



Commission on Government Forecasting and Accountability

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MONTHLY BRIEFING FOR THE MONTH ENDED: NOVEMBER 2020

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SPECIAL PENSION BRIEFING

STATE RETIREMENT SYSTEMS OVERVIEW

Julie Bae, Pension Analyst

The Commission has reviewed the State-funded retirement systems' FY 2020 preliminary actuarial reports, which were issued prior to November 1st, pursuant to P.A. 97-0694, the State Actuary Law. Under the State Actuary Law, the systems must annually submit a proposed certification for the following fiscal year prior to November 1st of the current calendar year. The State Actuary then must issue a preliminary report concerning the systems' proposed certification by January 1st. The State Actuary's report must identify any recommended changes in actuarial assumptions based upon the review of the retirement systems' actuarial assumptions.

Using the actuarial (smoothed) value of assets, the total unfunded liabilities of the State systems totaled \$141.0 billion on June 30, 2020, led by the Teachers' Retirement System (TRS), whose unfunded liabilities amounted to \$80.7 billion. As the largest of the State systems, TRS accounts for approximately 57.2% of the total assets and liabilities of the five State systems combined. The State Employees' Retirement System (SERS) had unfunded liabilities of \$30.8 billion, approximately 21.8% of the total unfunded liabilities of the five systems, followed by the State Universities Retirement System (SURS) with unfunded liabilities of \$27.5 billion, which represents 19.5% of the total unfunded liabilities. Table 1, on the following page, provides a summary of the financial condition of each of the five State retirement systems, showing their respective liabilities and assets as well as their accumulated unfunded liabilities and funded ratios.

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SPECIAL PENSION BRIEFING:
State Retirement Systems Overview

TABLE 1

Summary of Financial Condition FY 2020				
State Retirement Systems Combined				
Assets at Actuarial Value / With Asset Smoothing (P.A. 96-0043)				
(\$ in Millions)				
<u>System</u>	<u>Accrued Liability</u>	<u>Actuarial Assets</u>	<u>Unfunded Liability</u>	<u>Funded Ratio</u>
TRS	\$135,598.5	\$54,891.0	\$80,707.6	40.5%
SERS	\$50,145.8	\$19,389.5	\$30,756.3	38.7%
SURS	\$47,580.5	\$20,071.4	\$27,509.1	42.2%
JRS	\$2,849.9	\$1,121.3	\$1,728.6	39.3%
GARS	\$373.5	\$63.9	\$309.6	17.1%
TOTAL	\$236,548.2	\$95,537.0	\$141,011.2	40.4%

A more realistic valuation of the true financial position of the State retirement systems would be based upon the market value of the assets, as shown in Table 2 below. Based upon the market value of assets, the combined unfunded liabilities of the State systems totaled \$144.4 billion on June 30, 2020. TRS, whose unfunded liabilities amounted to \$83.3 billion, represents approximately 57.7% of the combined total unfunded balance. Table 2 provides a summary of the financial condition of each of the five State retirement systems, showing their respective liabilities and assets as well as their accumulated unfunded liabilities and funded ratios.

TABLE 2

Summary of Financial Condition FY 2020				
State Retirement Systems Combined				
Assets at Market Value / Without Asset Smoothing (P.A. 96-0043)				
(\$ in Millions)				
<u>System</u>	<u>Accrued Liability</u>	<u>Market Assets</u>	<u>Unfunded Liability</u>	<u>Funded Ratio</u>
TRS	\$135,598.5	\$52,316.5	\$83,282.1	38.6%
SERS	\$50,145.8	\$19,191.4	\$30,954.4	38.3%
SURS	\$47,580.5	\$19,514.6	\$28,065.9	41.0%
JRS	\$2,849.9	\$1,112.5	\$1,737.3	39.0%
GARS	\$373.5	\$63.0	\$310.5	16.9%
TOTAL	\$236,548.2	\$92,198.0	\$144,350.2	39.0%

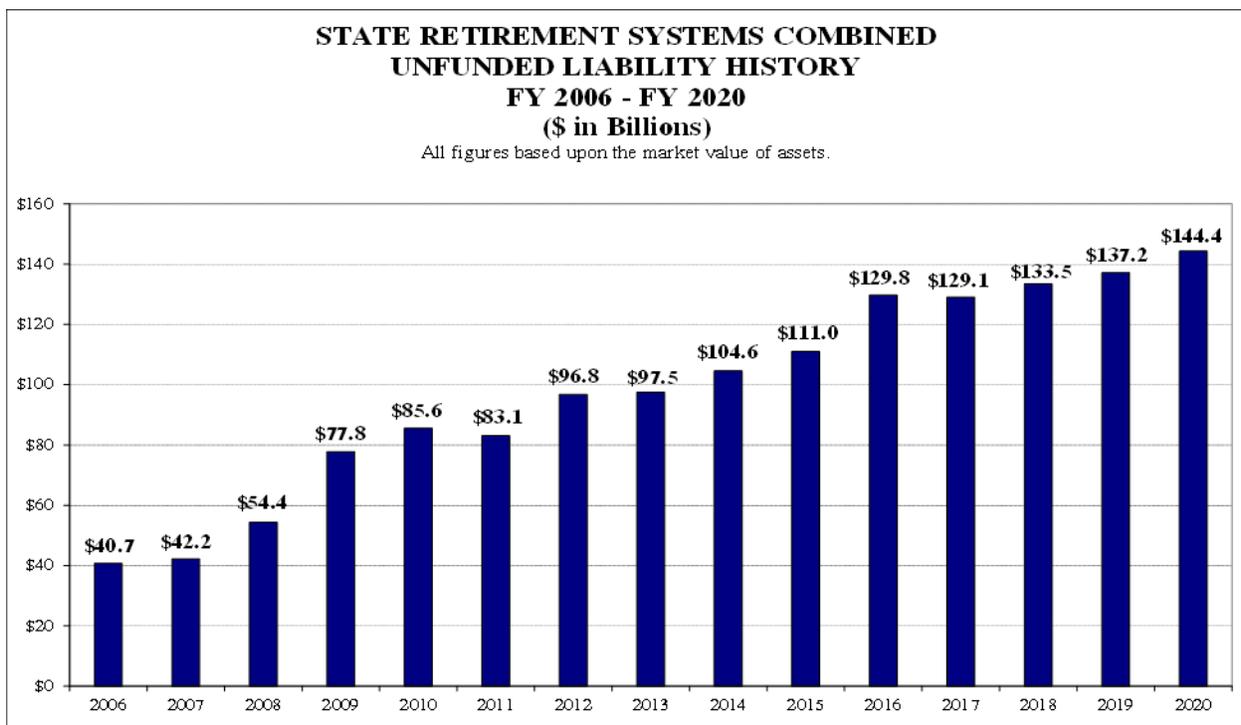
The funded ratios of the respective systems may be compared to the aggregate funded ratio. The combined funded ratios based on the actuarial and market value of assets for FY 2020 are 40.4% and 39.0%, respectively, as shown in Tables 1 and 2 (the 15-year history of the systems' cumulative funded ratio is shown in Chart 6). While GARS has the poorest funded ratio, the other four pension systems are approximately 40% funded.

Chart 1 below shows a 15-year history of the cumulative unfunded State pension liability and is based upon calculations performed by the retirement systems' actuaries using the *market value* of assets for all years, including FY 2020.

The aggregate unfunded liability has been growing significantly over the past 15 years. One of the main drivers continues to be actuarially insufficient State contributions determined by the current pension funding policy under P.A. 88-0593. As the actuaries for the State retirement systems have noted in the respective annual actuarial valuation reports, the funding plan under P.A. 88-0593 produces employer (State) contributions that are actuarially insufficient, meaning if all other actuarial assumptions are met, unfunded liabilities will still increase due to the State contributing an amount that is not sufficient to stop the growth in the unfunded liability. Hence, there is a distinction between contributions that are statutorily sufficient and contributions that are considered actuarially sufficient (the annual reports of the State Actuary have noted this distinction as well).

Other reasons for an increase in unfunded liability would be the results of poor investment performance, unfavorable actuarial experiences, or actuarial assumptions changes that increase the liability such as a reduction in assumed investment returns. Further details on the main factors affecting unfunded liability can be found in Charts 4 and 5.

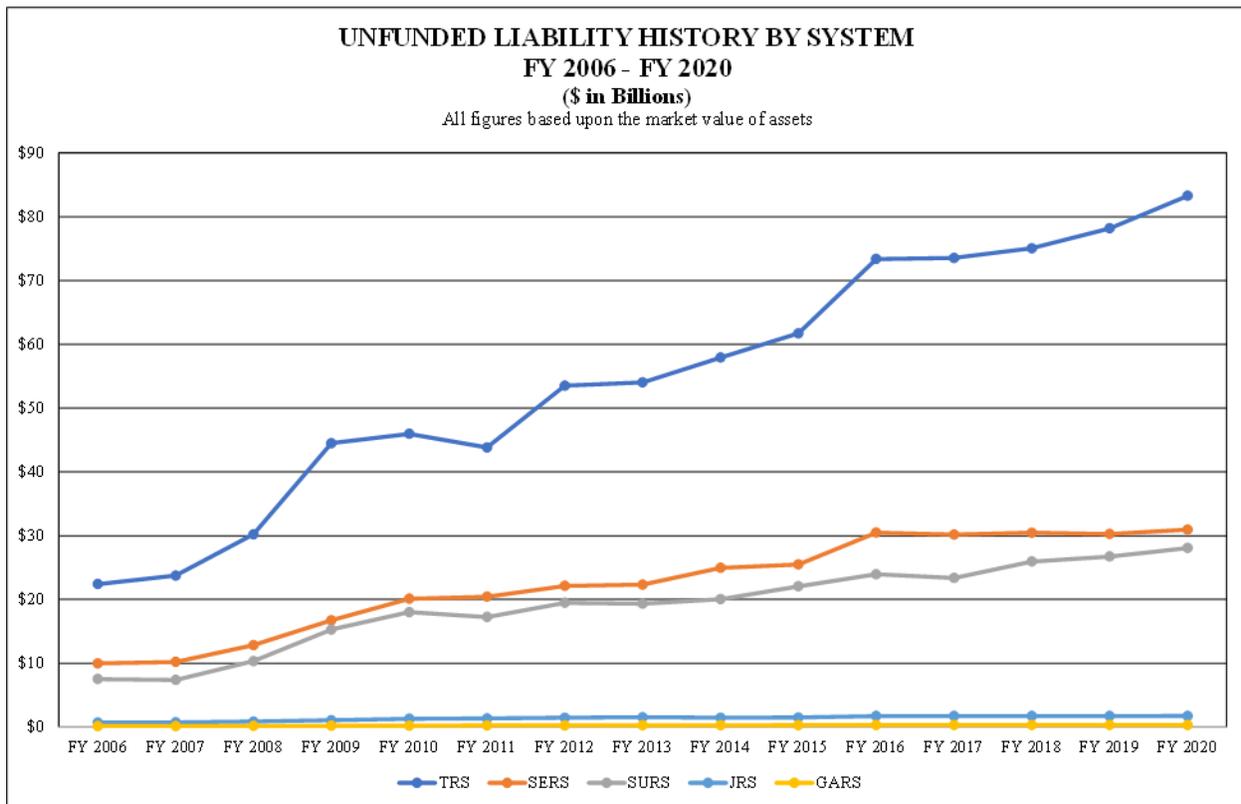
CHART 1



When taking a close look at the unfunded liability during the past 5 years, it has worsened, except for FY 2017 when the unfunded liability slightly decreased for the first time since FY 2011. The slight, pleasant decline mainly resulted from higher-than-expected investment returns by all the systems. However, the unfunded liability began to rise again, and it reached \$144.4 billion in FY 2020. The main common driver behind the continued growth during the recent years was, again, the actuarially insufficient state contributions under the statutory funding plan while each fiscal year had some other factors that led to the deterioration of the financial condition of the pension systems.

For example, the sudden uptick in FY 2016 was due in part to reduced assumed investment rates by TRS, SERS, and GARS and lower-than-projected investment returns. Similarly, a small increase in the unfunded liability during FY 2018 was partially affected by a reduction in SURS' investment returns assumption and the five systems' unfavorable actuarial experiences from demographic and other factors. For FY 2019 and 2020, one of the common causes was lower-than-expected investment returns, meaning all the five systems did not meet their respective actuarially assumed rates of return. Especially, the five systems experienced poorer investment performances in FY 2020, due to the national and global economic turmoil associated with the COVID-19 pandemic. Details on the factors affecting the unfunded liability in FY 2020 can be found in Chart 4.

CHART 2



Like Chart 1, Chart 2 above presents the unfunded liability history of the five systems over the last 15 years but provides a more detailed picture of how the unfunded liability of the respective systems has changed during the same time period. As shown, the three biggest systems, TRS, SERS, and SURS, are the main drivers behind the growth in the combined unfunded liability. Especially, TRS has contributed the most to the increase in the aggregate unfunded liability over the years. While this may be due in part to the size of TRS being the biggest among the five systems, there may be some other reasons that are worth noting. One of the steepest slopes in the TRS trend line can be seen between FY 2008 and FY 2009, which can be explained by its brutal investment losses that occurred during the Great Recession. TRS took a hard hit and

lost its investment assets by more than 20% in FY 2009. In addition, TRS experienced one of its largest hikes in the unfunded liability in FY 2012 and FY 2016 as TRS reduced its assumed investment rate by 0.5%, respectively.

Table 3 below shows the historical changes in the investment return assumptions for each of the five State systems. None of the five systems made changes to their respective assumed investment rates in FY 2020. The last time SERS, JRS, and GARS changed their investment rates assumption was FY 2019 while TRS last changed their rate in FY 2016. It was FY 2018 for SURS.

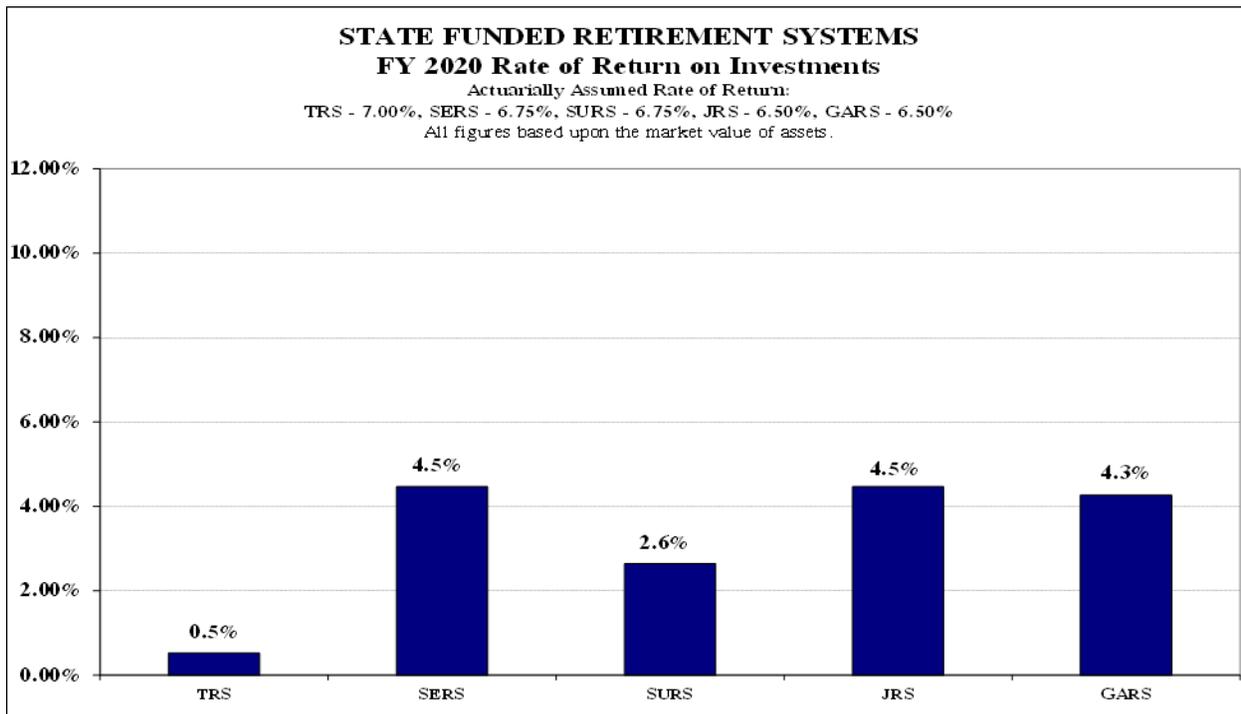
TABLE 3

Historical Change in Investment Rate Assumptions							
System	Prior to FY 10	FY 10	FY 12	FY 14	FY 16	FY 18	FY 19 - Present
TRS	8.50%	8.50%	<u>8.00%</u>	<u>7.50%</u>	<u>7.00%</u>	7.00%	7.00%
SERS	8.50%	<u>7.75%</u>	7.75%	<u>7.25%</u>	<u>7.00%</u>	7.00%	<u>6.75%</u>
SURS	8.50%	<u>7.75%</u>	7.75%	<u>7.25%</u>	7.25%	<u>6.75%</u>	6.75%
JRS	8.00%	<u>7.00%</u>	7.00%	7.00%	<u>6.75%</u>	6.75%	<u>6.50%</u>
GARS	8.00%	<u>7.00%</u>	7.00%	7.00%	<u>6.75%</u>	6.75%	<u>6.50%</u>

NOTE: The years associated with investment rate assumption changes above reflect the actuarial valuation year, not the fiscal year in which the State contribution was calculated using the new rate. Changes in the assumed investment rates are bold, italicized, and underlined.

Chart 3 presents market investment return rates experienced by each of the systems in FY 2020. As mentioned earlier, all the five systems did not meet their actuarially assumed rates of return, and thus actuarial losses occurred due to lower-than-assumed investment returns.

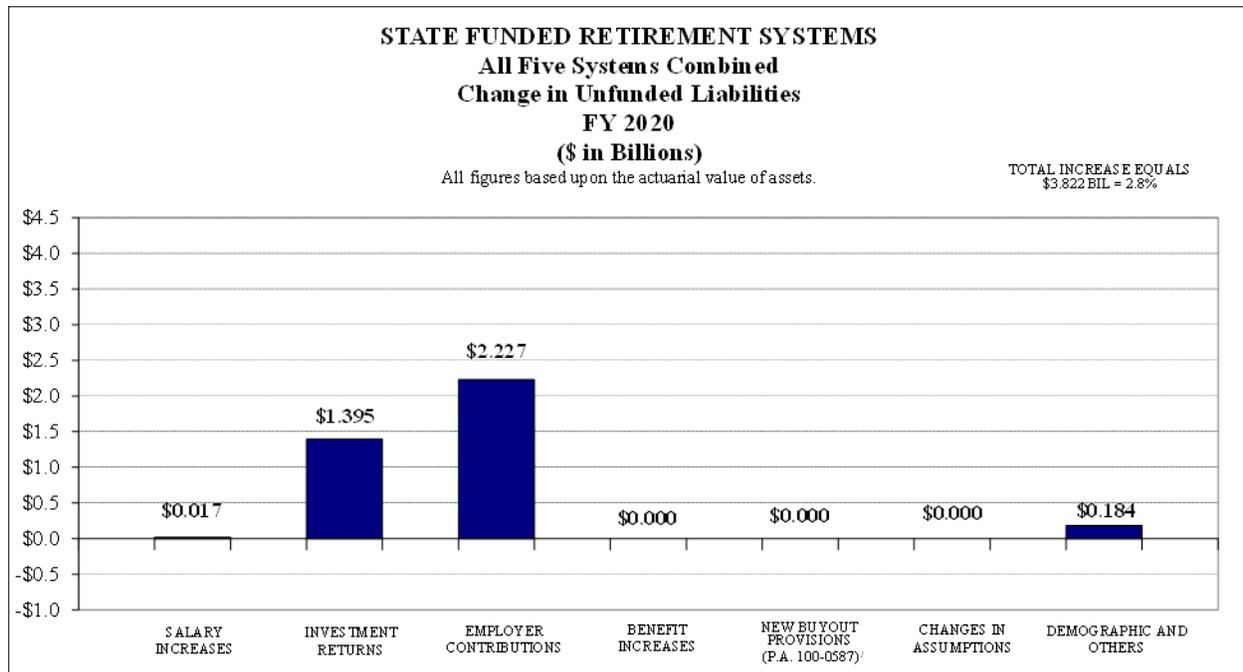
CHART 3



To reduce the impact of volatile investment performance from year-to-year, asset smoothing was implemented beginning with the FY 2009 actuarial valuation reports of the state systems with the adoption of P.A. 96-0043, which took effect on July 15, 2009. Asset smoothing is a technique that averages the annual fluctuation in investment performance over a period of five years. Also, actuarial assumption smoothing was implemented pursuant to P.A. 100-0023, effective July 6, 2017. Actuarial assumption smoothing aims to “smooth out” the annual variation in the required State contribution due to any actuarial assumptions over a five-year period in equal annual amounts, beginning in the fiscal year in which the change first applies to the required State contribution.

Chart 4 outlines the factors that have caused the unfunded liability to change for FY 2020 only.

CHART 4



¹ P.A. 100-0587, effective June 4, 2018, created the two voluntary Accelerated Pension Benefit Payment Programs (the pension buyout programs) for TRS, SURS, and SERS. Then, P.A. 101-0010, effective June 5, 2019, extended the buyout programs by 3 more years to June 30th, 2024. The three systems have implemented the two buyout programs since the implementation of P.A. 100-0587. While TRS and SERS realized an actuarial gain in FY 2018 and 2019, respectively, SURS has not yet. In FY 2020, none of the three systems reported either actuarial gains or losses associated with the buyout programs.

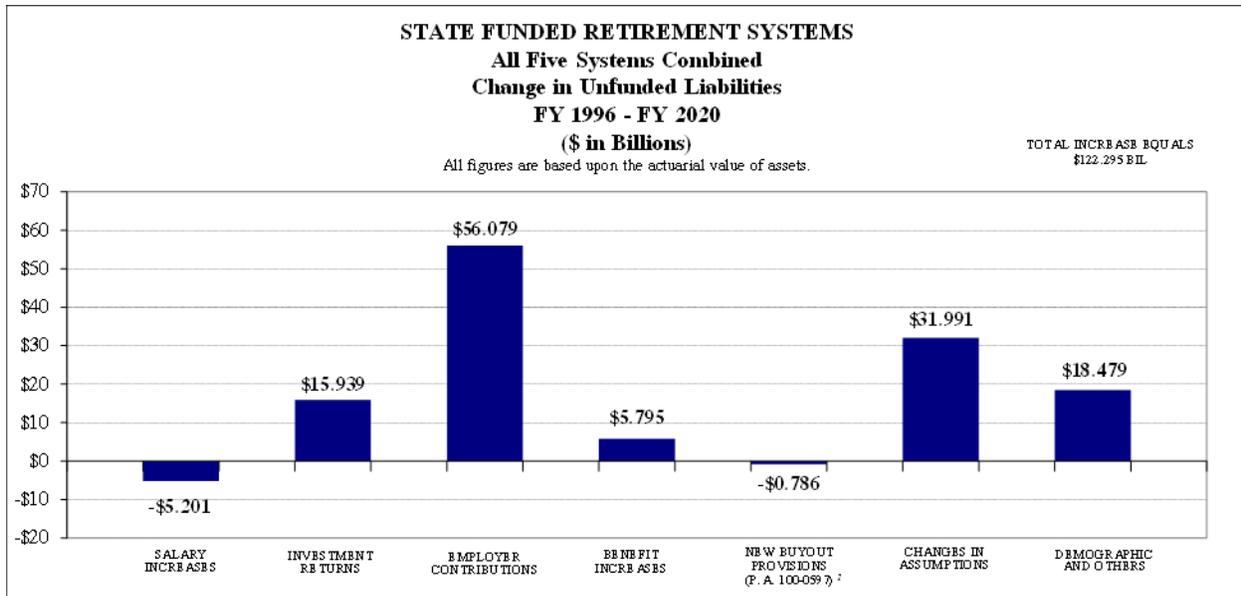
At the end of FY 2019, the aggregate unfunded liability based on the actuarial value of assets was \$137.189 billion. The unfunded liability based on the actuarial value of assets stood at \$141.011 billion as of FY 2020. It grew by \$3.822 billion during FY 2020, an increase of 2.8% over FY 2019. The primary reason was, again, actuarially insufficient State contributions, which increased the unfunded liability by \$2.227 billion, accounting for 58.3% of the total increase.

There were three more factors that worsened the unfunded liability. One was an actuarial loss that resulted from lower-than-assumed investment returns by all the five systems due to the COVID-19 pandemic. It brought the combined unfunded liability up by \$1.395 billion, accounting for 36.5% of the total increase. The other two factors, which are demographic/other factors and salary increases, had a relatively slight impact on the unfunded liability. The unfavorable experiences from demographic and other factors, mainly by TRS and SURS such as earlier retirement than assumed, led to an increase of \$184 million in the unfunded liability. Higher-than-assumed salary increases made it to grow by \$17 million.

No actuarial gains were reported by the systems in FY 2020. It is worth noting that TRS, SERS, and SURS have implemented the two voluntary pension buyout programs under P.A. 100-0587 and the three systems did not report either actuarial gains or losses associated with the programs in FY 2020.

Chart 5 below shows the change in the unfunded liability since the enactment of P.A. 88-0593 in FY 1996, which created the 50-year funding policy that governs annual State contributions to the five State systems.

CHART 5



¹ P.A. 100-0587, effective June 4, 2018, created the two voluntary Accelerated Pension Benefit Payment Programs (the pension buyout programs) for TRS, SURS, and SERS. Then, P.A. 101-0010, effective June 5, 2019, extended the buyout programs by 3 more years to June 30th, 2024. The three systems have implemented the two buyout programs since the implementation of P.A. 100-0587. While TRS and SERS realized an actuarial gain in FY 2018 and 2019, respectively, SURS has not yet. In FY 2020, none of the three systems reported either actuarial gains or losses associated with the buyout programs.

From FY 1996 through FY 2020, the unfunded liability increased by \$122.295 billion to \$141.011 billion. Actuarially insufficient State contributions contributed the most to the increase in unfunded liability, accounting for approximately 45.9% of the total increase. Assumption changes caused a \$31.991 billion increase, 26.2% of the total increase. “Demographic and other factors” and investment returns that did not meet assumed rates were the next factors that served to worsen the unfunded liability over time.

CHART 6

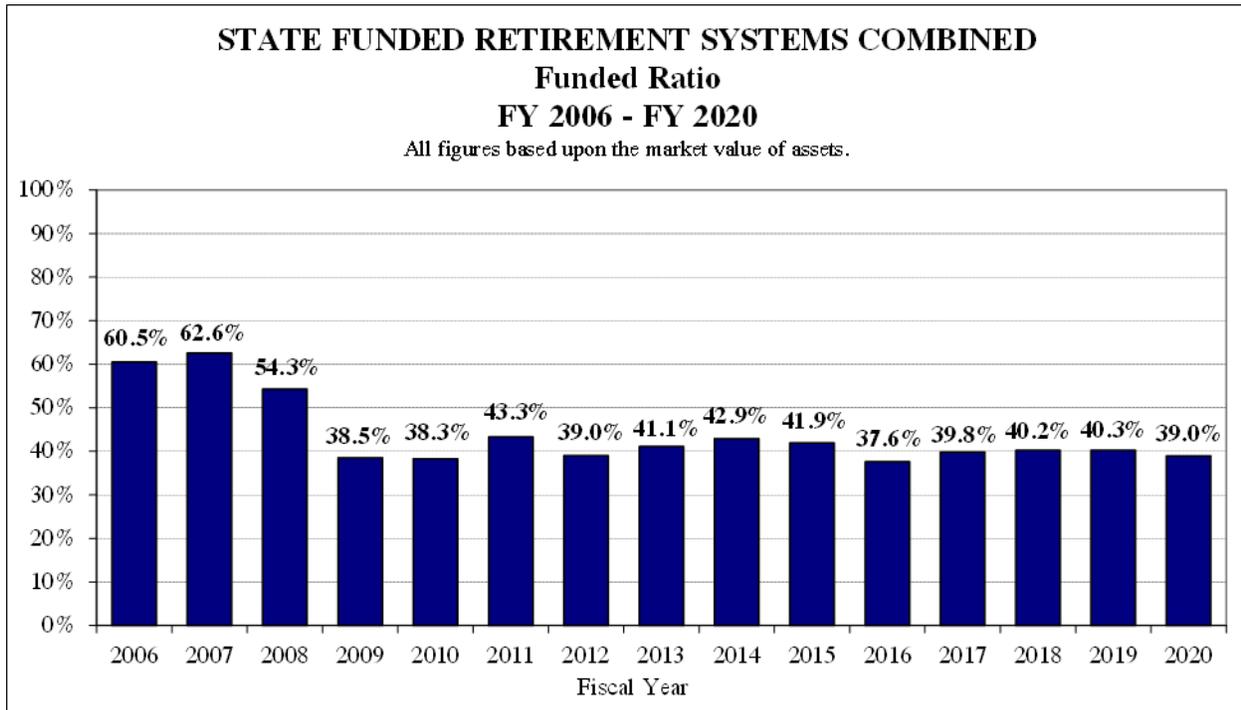


Chart 6 above shows the systems’ funded ratio based on the market value of assets, without the asset smoothing method. The funded ratio at any single point in time is less important than the trend over time. While both the unfunded liability (Chart 1) and funded ratio (Chart 6) illustrate the financial condition of the pension systems, the two are negatively correlated by nature. (i.e., when one rises, the other falls.)

In FY 2004, the State sold \$10 billion in pension obligation bonds and used part of the proceeds to pay all the contributions for FY 2004. The bond sale generated \$7.3 billion to reduce unfunded liabilities of the state-funded retirement systems. In the wake of the bond sale, the funded ratio remained relatively stable from FY 2004 through FY 2007. In FY 2008 and 2009, the funded ratio fell significantly due to much lower-than-expected investment returns during the 2007-2009 recession. While exceptionally strong investment returns helped improve the funded ratio to 43.3% in FY 2011, these gains were largely erased by poor investment returns in the following year. Since then, the combined funded ratio of the five systems has been hovering around 40% in the past decade.

In FY 2020, the aggregate funded ratio stood at 39.0%, a slight decline from FY 2019, in part because of lower investment returns caused by the pandemic as mentioned earlier.

Table 4 on the following page shows the FY 2021 State contributions based on the five systems’ final certification letters for FY 2021 and the FY 2022 estimated State contributions based on the systems’ preliminary certification letters for FY 2022. FY 2022 estimated State contributions were certified by the Boards of trustees of the five systems. FY 2021 State contributions to the five systems are \$9.8 billion. The FY 2022 State contributions are estimated to be \$10.6 billion, an increase of \$790.1 million or 8.1% over FY 2021.

TABLE 4

FY 2021 Pension Appropriation by Fund ¹
(\$ in Millions)

System	General Funds	Other State Funds	Total
TRS	\$5,140.7	\$0.0	\$5,140.7
SURS	\$1,780.8	\$215.0	\$1,995.8
SERS	\$1,591.2	\$856.8	\$2,447.9
GARS	\$27.3	\$0.0	\$27.3
JRS	\$148.6	\$0.0	\$148.6
Total	\$8,688.6	\$1,071.8	\$9,760.3

¹ The certified FY 2021 State contributions on the final certification letters of the five pension systems may not be identical to State contributions appropriated by P.A. 101-0637 (FY 2021 appropriation bill). If the appropriated contributions are lower than the final certified contributions, the pension systems could receive the remaining portion via the Continuing Appropriation Act (40 ILCS 15).

FY 2022 Estimated Pension Appropriation by Fund ²
(\$ in Millions)

System	General Funds	Other State Funds	Total ³
TRS	\$5,694.1	\$0.0	\$5,694.1
SURS	\$1,886.3	\$215.0	\$2,101.3
SERS	\$1,673.6	\$901.2	\$2,574.8
GARS	\$27.8	\$0.0	\$27.8
JRS	\$152.4	\$0.0	\$152.4
Total	\$9,434.3	\$1,116.2	\$10,550.4

² This chart is meant to be an estimate only insofar as the FY 2022 appropriation by fund is concerned. The amounts in this chart reflect the State systems' preliminary FY 2022 certification. Also, pursuant to P.A. 97-0694, the State Actuary Law, the State Actuary is required to conduct a review of the systems' actuarial assumptions/methods that are used to perform actuarial valuations and to determine the State contributions. Then, the State Actuary is required to recommend changes in the assumptions/methods before the State systems finalize certifications of the annual State contributions.

³ The SURS "Other State Funds" amount assumes that SURS will receive a FY 2022 appropriation from the State Pension Fund in the same amount that SURS is expected to receive from the State Pension Fund in FY 2021. SURS' historical appropriation from the State Pension Fund varies from year to year.

SERS' FY 2022 estimated appropriation includes a total of \$104.5 million in 2003 POB debt service. Of this amount, according to SERS, \$67.9 million comes from the General Revenue Fund (GRF) and \$36.6 million comes from the other state funds. The SERS appropriation breakdown is based upon a SERS' historical assumption that 65% of the SERS appropriation will come from GRF, while 35% will come from other state funds.

Total FY 2021 Pension Appropriation: \$9,760.3 Million

Total FY 2022 Estimated Pension Appropriation: \$10,550.4 Million

Total Estimated Increase, FY 2022 over FY 2021: \$790.1 Million

Total Estimated GF Increase, FY 2022 over FY 2021: \$745.7 Million

The following pages include pension funding projections for the five State retirement systems based on the respective retirement systems' FY 2020 preliminary actuarial valuations. These projections were generated by the retirement systems' respective actuaries.

FUNDING PROJECTIONS FOR THE STATE RETIREMENT SYSTEMS All Five Systems Combined Projections Based on the Retirement Systems' FY 2020 Preliminary Actuarial Valuations (\$ in Millions)								
Fiscal Year	Annual Payroll	Total State Contribution*	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2021	\$20,721.7	\$9,760.3	47.1%	\$1,574.9	\$242,600.1	\$99,416.1	\$143,184.0	41.0%
2022	\$21,113.8	\$10,550.4	50.0%	\$1,601.7	\$248,606.5	\$103,072.8	\$145,533.7	41.5%
2023	\$21,618.4	\$10,765.4	49.8%	\$1,637.5	\$254,720.7	\$106,652.4	\$148,068.2	41.9%
2024	\$22,138.2	\$11,094.1	50.1%	\$1,674.5	\$260,717.3	\$110,634.5	\$150,082.9	42.4%
2025	\$22,668.7	\$11,423.8	50.4%	\$1,713.1	\$266,559.3	\$115,708.9	\$150,850.3	43.4%
2026	\$23,200.1	\$11,761.4	50.7%	\$1,750.1	\$272,225.2	\$120,945.0	\$151,280.3	44.4%
2027	\$23,740.9	\$12,036.7	50.7%	\$1,788.4	\$277,685.1	\$126,274.4	\$151,410.7	45.5%
2028	\$24,286.9	\$12,290.7	50.6%	\$1,827.5	\$282,926.1	\$131,685.4	\$151,240.8	46.5%
2029	\$24,854.4	\$12,560.8	50.5%	\$1,867.7	\$287,931.1	\$137,201.5	\$150,729.6	47.7%
2030	\$25,434.6	\$12,817.4	50.4%	\$1,908.8	\$292,671.9	\$142,808.2	\$149,863.7	48.8%
2031	\$26,036.4	\$13,091.3	50.3%	\$1,951.9	\$297,136.0	\$148,538.5	\$148,597.5	50.0%
2032	\$26,651.5	\$13,402.4	50.3%	\$1,995.8	\$301,299.0	\$154,441.1	\$146,857.9	51.3%
2033	\$27,280.4	\$13,749.3	50.4%	\$2,039.4	\$305,142.1	\$160,569.7	\$144,572.4	52.6%
2034	\$27,925.3	\$15,120.5	54.1%	\$2,085.6	\$308,651.3	\$168,013.6	\$140,637.7	54.4%
2035	\$28,592.7	\$15,482.1	54.1%	\$2,132.1	\$311,810.4	\$175,828.5	\$135,981.9	56.4%
2036	\$29,282.4	\$15,855.7	54.1%	\$2,181.2	\$314,691.2	\$184,150.7	\$130,540.5	58.5%
2037	\$30,002.8	\$16,247.0	54.2%	\$2,231.3	\$317,219.1	\$192,981.8	\$124,237.3	60.8%
2038	\$30,751.0	\$16,653.5	54.2%	\$2,285.0	\$319,377.8	\$202,384.8	\$116,993.1	63.4%
2039	\$31,519.3	\$17,070.9	54.2%	\$2,338.9	\$321,165.5	\$212,441.6	\$108,723.9	66.1%
2040	\$32,314.8	\$17,503.2	54.2%	\$2,395.3	\$322,592.5	\$223,245.3	\$99,347.2	69.2%
2041	\$33,143.6	\$17,954.0	54.2%	\$2,453.9	\$323,705.7	\$234,936.1	\$88,769.6	72.6%
2042	\$34,006.4	\$18,422.8	54.2%	\$2,514.7	\$324,527.0	\$247,628.2	\$76,898.8	76.3%
2043	\$34,894.4	\$18,905.4	54.2%	\$2,578.2	\$325,107.9	\$261,467.8	\$63,640.1	80.4%
2044	\$35,805.2	\$19,399.2	54.2%	\$2,643.1	\$325,518.9	\$276,615.9	\$48,903.0	85.0%
2045	\$36,741.1	\$19,908.3	54.2%	\$2,710.0	\$325,835.8	\$293,250.9	\$32,585.0	90.0%

* Pursuant to TRS' preliminary FY 2022 certification letter dated October 30, 2020, the FY 2022 required State Contribution includes \$400,000 in minimum benefit reimbursements.

FUNDING PROJECTIONS FOR THE TEACHERS' RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2020 Preliminary Actuarial Valuation
Actuarially Assumed Rate of Return: 7.00%
(\$ in Millions)

Fiscal Year	Annual Payroll	Total State Contribution*	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2021	\$11,214.6	\$5,140.7	45.8%	\$1,009.3	\$139,358.8	\$57,012.9	\$82,345.9	40.9%
2022	\$11,470.4	\$5,694.1	49.6%	\$1,032.3	\$143,162.8	\$59,128.4	\$84,034.4	41.3%
2023	\$11,816.4	\$5,874.5	49.7%	\$1,063.5	\$147,201.7	\$61,249.6	\$85,952.0	41.6%
2024	\$12,165.6	\$6,077.5	50.0%	\$1,094.9	\$151,258.7	\$63,728.0	\$87,530.7	42.1%
2025	\$12,518.4	\$6,309.1	50.4%	\$1,126.7	\$155,316.3	\$67,077.9	\$88,238.4	43.2%
2026	\$12,860.2	\$6,535.4	50.8%	\$1,157.4	\$159,362.0	\$70,615.6	\$88,746.4	44.3%
2027	\$13,202.5	\$6,711.6	50.8%	\$1,188.2	\$163,373.1	\$74,287.7	\$89,085.3	45.5%
2028	\$13,539.2	\$6,871.4	50.8%	\$1,218.5	\$167,331.1	\$78,076.2	\$89,255.0	46.7%
2029	\$13,884.0	\$7,037.9	50.7%	\$1,249.6	\$171,219.8	\$81,988.5	\$89,231.2	47.9%
2030	\$14,234.4	\$7,194.9	50.5%	\$1,281.1	\$175,018.7	\$86,014.0	\$89,004.8	49.1%
2031	\$14,595.5	\$7,360.9	50.4%	\$1,313.6	\$178,706.5	\$90,160.3	\$88,546.2	50.5%
2032	\$14,958.3	\$7,545.6	50.4%	\$1,346.2	\$182,260.0	\$94,446.9	\$87,813.1	51.8%
2033	\$15,323.8	\$7,748.8	50.6%	\$1,379.1	\$185,652.7	\$98,892.4	\$86,760.4	53.3%
2034	\$15,693.3	\$8,665.1	55.2%	\$1,412.4	\$188,864.8	\$104,243.1	\$84,621.7	55.2%
2035	\$16,075.0	\$8,875.9	55.2%	\$1,446.7	\$191,876.4	\$109,830.1	\$82,046.4	57.2%
2036	\$16,471.9	\$9,095.0	55.2%	\$1,482.5	\$194,677.3	\$115,685.1	\$78,992.2	59.4%
2037	\$16,888.8	\$9,325.2	55.2%	\$1,520.0	\$197,251.0	\$121,842.3	\$75,408.7	61.8%
2038	\$17,321.1	\$9,563.9	55.2%	\$1,558.9	\$199,569.1	\$128,327.7	\$71,241.4	64.3%
2039	\$17,762.9	\$9,807.8	55.2%	\$1,598.7	\$201,615.6	\$135,179.8	\$66,435.8	67.0%
2040	\$18,219.0	\$10,059.7	55.2%	\$1,639.7	\$203,379.1	\$142,444.7	\$60,934.4	70.0%
2041	\$18,694.7	\$10,322.4	55.2%	\$1,682.5	\$204,883.6	\$150,207.5	\$54,676.0	73.3%
2042	\$19,192.0	\$10,597.0	55.2%	\$1,727.3	\$206,125.5	\$158,526.7	\$47,598.8	76.9%
2043	\$19,704.1	\$10,879.7	55.2%	\$1,773.4	\$207,134.8	\$167,490.5	\$39,644.3	80.9%
2044	\$20,230.5	\$11,170.4	55.2%	\$1,820.7	\$207,960.5	\$177,206.9	\$30,753.5	85.2%
2045	\$20,776.7	\$11,471.9	55.2%	\$1,869.9	\$208,661.5	\$187,795.3	\$20,866.1	90.0%
2046	\$21,347.7	\$1,145.8	5.4%	\$1,921.3	\$209,304.9	\$188,374.4	\$20,930.5	90.0%

* The minimum benefit reimbursements of \$0.4 million are included both in the State Contributions for FY 2021 and FY 2022.

FUNDING PROJECTIONS FOR THE STATE EMPLOYEES' RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2020 Preliminary Actuarial Valuation
Actuarially Assumed Rate of Return: 6.75%
(\$ in Millions)

Fiscal Year	Annual Payroll	Total State Contribution	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2021	\$4,520.0	\$2,447.9	54.2%	\$256.0	\$51,487.0	\$20,527.0	\$30,960.0	39.9%
2022	\$4,584.0	\$2,574.8	56.2%	\$258.0	\$52,759.0	\$21,530.0	\$31,229.0	40.8%
2023	\$4,654.0	\$2,502.0	53.8%	\$260.0	\$53,966.0	\$22,478.0	\$31,488.0	41.7%
2024	\$4,726.0	\$2,543.0	53.8%	\$262.0	\$55,102.0	\$23,418.0	\$31,684.0	42.5%
2025	\$4,800.0	\$2,584.0	53.8%	\$265.0	\$56,157.0	\$24,410.0	\$31,747.0	43.5%
2026	\$4,881.0	\$2,632.0	53.9%	\$267.0	\$57,124.0	\$25,377.0	\$31,747.0	44.4%
2027	\$4,966.0	\$2,678.0	53.9%	\$270.0	\$58,001.0	\$26,316.0	\$31,685.0	45.4%
2028	\$5,056.0	\$2,721.0	53.8%	\$274.0	\$58,790.0	\$27,229.0	\$31,561.0	46.3%
2029	\$5,155.0	\$2,770.0	53.7%	\$278.0	\$59,496.0	\$28,130.0	\$31,366.0	47.3%
2030	\$5,258.0	\$2,818.0	53.6%	\$282.0	\$60,120.0	\$29,022.0	\$31,098.0	48.3%
2031	\$5,368.0	\$2,871.0	53.5%	\$287.0	\$60,671.0	\$29,922.0	\$30,749.0	49.3%
2032	\$5,482.0	\$2,932.0	53.5%	\$292.0	\$61,141.0	\$30,836.0	\$30,305.0	50.4%
2033	\$5,600.0	\$3,000.0	53.6%	\$296.0	\$61,534.0	\$31,779.0	\$29,755.0	51.6%
2034	\$5,724.0	\$3,318.0	58.0%	\$302.0	\$61,854.0	\$33,022.0	\$28,832.0	53.4%
2035	\$5,854.0	\$3,393.0	58.0%	\$307.0	\$62,103.0	\$34,339.0	\$27,764.0	55.3%
2036	\$5,986.0	\$3,469.0	58.0%	\$313.0	\$62,282.0	\$35,742.0	\$26,540.0	57.4%
2037	\$6,124.0	\$3,549.0	58.0%	\$318.0	\$62,398.0	\$37,251.0	\$25,147.0	59.7%
2038	\$6,269.0	\$3,633.0	58.0%	\$325.0	\$62,460.0	\$38,887.0	\$23,573.0	62.3%
2039	\$6,419.0	\$3,720.0	58.0%	\$331.0	\$62,473.0	\$40,671.0	\$21,802.0	65.1%
2040	\$6,576.0	\$3,811.0	58.0%	\$338.0	\$62,451.0	\$42,628.0	\$19,823.0	68.3%
2041	\$6,739.0	\$3,906.0	58.0%	\$345.0	\$62,405.0	\$44,786.0	\$17,619.0	71.8%
2042	\$6,908.0	\$4,004.0	58.0%	\$352.0	\$62,345.0	\$47,170.0	\$15,175.0	75.7%
2043	\$7,082.0	\$4,105.0	58.0%	\$360.0	\$62,279.0	\$49,808.0	\$12,471.0	80.0%
2044	\$7,260.0	\$4,207.0	57.9%	\$368.0	\$62,218.0	\$52,725.0	\$9,493.0	84.7%
2045	\$7,439.0	\$4,311.0	58.0%	\$376.0	\$62,166.0	\$55,948.0	\$6,218.0	90.0%

Note: Pursuant to P.A. 93-0589, the State Contribution for FY 2021 and FY 2022 include \$99.4 million and \$104.5 million, respectively, for debt service for the 2003 Pension Obligation Bonds authorized by P.A. 93-0002. State contribution amounts shown for FY 2023 - 2045 do not include debt service as these amounts are not known until the annual SERS preliminary certification letters are issued pursuant to P.A. 97-0694 (State Actuary Law).

FUNDING PROJECTIONS FOR THE STATE UNIVERSITIES RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2020 Preliminary Actuarial Valuation
Actuarially Assumed Rate of Return: 6.75%
(\$ in Millions)

Fiscal Year	Annual Payroll*	Total State Contribution**	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2021	\$4,819.585	\$1,995.8	41.4%	\$294.6	\$48,480.2	\$20,624.9	\$27,855.3	42.5%
2022	\$4,892.989	\$2,101.3	42.9%	\$296.4	\$49,366.7	\$21,105.4	\$28,261.2	42.8%
2023	\$4,981.962	\$2,210.0	44.4%	\$299.1	\$50,199.1	\$21,566.0	\$28,633.0	43.0%
2024	\$5,080.891	\$2,295.3	45.2%	\$302.6	\$50,975.1	\$22,084.6	\$28,890.5	43.3%
2025	\$5,184.626	\$2,353.4	45.4%	\$306.4	\$51,685.2	\$22,773.8	\$28,911.4	44.1%
2026	\$5,293.145	\$2,417.1	45.7%	\$310.6	\$52,327.7	\$23,467.3	\$28,860.3	44.8%
2027	\$5,406.414	\$2,470.8	45.7%	\$315.1	\$52,897.8	\$24,154.0	\$28,743.8	45.7%
2028	\$5,525.376	\$2,522.9	45.7%	\$320.0	\$53,397.8	\$24,837.5	\$28,560.3	46.5%
2029	\$5,648.061	\$2,577.5	45.6%	\$325.1	\$53,821.9	\$25,519.1	\$28,302.9	47.4%
2030	\$5,773.801	\$2,629.5	45.5%	\$330.5	\$54,161.0	\$26,191.6	\$27,969.4	48.4%
2031	\$5,903.125	\$2,684.3	45.5%	\$335.9	\$54,414.0	\$26,862.1	\$27,551.9	49.4%
2032	\$6,039.836	\$2,748.8	45.5%	\$341.7	\$54,587.8	\$27,552.8	\$27,035.0	50.5%
2033	\$6,183.587	\$2,822.6	45.6%	\$347.8	\$54,685.4	\$28,281.8	\$26,403.6	51.7%
2034	\$6,332.784	\$2,950.3	46.6%	\$354.2	\$54,708.2	\$29,112.9	\$25,595.3	53.2%
2035	\$6,486.230	\$3,024.0	46.6%	\$360.8	\$54,656.7	\$30,002.2	\$24,654.5	54.9%
2036	\$6,644.488	\$3,100.0	46.7%	\$367.6	\$54,611.4	\$31,041.1	\$23,570.3	56.8%
2037	\$6,807.163	\$3,178.1	46.7%	\$374.6	\$54,506.7	\$32,175.4	\$22,331.2	59.0%
2038	\$6,975.119	\$3,258.8	46.7%	\$381.9	\$54,344.9	\$33,420.0	\$20,924.9	61.5%
2039	\$7,148.364	\$3,342.0	46.8%	\$389.4	\$54,134.3	\$34,795.6	\$19,338.7	64.3%
2040	\$7,327.371	\$3,427.9	46.8%	\$397.2	\$53,882.0	\$36,322.8	\$17,559.3	67.4%
2041	\$7,513.880	\$3,517.4	46.8%	\$405.5	\$53,598.7	\$38,026.5	\$15,572.2	70.9%
2042	\$7,706.500	\$3,609.7	46.8%	\$414.0	\$53,299.3	\$39,936.4	\$13,362.9	74.9%
2043	\$7,904.557	\$3,704.6	46.9%	\$422.8	\$52,996.4	\$42,080.4	\$10,916.0	79.4%
2044	\$8,106.900	\$3,801.5	46.9%	\$431.8	\$52,700.2	\$44,485.1	\$8,215.0	84.4%
2045	\$8,313.292	\$3,900.4	46.9%	\$441.0	\$52,422.7	\$47,180.4	\$5,242.3	90.0%

* Payroll projections include SMP payroll. 30% of new SURS members are assumed to enter SMP.

** State Contribution Only. Includes Self-Managed Plan (SMP) Contributions.

FUNDING PROJECTIONS FOR THE JUDGES' RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2020 Preliminary Actuarial Valuation
Actuarially Assumed Rate of Return: 6.50%
(\$ in Millions)

Fiscal Year	Annual Payroll	Total State Contribution	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2021	\$157.7	\$148.6	94.2%	\$13.9	\$2,901.3	\$1,182.1	\$1,719.3	40.7%
2022	\$156.6	\$152.4	97.3%	\$13.9	\$2,947.0	\$1,234.6	\$1,712.4	41.9%
2023	\$156.6	\$151.7	96.9%	\$13.8	\$2,985.2	\$1,280.1	\$1,705.1	42.9%
2024	\$156.4	\$151.8	97.0%	\$13.9	\$3,016.2	\$1,321.7	\$1,694.5	43.8%
2025	\$156.6	\$151.6	96.8%	\$14.0	\$3,039.2	\$1,362.2	\$1,677.0	44.8%
2026	\$156.8	\$151.3	96.5%	\$14.1	\$3,054.6	\$1,397.6	\$1,657.0	45.8%
2027	\$157.2	\$151.4	96.3%	\$14.1	\$3,061.3	\$1,427.4	\$1,633.9	46.6%
2028	\$157.5	\$150.9	95.8%	\$13.9	\$3,060.9	\$1,452.0	\$1,609.0	47.4%
2029	\$158.6	\$151.3	95.4%	\$14.0	\$3,053.4	\$1,472.4	\$1,581.0	48.2%
2030	\$159.7	\$151.3	94.7%	\$14.3	\$3,039.0	\$1,488.7	\$1,550.3	49.0%
2031	\$161.1	\$151.7	94.2%	\$14.4	\$3,018.4	\$1,501.7	\$1,516.7	50.3%
2032	\$162.8	\$153.1	94.0%	\$14.9	\$2,991.4	\$1,512.9	\$1,478.5	50.6%
2033	\$164.5	\$155.0	94.2%	\$15.5	\$2,958.9	\$1,523.7	\$1,435.2	51.5%
2034	\$166.5	\$162.3	97.5%	\$16.0	\$2,921.3	\$1,540.5	\$1,380.9	52.7%
2035	\$168.9	\$164.6	97.5%	\$16.6	\$2,879.6	\$1,559.3	\$1,320.3	54.1%
2036	\$171.4	\$167.1	97.5%	\$17.1	\$2,834.1	\$1,581.2	\$1,252.9	55.8%
2037	\$174.1	\$169.7	97.5%	\$17.7	\$2,785.5	\$1,607.3	\$1,178.2	57.7%
2038	\$177.0	\$172.5	97.5%	\$18.3	\$2,734.5	\$1,638.9	\$1,095.6	59.9%
2039	\$180.1	\$175.6	97.5%	\$18.8	\$2,681.8	\$1,677.4	\$1,004.4	62.5%
2040	\$183.5	\$178.8	97.5%	\$19.3	\$2,628.1	\$1,724.1	\$904.0	65.6%
2041	\$186.9	\$182.2	97.5%	\$19.9	\$2,574.4	\$1,780.7	\$793.8	69.2%
2042	\$190.6	\$185.8	97.5%	\$20.4	\$2,521.4	\$1,848.6	\$672.8	73.3%
2043	\$194.5	\$189.5	97.5%	\$20.9	\$2,469.7	\$1,929.4	\$540.3	78.1%
2044	\$198.4	\$193.4	97.5%	\$21.4	\$2,419.9	\$2,024.4	\$395.4	83.7%
2045	\$202.5	\$197.4	97.5%	\$22.0	\$2,372.6	\$2,135.3	\$237.3	90.0%

FUNDING PROJECTIONS FOR THE GENERAL ASSEMBLY RETIREMENT SYSTEM
Projections Based on the Retirement System's FY 2020 Preliminary Actuarial Valuation
Actuarially Assumed Rate of Return: 6.50%
(\$ in Millions)

Fiscal Year	Annual Payroll	Total State Contribution	State Contribution as a % of Payroll	Total Employee Contribution	Accrued Liabilities	Actuarial Value of Assets	Unfunded Liabilities	Funded Ratio
2021	\$9.8	\$27.3	278.0%	\$1.1	\$372.8	\$69.3	\$303.5	18.6%
2022	\$9.7	\$27.8	285.9%	\$1.1	\$371.1	\$74.4	\$296.7	20.0%
2023	\$9.5	\$27.2	285.1%	\$1.1	\$368.7	\$78.7	\$290.0	21.3%
2024	\$9.3	\$26.5	285.1%	\$1.1	\$365.4	\$82.2	\$283.2	22.5%
2025	\$9.1	\$25.8	283.3%	\$1.1	\$361.5	\$85.0	\$276.5	23.5%
2026	\$9.0	\$25.5	282.2%	\$1.0	\$357.0	\$87.5	\$269.5	24.5%
2027	\$8.9	\$24.9	280.6%	\$1.0	\$351.9	\$89.3	\$262.6	25.4%
2028	\$8.8	\$24.5	278.6%	\$1.0	\$346.3	\$90.7	\$255.6	26.2%
2029	\$8.7	\$24.1	276.5%	\$1.0	\$340.0	\$91.6	\$248.4	26.9%
2030	\$8.6	\$23.6	273.4%	\$1.0	\$333.3	\$92.0	\$241.3	27.6%
2031	\$8.6	\$23.4	270.9%	\$1.0	\$326.2	\$92.4	\$233.8	28.3%
2032	\$8.5	\$23.0	269.3%	\$1.0	\$318.8	\$92.5	\$226.3	29.0%
2033	\$8.5	\$23.0	269.6%	\$1.0	\$311.0	\$92.8	\$218.2	29.8%
2034	\$8.6	\$24.7	286.4%	\$1.0	\$303.0	\$95.2	\$207.8	31.4%
2035	\$8.6	\$24.7	286.4%	\$1.0	\$294.8	\$98.0	\$196.8	33.2%
2036	\$8.6	\$24.6	286.5%	\$1.0	\$286.4	\$101.4	\$185.0	35.4%
2037	\$8.7	\$24.9	286.5%	\$1.0	\$277.9	\$105.7	\$172.2	38.0%
2038	\$8.8	\$25.2	286.4%	\$1.0	\$269.3	\$111.1	\$158.2	41.3%
2039	\$8.9	\$25.5	286.4%	\$1.0	\$260.8	\$117.8	\$143.0	45.2%
2040	\$9.0	\$25.8	286.3%	\$1.0	\$252.3	\$125.8	\$126.5	49.9%
2041	\$9.1	\$26.1	286.6%	\$1.1	\$244.0	\$135.4	\$108.6	55.5%
2042	\$9.2	\$26.3	286.5%	\$1.1	\$235.9	\$146.6	\$89.3	62.1%
2043	\$9.3	\$26.6	286.5%	\$1.1	\$228.0	\$159.5	\$68.5	70.0%
2044	\$9.4	\$26.9	286.4%	\$1.1	\$220.4	\$174.4	\$46.0	79.1%
2045	\$9.6	\$27.6	286.5%	\$1.1	\$213.1	\$191.8	\$21.3	90.0%