	0.000	8.456	17.004	30.702			
2022	1,971.631	616.695	337.179	1,028.912	3,954.417	42.595	0.000	42.595	2023	16.45%	3.11%	2.02%	9.62%	2024	4.905	0.000	10.476	20.818	36.199			
2023	1,858.662	595.871	392.310	1,202.318	4,049.161	38.789	0.000	38.789	2024	16.65%	3.21%	2.06%	9.17%	2025	4.521	0.000	12.580	24.768	41.868			
2024	1,748.298	577.737	447.069	1,376.722	4,149.826	35.489	0.000	35.489	2025	16.86%	3.27%	2.09%	8.72%	2026	4.187	0.000	14.599	28.832	47.619			
2025	1,640.718	561.133	502.970	1,556.906	4,261.727	32.371	0.000	32.371	2026	17.07%	3.33%	2.13%	8.29%	2027	3.869	0.000	16.771	33.180	53.820			
2026	1,536.553	546.669	558.097	1,737.424	4,378.743	29.501	0.000	29.501	2027	17.30%	3.43%	2.17%	7.91%	2028	3.573	0.000	19.115	37.724	60.413			
2027	1,435.011	533.183	612.723	1,919.404	4,500.321	26.870	0.000	26.870	2028	17.55%	3.53%	2.21%	7.54%	2029	3.300	0.000	21.610	42.452	67.362			
2028	1,336.635	521.509	666.950	2,103.281	4,628.375	24.376	0.000	24.376	2029	17.79%	3.62%	2.25%	7.18%	2030	3.035	0.000	24.123	47.322	74.481			
2029	1,239.905	510.898	721.973	2,292.845	4,765.621	22.197	0.000	22.197	2030	18.02%	3.71%	2.29%	6.84%	2031	2.799	0.000	26.791	52.473	82.064			
2030	1,143.927	500.633	777.026	2,486.061	4,907.647	20.156	0.000	20.156	2031	18.22%	3.81%	2.33%	6.50%	2032	2.571	0.000	29.617	57.877	90.065			
2031	1,048.710	490.697	832.088	2,682.981	5,054.476	18.149	0.000	18.149	2032	18.40%	3.91%	2.37%	6.18%	2033	2.338	0.000	32.569	63.542	98.449			
2032	955.150	480.480	887.152	2,883.809	5,206.591	16.348	0.000	16.348	2033	18.57%	4.01%	2.41%	5.87%	2034	2.125	0.000	35.541	69.488	107.154			
2033	866.464	470.139	942.436	3,089.229	5,368.268	14.611	0.000	14.611	2034	18.74%	4.10%	2.45%	5.59%	2035	1.916	0.000	38.631	75.754	116.301			
2034	781.185	459.675	997.600	3,298.421	5,536.881	12.995	0.000	12.995	2035	18.86%	4.20%	2.50%	5.32%	2036	1.716	0.000	41.863	82.328	125.907			
2035	697.727	449.823	1,052.763	3,512.023	5,712.336	11.506	0.000	11.506	2036	18.92%	4.30%	2.54%	5.07%	2037	1.524	0.000	45.232	89.233	135.989			
2036	616.634	439.793	1,108.018	3,730.646	5,895.091	10.155	0.000	10.155	2037	18.89%	4.39%	2.59%	4.83%	2038	1.343	0.000	48.643	96.488	146.475			
2037	537.925	428.884	1,163.669	3,955.510	6,085.988	8.864	0.000	8.864	2038	18.75%	4.48%	2.63%	4.61%	2039	1.163	0.000	52.163	104.139	157.466			
2038	462.618	417.987	1,219.163	4,185.203	6,284.971	7.618	0.000	7.618	2039	18.47%	4.58%	2.68%	4.41%	2040	0.985	0.000	55.787	112.157	168.930			
2039	393.596	406.050	1,274.282	4,419.102	6,493.030	6.498	0.000	6.498	2040	18.07%	4.67%	2.73%	4.24%	2041	0.822	0.000	59.465	120.540	180.827			
2040	331.303	393.334	1,328.968	4,657.324	6,710.929	5.492	0.000	5.492	2041	17.60%	4.75%	2.78%	4.10%	2042	0.677	0.000	63.143	129.290	193.110			
2041	280.386	379.528	1,382.772	4,898.388	6,941.074	4.633	0.000	4.633	2042	17.19%	4.83%	2.83%	4.01%	2043	0.557	0.000	66.808	138.393	205.759			
2042	237.844	364.583	1,435.830	5,143.042	7,181.299	3.905	0.000	3.905	2043	16.80%	4.91%	2.88%	3.94%	2044	0.459	0.000	70.440	147.871	218.770			
2043	202.041	348.235	1,488.341	5,392.438	7,431.055	3.310	0.000	3.310	2044	16.45%	4.97%	2.93%	3.90%	2045	0.381	0.000	73.975	157.766	232.122			
2044	171.345	329.505	1,540.600	5,648.113	7,689.563	2.811	0.000	2.811	2045	16.13%	5.02%	2.98%	3.87%	2046	0.317	0.000	77.363	168.124	245.804			
2045	145.327	309.320	1,592.604	5,910.384	7,957.635	2.368	0.000	2.368	2046	15.84%	5.06%	3.03%	3.85%	2047	0.263	0.000	80.601	178.952	259.816			

¹ Payroll shown is pensionable pay. It 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 Governor's pay is \$177,500 in 2017 and is projected to increase annually by 3.75 percent.

³ Employer normal cost contributions do not include the additional 2 percent of pay contribution which begins in 2021 because it is assumed that it will not be used to pay toward the current members' unfunded liability. Employer contributions for the defined contribution plan component of the Optional Hybrid Plan are not included. FY 2019 based on excess pay amount as provided by SURS and the total employer normal cost rate. FY 2020 and thereafter based on excess pay amount projected by GRS and the employer 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.

The Optional Hybrid Plan is expected to be established July 1, 2019, and members are expected to be able to first elect to participate beginning in fiscal year 2020.

APPENDIX F

HISTORICAL SCHEDULES

DRAFT

Table 25
Historical Schedule of Funding Status
(\$ in 000s)

As of June 30	Actuarial Value			Funding Ratio	Payroll/DB*	UAAL as % of Payroll
	of Assets	AAL	UAAL			
2002	\$ 9,814,677	\$ 16,654,041	\$6,839,364	58.93 %	\$2,607,155	262.33 %
2003	9,714,547	18,025,032	8,310,485	53.89	2,763,428	300.73
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	18,588,873	41,853,348	23,264,475	44.41	3,458,320	672.71

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, and decreased from 7.75 percent to 7.25 percent in plan year 2014.

Table 26
Historical Schedule of 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.

APPENDIX G

ACTUARIAL METHODS AND ASSUMPTIONS

DRAFT

Actuarial Methods and Assumptions

Projected Unit Credit Method

The Projected Unit Credit Method is mandated under Section 15-155 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, 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" and "Optional Hybrid Plan members").* Pensionable pay does not include amounts in excess of the pay cap (\$112,408 in 2017 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 and the federal Social Security Wage Base for the Optional Hybrid Plan) 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.

Actuarial Methods and Assumptions

Employer Contributions

- 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.
 - The employer normal cost for fiscal years 2018, 2019 and 2020.
 - The employer normal cost plus two percent of pay for fiscal years 2021 and thereafter.
 - 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.
- 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.)

Following is a table with the recognition schedule for the phase in of actuarial assumption changes. 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.

		\$ in Millions				
Amount from Valuation Year Ending 6/30		2014	2015	2016	2017	Total
First Affected FY Contribution		2016	2017	2018	2019	
Assumption Change Impact*	\$	87.6	\$ 57.5	\$ -	\$ -	
Projected FY 2018 Total Payroll	\$	4,593.5	\$ 4,593.5	\$ 4,593.5	\$ 4,593.5	
Assumption Impact as Percent of Payroll		1.91%	1.25%	0.00%	0.00%	
Fiscal Year		Cumulative Portion Recognized By Future Fiscal Year				
2018		80%	60%	40%	20%	
2019		100%	80%	60%	40%	
2020		100%	100%	80%	60%	
2021		100%	100%	100%	80%	
2022		100%	100%	100%	100%	
		Portion Not Yet Recognized By Future Fiscal Year				
2018		20%	40%	60%	80%	
2019		0%	20%	40%	60%	
2020		0%	0%	20%	40%	
2021		0%	0%	0%	20%	
2022		0%	0%	0%	0%	
		Percentage of Payroll				
Amount from Valuation Year Ending 6/30		2014	2015	2016	2017	Total
Portion Not Recognized for FY 2019		0.38%	0.50%	0.00%	0.00%	0.88%
Portion Not Recognized for FY 2020		0.00%	0.25%	0.00%	0.00%	0.25%
Portion Not Recognized for FY 2021		0.00%	0.00%	0.00%	0.00%	0.00%
Portion Not Recognized for FY 2022		0.00%	0.00%	0.00%	0.00%	0.00%
Portion Not Recognized for FY 2023		0.00%	0.00%	0.00%	0.00%	0.00%

*Change in first affected fiscal year contribution due to assumption changes.

Actuarial Methods and Assumptions

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

Year	\$ in Millions						
	Governor's Pay	Pay for Preceding Fiscal Year for Affected Members		Employer Normal Cost Rate	Excess Pay*ER NC Rate	Additional Adjustments	Estimated Employer Contributions
		Excess Pay	Cost Rate				
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	

Asset Valuation Method

Prior to the actuarial valuation as of June 30, 2009, market value of assets was used. Under statute 15-155(l), beginning with the June 30, 2009, actuarial valuation, 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, and after	7.25%

Actuarial Methods and Assumptions

Actuarial Assumptions (Most Adopted Effective with the June 30, 2015, Actuarial Valuation)

Under statute 15-155(a), 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 2010-2014 experience study report issued to the Board of Trustees on January 16, 2015.

Rate of Investment Return. For all purposes under the system the rate of investment return is assumed to be 7.25% per annum beginning with the **June 30, 2014**, valuation. This assumption is net of investment expenses.

Price Inflation (Increase in Consumer Price Index "CPI"). The assumed rate is 2.75% per annum.

Effective Rate of Interest. The actuarial valuation assumed rate credited to member accounts is 7.00% per annum, beginning with the June 30, 2013, actuarial valuation.

Cost of Living Adjustment "COLA." The assumed rate is 3.00% per annum for members hired before January 1, 2011, based on the benefit provision of 3.00% annual compound increases. The assumed rate is 1.375% for members hired on or after January 1, 2011, based on the benefit provision of increases equal to ½ of the increase in CPI with a maximum increase of 3.00%.

Annual Compensation Increases. Each member's compensation is assumed to increase by 3.75% each year, 2.75% reflecting salary inflation and 1.00% reflecting standard of living increases. That rate is increased for members with less than 34 years of service. The total assumed increase follows:

<u>Service Year</u>	<u>Total Increase</u>
0	15.00%
1	12.00%
2	9.00%
3	7.25%
4	6.50%
5	6.00%
6	5.75%
7	5.50%
8	5.25%
9	5.00%
10	4.75%
11	4.50%
12-13	4.25%
14-33	4.00%
34+	3.75%

Payroll Growth. The assumed rate of total payroll growth is 3.75%.

Actuarial Methods and Assumptions

Mortality. The mortality assumptions are as follows:

Base Table with 2014 Base Year	Male Set Forward	Female Set Forward	Male Multiplier	Female Multiplier
RP-2014 White Collar Employee, sex distinct (pre-retirement)	None	None	110% pre 60, 80% at ages 60+	90% pre 60, 90% at ages 60+
RP-2014 White Collar Healthy Annuitant, sex distinct (non-disabled post-retirement)	1 year	1 year	100%	100%
RP-2014 Disabled Annuitant, sex distinct (disabled post-retirement)	9 years	10 years	100%	100%

The provision for future mortality improvement is based on the generational application of the MP-2014 improvement scales.

Sample Mortality Rates

Age	Future Life Expectancy (years) in 2017				Future Life Expectancy (years) in 2030			
	Postretirement		Disabled - Retiree		Postretirement		Disabled - Retiree	
	Male	Female	Male	Female	Male	Female	Male	Female
35	52.09	54.17	29.80	34.56	53.33	55.36	31.72	36.32
40	46.85	48.96	26.36	30.47	48.08	50.14	28.14	32.12
45	41.70	43.80	23.14	26.67	42.91	44.97	24.74	28.18
50	36.66	38.72	20.07	23.00	37.84	39.86	21.50	24.37
55	31.76	33.71	17.06	19.36	32.90	34.82	18.33	20.61
60	26.99	28.80	14.15	15.84	28.07	29.87	15.25	16.97
65	22.37	24.07	11.37	12.60	23.38	25.09	12.34	13.60
70	17.97	19.57	8.80	9.79	18.91	20.53	9.63	10.65
75	13.90	15.37	6.56	7.42	14.76	16.25	7.24	8.13

Actuarial Methods and Assumptions

Disability. A table of disability incidence with rates follows:

Age	Male	Female	Age	Male	Female
20	0.042%	0.060%	50	0.206%	0.249%
21	0.043%	0.064%	51	0.219%	0.257%
22	0.044%	0.067%	52	0.231%	0.264%
23	0.045%	0.071%	53	0.244%	0.272%
24	0.046%	0.074%	54	0.256%	0.279%
25	0.047%	0.078%	55	0.264%	0.287%
26	0.048%	0.081%	56	0.271%	0.294%
27	0.049%	0.085%	57	0.279%	0.302%
28	0.050%	0.088%	58	0.286%	0.309%
29	0.051%	0.092%	59	0.294%	0.317%
30	0.054%	0.099%	60	0.301%	0.324%
31	0.056%	0.107%	61	0.309%	0.332%
32	0.059%	0.114%	62	0.316%	0.339%
33	0.061%	0.122%	63	0.324%	0.347%
34	0.064%	0.129%	64	0.331%	0.354%
35	0.067%	0.137%	65	0.339%	0.362%
36	0.071%	0.144%	66	0.346%	0.369%
37	0.074%	0.152%	67	0.354%	0.377%
38	0.078%	0.159%	68	0.361%	0.384%
39	0.081%	0.167%	69	0.369%	0.392%
40	0.091%	0.174%	70	0.369%	0.392%
41	0.101%	0.182%	71	0.369%	0.392%
42	0.111%	0.189%	72	0.369%	0.392%
43	0.121%	0.197%	73	0.369%	0.392%
44	0.131%	0.204%	74	0.369%	0.392%
45	0.144%	0.212%	75	0.369%	0.392%
46	0.156%	0.219%	76	0.369%	0.392%
47	0.169%	0.227%	77	0.369%	0.392%
48	0.181%	0.234%	78	0.369%	0.392%
49	0.194%	0.242%	79	0.369%	0.392%

Disability rates apply during the retirement eligibility period.

Actuarial Methods and Assumptions

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

Age	Members Hired Before January 1, 2011, and Eligible for		Members Hired on or after January 1, 2011, and Eligible for		Optional Hybrid Plan Members Eligible for	
	Normal Retirement	Early Retirement	Normal Retirement	Early Retirement	Normal Retirement	Early Retirement
Under 50	50.0%	-	-	-	-	-
50	45.0	-	-	-	-	-
51	45.0	-	-	-	-	-
52	45.0	-	-	-	-	-
53	40.0	-	-	-	-	-
54	40.0	-	-	-	-	-
55	38.0	7.5%	-	-	-	-
56	36.0	6.0	-	-	-	-
57	30.0	4.5	-	-	-	-
58	30.0	5.5	-	-	-	-
59	30.0	6.0	-	-	-	-
60	11.0	-	-	-	-	-
61	11.0	-	-	-	-	-
62	13.0	-	-	35.0%	-	-
63	13.0	-	-	15.0	-	-
64	13.0	-	-	15.0	-	-
65	17.0	-	-	15.0	-	-
66	17.0	-	-	15.0	-	-
67	15.0	-	50.0%	-	75.0%	-
68	15.0	-	35.0	-	40.0	-
69	15.0	-	30.0	-	35.0	-
70-74	15.0	-	15.0	-	15.0	-
75-79	20.0	-	20.0	-	20.0	-
80+	100.0	-	100.0	-	100.0	-

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.

Actuarial Methods and Assumptions

General Turnover. A table of termination rates based on experience in the 2010-2014 period. The assumption is a table of turnover rates by years of service. A sample of these rates follows:

<u>Years of Service</u>	<u>All Members</u>
0	20.00%
1	20.00
2	15.00
3	14.00
4	12.00
5	10.00
6	9.00
7	7.50
8	6.75
9	6.00
10	5.25
11	4.50
12	4.00
13	3.70
14	3.20
15	3.00
16	3.00
17	3.00
18	3.00
19	3.00
20	2.50
21	2.50
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.

Actuarial Methods and Assumptions

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.

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

<u>Age</u>	<u>Males</u>	<u>Females</u>
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. Reciprocal service will be collected and analyzed in the future and will be considered in the next experience review.

Actuarial Methods and Assumptions

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:

- 60% elect to participate in the Optional Hybrid Plan.
 - 75% are assumed to elect the Tradition Plan (consistent with the current election split).
 - 25% are assumed to elect the Portable Plan (consistent with the current election split).
- 20% elect to participate in the Self Managed Plan.
- 20% elect to participate in the Tier 2 Plan.
 - 75% are assumed to elect the Tradition Plan (consistent with the current election split).
 - 25% are assumed to elect the Portable Plan (consistent with the current election split).

New entrants have an average age of 37.1 and average capped pay of \$40,441 and average uncapped pay of \$43,362 (2017 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 2017 dollars) of current active members with service between one and four years.

Age	Number Males	Average Pay			Number Females	Average Pay			Total Number	Average Pay		
		Tier 2 Capped Male	OHP Capped Male	Uncapped Male		Tier 2 Capped Female	OHP Capped Female	Uncapped Female		Tier 2 Capped Total	OHP Capped Total	Uncapped Total
<20	46	\$18,659	\$18,659	\$18,659	42	\$16,791	\$16,791	\$16,791	88	\$17,767	\$17,767	\$17,767
20 - 24	667	28,055	28,055	28,055	1,004	27,205	27,205	27,205	1,671	27,544	27,544	27,544
25 - 29	1,516	38,300	38,427	38,614	2,090	36,036	36,112	36,237	3,606	36,988	37,085	37,236
30 - 34	1,339	45,371	45,960	48,192	1,818	39,324	39,565	40,341	3,157	41,889	42,278	43,671
35 - 39	964	45,934	46,670	50,025	1,309	38,359	38,697	39,923	2,273	41,572	42,078	44,208
40 - 44	645	44,847	45,592	47,833	1,014	37,079	37,346	38,354	1,659	40,099	40,552	42,039
45 - 49	571	41,560	42,321	44,978	863	34,291	34,551	35,282	1,434	37,185	37,645	39,143
50 - 54	537	40,206	41,192	46,145	711	33,280	33,647	35,123	1,248	36,260	36,894	39,866
55 - 59	422	38,279	39,495	46,410	500	32,431	32,976	35,050	922	35,108	35,960	40,249
60 - 64	230	33,523	34,581	39,898	236	30,822	31,504	34,940	466	32,155	33,023	37,387
65 - 69	13	21,922	22,949	32,512	11	16,208	16,208	16,208	24	19,303	19,859	25,039
Total	6,950	40,441	41,003	43,362	9,598	35,378	35,610	36,426	16,548	37,504	37,875	39,339

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 2018 are \$478,854 and actual FY 2016 SMP employer forfeitures used to reduce the certified contributions for FY 2019 are \$8,079,804. Estimated SMP expenses for FY 2019 and after are assumed to increase by 2.75%. Estimated SMP employer forfeitures used to reduce the certified contributions for FY 2020 and after are assumed to be 7.5% of the gross SMP employer contribution.

Pensionable Earnings Greater than 6%. No additional assumption was made for earnings used in the calculation of the final average compensation. 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%.

Actuarial Methods and Assumptions

Governor's Pay. The governor's pay is \$177,500 as of June 30, 2017, and is expected to increase each year by the assumed rate of total payroll growth of 3.75%.

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APPENDIX H

SUMMARY OF BENEFIT PROVISIONS OF SURS

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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.

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Summary of Benefit Provisions of SURS

General

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”) and members hired after July 6, 2017 (“Optional Hybrid Plan”). Members hired before January 1, 2011, participate in Tier 1. Members in Tiers 1, 2 and the Optional Hybrid Plan are eligible to choose either the Traditional or the Portable Plan.

Tier 2 and Optional Hybrid Plan members who participate in the Traditional and Portable Plans are subject to the pay caps established under Public Act 96-0889 and Public Act 100-0023, respectively. 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 Optional Hybrid Plan pay cap is equal to the federal Social Security Wage Base.

The pay cap history is as follows:

Year	CPI-U	½ CPI-U	CPI-W	Tier 2 Pensionable Pay Cap	Optional Hybrid Plan 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	\$127,200.00

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 and Optional Hybrid Plan pay caps.

The Optional Hybrid Plan is a hybrid plan. Members who elect to participate in the Optional Hybrid Plan (instead of Tier 2 or SMP) participate in both a defined benefit (DB) plan and a defined contribution (DC) plan. Under the DC plan, employees contribute a minimum of 4% of salary and employers contribute a rate between 2% and 6% of salary. Optional Hybrid Plan DC plan benefits are funded by the employers

Summary of Benefit Provisions of SURS

and are not included in this actuarial valuation.

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. Optional Hybrid Plan members contribute the lesser of 6.2% of pensionable compensation and the total normal cost rate for the Optional Hybrid Plan defined benefit plan.

The total contribution is broken down as follows:

	Tier 1 and Tier 2		Optional Hybrid Plan
	Police/Fire	All Others	All*
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%	6.2%

* *Optional Hybrid Plan members contribute the lesser of 6.2% of pensionable compensation and the total normal cost rate for the Optional Hybrid Plan 3 defined benefit plan.*

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 and Optional Hybrid Plan members are assumed not to be made on pay in excess of the respective pay caps.

Since January 1, 1981, the member contributions under SURS have been “picked up” 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

Summary of Benefit Provisions of SURS

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 7.00%.

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.
Tier 2	High final eight consecutive year average compensation within the last ten years.
Optional Hybrid Plan	Final average salary equal to the average salary during the last ten years of service.

The Tier 2 and Optional Hybrid Plan pay caps are 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	Optional Hybrid Plan
Age 62/5 Years	Age 67/10 Years	Age 67/10 Years*
Age 60/8 Years		
Any age/30 Years		

* Optional Hybrid Plan members are eligible to retire at their normal Social Security retirement age, but no earlier than age 67 with 10 years of service.

Summary of Benefit Provisions of SURS

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:

Year of Service	Tier 1 and Tier 2		Optional Hybrid
	General	Police/Fire	All Members
1 st 10 Years	2.20 %	2.25 %	1.25 %
Next 10 Years	2.20	2.50	1.25
Over 20	2.20	2.75	1.25

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

Summary of Benefit Provisions of SURS

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 and Optional Hybrid Plan 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, 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

Summary of Benefit Provisions of SURS

January after retirement shall be proportional based on the portion of the year retired.

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.

For Optional Hybrid Plan members, each January 1 subsequent to retirement date, the monthly benefit under the DB Plan being paid each retiree shall be increased by fifty percent of the Consumer Price Index-Workers ("CPI-W") 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%

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.

There is no early retirement provision for the Optional Hybrid Plan.

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.

Summary of Benefit Provisions of SURS

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 and Optional Hybrid Plan 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.

Benefit Duration

Surviving spouse

May receive a lifetime benefit commencing at the later of the member's date of death and the spouse's attainment of age 50. May be payable at the 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 until dependency conditions are not met, so long as they were dependent upon the member at the time of their death.

Summary of Benefit Provisions of SURS

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 adjustment for the first January after retirement shall be proportional.

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 annuity.

For Optional Hybrid Plan 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-Workers ("CPI-W") 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 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, Tier 2 and Optional Hybrid Plan 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, 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.

For 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% of the originally granted survivor annuity. The first increase will be granted upon January 1 following the

Summary of Benefit Provisions of SURS

first anniversary of the commencement of the annuity.

Lump Sum Death Benefit

Eligibility

Death of member prior to retirement.

Traditional Plan

Benefit

With Eligible Survivor

- Refund of accumulated member contributions for retirement and annual adjustment at 4.5% interest

Without Eligible Survivor

- Refund of the total accumulated member contribution at 4.5% interest; and
- \$5,000 to a dependent beneficiary or \$2,500 to a non-dependent beneficiary.

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 or \$1,000.

Summary of Benefit Provisions of SURS

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

50% of the basic compensation paid at 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 that began first participating prior to January 1, 2011 (Tier 1). The benefit is based on the greatest of three formulas (General Formula, Money

Summary of Benefit Provisions of SURS

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.

Summary of Benefit Provisions of SURS

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, 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, 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.

APPENDIX I

GLOSSARY OF TERMS

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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. Currently required for accounting purposes by the Governmental Accounting Standards Board (GASB).

Asset Return. The net investment return for the asset divided by the mean asset value. Example: if \$1.00 is invested and yields \$1.08 after a year, the asset return is 8.00 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

Net Pension Obligation (“NPO”). The accumulated value of contribution variances (the difference between the Annual Pension Contribution and the actual employer contributions). Currently required for accounting purposes by the Governmental Accounting Standards Board (GASB).

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.”

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