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PERS
of MISSISSIPPI

Report on the Annual Valuation of the Mississippi Highway Safety Patrol Retirement System

Prepared as of June 30, 2022

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

November 1, 2022

Board of Trustees
Public Employees' Retirement System of Mississippi
429 Mississippi Street
Jackson, MS 39201-1005

Ladies and Gentlemen:

Presented in this report are the results of the annual actuarial valuation of the Mississippi Highway Safety Patrol Retirement System (HSPRS). The purpose of the valuation is to measure the System's funding progress and to determine the unfunded actuarial accrued liability amortization period beginning July 1, 2022. The results may not be applicable for other purposes.

The date of the valuation was June 30, 2022.

The valuation was based upon data, furnished by the Executive Director and the PERS staff, concerning active, inactive and retired members along with pertinent financial information. While not verifying data at the source, the actuary performed tests for consistency and reasonableness. The complete cooperation of the PERS staff in furnishing materials requested is hereby acknowledged with appreciation.

Your attention is directed particularly to the presentation of results on page 1 and the comments on page 9. As the projections of this System show improved funded ratio and reasonable negative cash flow outcomes over the next 30 years, we recommend to the PERS Board that the Fixed Contribution Rate (FCR) continue at a rate of 49.08% of annual compensation for HSPRS beginning July 1, 2024.

Since the previous valuation, Senate Bill 2120 was passed by the Mississippi Legislation that increased the payroll scale for all levels of the Highway Safety Patrol. In addition, the administrative expense load has been updated from 0.28% to 1.00% and some minor changes to the valuation were made in conjunction with the actuarial audit performed this year.

The valuation was prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board. We have reviewed the actuarial methods, including the asset valuation method, and continue to believe they are appropriate for the purpose of determining employer contribution levels.

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In order to prepare the results in this report, we have utilized actuarial models that were developed to measure liabilities and develop actuarial costs. These models include tools that we have produced and tested, along with commercially available valuation software that we have reviewed to confirm the appropriateness and accuracy of the output. In utilizing these models, we develop and use input parameters and assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

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 system's funded status); and changes in plan provisions or applicable law. An analysis of the potential range of future measurements is provided in Section X of this report.

This actuarial valuation was performed to determine the adequacy of the Board approved contribution rate to fund the plan. The asset values used to determine unfunded liabilities and funded ratios are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts and funded ratios using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in this report cannot be used to assess a settlement of the obligation.

To the best of our knowledge, this report is complete and accurate. The valuation was performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems. The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the system, and on actuarial assumptions that are, in the aggregate, internally consistent and reasonably based on the actual experience of the system.

Respectfully submitted,

Edward J. Koebel

Ben Mobley

Edward J. Koebel, FCA, EA, MAAA
Chief Executive Officer

Ben D. Mobley, ASA, FCA, MAAA
Consulting Actuary

Table of Contents

Section I: Executive Summary

1. This report, prepared as of June 30, 2022, presents the results of the annual actuarial valuation of the System. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below. The current valuation and reported benefits amount reflect any benefit increases granted to retirees as of July 1, 2022. Based on the funding policy adopted by the PERS Board, the PERS Board and the HSPRS Administrative Board adopted an employer contribution rate of 49.08% of annual compensation effective July 1, 2018 and the amortization period is to be calculated on an open basis.

VALUATION DATE	June 30, 2022	June 30, 2021
Investment Return Assumption	**7.55%**	**7.55%**
Active members included in valuation		
Number	478	478
Annual compensation	$ 33,758,750	$ 29,780,428
Retirees		
Number	785	761
Annual allowances	$ 37,420,188	$ 35,443,890
Assets		
Market related actuarial value	$ 419,219,000	$ 403,748,000
Market value of assets (MVR)	$ 405,372,000	$ 463,984,000
Unfunded actuarial accrued liability (UAAL)	$ 184,865,201	$ 169,385,895
Funded Ratio on an actuarial value basis	69.4%	70.4%
Employer Fixed Contribution Rate (FCR)		
Normal Cost*	16.06%	16.29%
Accrued liability	33.02	32.79
Total	49.08%	49.08%
Payment period based on the FCR	19.9 years	21.0 years
Unfunded actuarial accrued liability based on MVA	$ 198,712,201	$ 109,149,895
Funded Ratio on a market value basis	67.1%	81.0%
Payment period based on the FCR	22.7 years	7.1 years

* Includes load for administrative expenses. See Section VI for more contribution rate detail.

Section I: Executive Summary

2. The valuation balance sheet showing the results and liabilities of the valuation is given in Section III.

3. Comments on the valuation results are provided in Section IV, the derivation of the experience gains and losses during the valuation year are provided in Section V and the rates of contribution payable by employers are provided in Section VI.

4. Due to Senate Bill No. 2659 enacted in 2004 and House Bill No. 1015 enacted April 25, 2013, additional contributions, classified as Motor Vehicle Replacement (MVR) fees are being made to the System and are expected to continue in the future. For the 2022 fiscal year, the total additional fees were $3,501,000. We have lowered our expected contributions from these sources from $3,700,000 to $3,600,000 based on the average of actual monies received over the past three fiscal years and the expectation from these sources in the future. The employers are also required to contribute the employer contribution rate as determined based on the funding policy. The funding period of the UAAL of 19.9 years shown on the previous page reflects the additional contributions from Senate Bill No. 2659 and House Bill No. 1015. Without these additional contributions, the funding period would have been 30.6 years on the current employer rate basis. If the funding period was kept at 30 years, without the additional contributions the employer contribution rate would have been 49.37%.

5. Schedule A of this report presents the development of the actuarial value of assets. The estimated investment return for the plan year ending June 30, 2022 on a market value basis was (8.69)% and on an actuarial value of assets basis was 8.78%. These can be compared to the assumed rate of return for the period of 7.55%.

6. Schedule B details the actuarial assumptions and methods employed. Since the previous valuation, the administrative expense load has been updated from 0.28% to 1.00% and some minor changes to the valuation were made in conjunction with the actuarial audit performed this year.

7. Schedule C gives a summary of the benefit and contribution provision of the System. There have been no changes since the previous valuation. However, Senate Bill 2120 was passed by the Mississippi Legislation that increased the payroll scale for all levels of the Highway Safety Patrol.

8. The funding policy for the System was changed in 2012. Under the prior funding policy, the amortization payment for the UAAL was calculated based on a fixed employer contribution rate using a floating amortization period no greater than 30 years. For continuity and informational purposes, we have provided this calculation in Section VII.

9. The funded ratio shown in the Summary of Principal Results, is the ratio of actuarial value of assets to the actuarial accrued liability. The funded status would be different based on the market value of assets. The funded ratio is an indication of progress in funding the promised benefits. Since the ratio is less than 100%, there is a need for additional contributions toward the payment of the unfunded accrued liability. In addition, this funded ratio does not have any relationship to measuring the sufficiency if the plan had to settle its liabilities.

10. The projection results, shown beginning in Section VIII, allow the Board to see a forecast of the System's funding progress over time, allow the Board to review the funding goals and benchmarks outlined in the funding policy, and provide the status of the metrics/targets in the Funding Policy that determines whether or not a contribution rate increase should be recommended. The objective of the current funding policy is to accumulate sufficient assets during a member's employment to fully finance the benefit the member receives throughout retirement. In order to reach that objective, some goals and benchmarks were established as follows:

    - To maintain an increasing ratio of system assets to accrued liabilities and reach an 80 percent minimum funded ratio in 2042;
    - To maintain adequate asset levels to finance the benefits promised to members;
    - To develop a pattern of stable contribution rates when expressed as a percentage of member payroll as measured by valuations prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, with a minimum employer contribution equal to the normal cost determined under the Entry Age Normal funding method;
    - To provide intergenerational equity for taxpayers with respect to system costs; and
    - To fund benefit improvements through increases in contribution rates in accordance with Article 14, § 272A, of the Mississippi Constitution.

Section I: Executive Summary

11. Utilizing the metrics based on the funding policy for PERS and with a fixed contribution rate as a percentage of annual compensation of 49.08% of payroll, the projection results for 2022 for HSPRS show that the Plan will have a “Green Light” status for all metrics. **Therefore, we recommend to the PERS Board that the Fixed Contribution Rate (FCR) continue at a rate of 49.08% of annual compensation for HSPRS beginning July 1, 2024.**

Metrics	2022 Projection with 49.08% FCR (2022%)	2022 Status
Funding Ratio in 2042	90.6%	Green
Cash Flow as a Percentage of Assets	-4.1%	Green
ADC/FCR Ratio from 2022 Valuation	86.8%	Green
ADC/FCR Ratio from 2023 Valuation	84.8%	Green

12. The table on the following page provides a ten-year history of some pertinent figures.

Section I: Executive Summary

Comparative Schedule

Valuation Date June 30	Active Members: Number	Active Members: Payroll ($ in thousands)	Active Members: Average Salary	Active Members: % increase from previous year	Retired Lives: Number	Retired Lives: Active/ Retired Ratio	Retired Lives: Annual Benefits ($ thousands)	Retired Lives: Benefits as % of Payroll	Valuation Results ($ thousands): Accrued Liability	Valuation Results ($ thousands): Valuation Assets	Valuation Results ($ thousands): UAAL
2013	520	$25,816	$49,646	5.8%	713	0.7	$25,835.6	100.1%	$431,575	$271,097	$160,478
2014	495	25,554	51,624	4.0	720	0.7	26,966.4	105.5	445,822	295,298	150,524
2015	518	25,505	49,237	(4.6)	724	0.7	28,076.5	110.1	477,803	316,149	161,654
2016	484	27,380	56,571	14.9	724	0.7	28,782.0	105.1	494,101	324,894	169,207
2017	470	28,845	61,373	8.5	726	0.6	29,563.8	102.5	497,992	339,114	158,878
2018	511	29,555	57,838	(5.8)	725	0.7	30,614.5	103.6	527,428	352,415	175,013
2019	522	31,811	60,941	5.4	734	0.7	31,814.9	100.0	541,925	362,591	179,334
2020	511	32,346	63,299	3.9	740	0.7	33,344.1	103.1	561,662	373,511	188,151
2021	478	29,780	62,302	(1.6)	761	0.6	35,443.9	119.0	573,134	403,748	169,386
2022	478	33,759	70,625	13.4	785	0.6	37,420.2	110.8	604,084	419,219	184,865

Section II: Membership Data

Data regarding the membership of the System for use as a basis for the valuation were furnished by the System's office. The following tables summarize the membership of the System as of June 30, 2022 upon which the valuation was based. Detailed tabulations of the data are given in Schedule D.

Active Members

				Group Averages		
Employers	Number of Employers	Number	Payroll	Salary	Age	Benefit Service
State Agencies	1	478	$ 33,758,750	$70,625	41.1	12.2

Of the 478 active members, 320 are vested and 158 are non-vested.

Retired Lives

			Group Averages	
Type of Benefit Payment	No.	Annual Benefits	Benefit	Age
Retirement	591	$32,229,880	$54,534	67.8
Disability	13	347,020	26,694	66.0
Survivor	181	4,843,288	26,758	73.8
Total in HSPRS	785	$37,420,188	$47,669	69.2

Deferred Vested/Inactive Lives

Type of Member	No.	Deferred Benefits	Outstanding Balance
Deferred Vested – Benefit Included	42	$688,516	N/A
Inactive	24	N/A	$189,341
Total in HSPRS	66	$688,516	$189,341

For the liability in this valuation, deferred vested participants with benefits provided are valued assuming a retirement age of 55 and for inactive members, account balances are multiplied by two to estimate liabilities and interest in the future.

Section III: Valuation Balance Sheet

The following valuation balance sheet shows the assets and liabilities of the retirement system as of the current valuation date of June 30, 2022 and, for comparison purposes, as of the immediately preceding valuation date of June 30, 2021. The items shown in the balance sheet are present values actuarially determined as of the relevant valuation date. The development of the actuarial value of assets is presented in Schedule A.

Section III: Valuation Balance Sheet

VALUATION BALANCE SHEET
SHOWING THE ASSETS AND LIABILITIES OF THE
MISSISSIPPI HIGHWAY SAFETY PATROL RETIREMENT SYSTEM

	JUNE 30, 2022	JUNE 30, 2021
ASSETS		
Current actuarial value of assets:		
Annuity Savings Account	$ 23,950,718	$ 24,844,307
Annuity Reserve	50,372,349	46,621,071
Employers' Accumulation Account	344,895,933	332,282,622
Total current assets	$ 419,219,000	$ 403,748,000
Future member contributions to Annuity Savings Account	$ 21,756,251	$ 18,258,055
Prospective contributions to Employer's Accumulation Account		
Normal contributions	$ 45,802,044	$ 40,318,822
Unfunded actuarial accrued liability contributions	184,865,201	169,385,895
Total prospective contributions	$ 230,667,245	$ 209,704,717
Total assets	$ 671,642,496	$ 631,710,772
LIABILITIES		
Present value of benefits payable on account of present retired members and beneficiaries	$ 442,965,246	$ 417,468,199
Present value of benefits payable on account of inactive members for service rendered before the valuation date	6,591,320	11,260,140
Present value of benefits payable on account of active members	$ 222,085,930	$ 202,982,433
Total liabilities	$ 671,642,496	$ 631,710,772

Section III: Valuation Balance Sheet

BREAKDOWN OF TOTAL AND ACCRUED LIABILITIES
AS OF JUNE 30, 2022

	Total Liability	Accrued Liability
Active Members		
Retirement	$ 211,085,481	$ 153,284,832
Death	3,401,201	416,123
Disability	1,496,051	142,340
Termination	6,103,197	684,340
Total	$ 222,085,930	$ 154,527,635
Retirees		
Retirement	$ 398,609,982	$ 398,609,982
Survivor	40,830,231	40,830,231
Disability	3,525,033	3,525,033
Total	$ 442,965,246	$ 442,965,246
Deferred Vested Members	6,212,638	6,212,638
Inactive Members	378,682	378,682
Total Actuarial Values	$ 671,642,496	$ 604,084,201
Actuarial Value of Assets		419,219,000
Unfunded Actuarial Accrued Liability		$ 184,865,201

The total liability is the present value of future benefits for all current members as of the valuation date. The accrued liability is the present value of benefits that have been accrued as of the valuation date. Since all inactive members and retirees have accrued their full benefits, the total liability and accrued liability are the same. For actives, the difference between the total liability and the accrued liability is the present value of all future accruals.

Section IV: Comments on Valuation

The valuation balance sheet gives the following information with respect to the funds of the System as of June 30, 2022.

Total Assets

The Annuity Savings Account is the fund to which are credited contributions made by members together with interest thereon. When a member retires, the amount of his or her accumulated contributions is transferred from the Annuity Savings Account to the Annuity Reserve. The Employer's Accumulation Account is the fund to which are credited employer contributions and investment income, and from which are paid all employer-provided benefits under the system. The assets credited to the Annuity Savings Account as of the valuation date, which represent the accumulated contributions of members to that date, amounted to $23,950,718. The assets credited to the Annuity Reserve were $50,372,349 and the assets credited to the Employer's Accumulation Account totaled $344,895,933. Current actuarial assets as of the valuation date equaled the sum of these three funds, $419,219,000. Future member contributions to the Annuity Savings Account were valued to be $21,756,251. Prospective contributions to the Employer's Accumulation Account were calculated to be $230,667,245 of which $45,802,044 is attributable to service rendered after the valuation date (normal contributions) and $184,865,201 is attributable to service rendered before the valuation date (unfunded actuarial accrued liability contributions).

Therefore, the balance sheet shows the present value of current and future assets of the System to be $671,642,496 as of June 30, 2022.

Total Liabilities

The present value of benefits payable on account of presently retired members and beneficiaries totaled $442,965,246 as of the valuation date. The present value of future benefit payments on behalf of active members amounted to $222,085,930. In addition, the present value of benefits for inactive members, due to service rendered before the valuation date, was calculated to be $6,591,320.

Therefore, the balance sheet shows the present value for all prospective benefit payments under the System to be $671,642,496 as of June 30, 2022.

Section 25-11-7 of State law requires that active members contribute the current rate of 7.25% of annual compensation to the System.

Section 25-11-123(c) requires that the State contribute a certain percentage of the annual compensation of members to cover the normal contributions and a certain percentage to cover the accrued liability contributions of the System. These individual contribution percentages are established in accordance with an actuarial valuation. Based on the funding policy adopted by the PERS Board, the PERS Board and the MHSPRS Administrative Board adopted an employer contribution rate of 49.08% of annual compensation effective July 1, 2018 and the amortization period is to be calculated on an open basis. The amortization period for the June 30, 2022 valuation is 19.9 years, compared to 21.0 years for the previous valuation. See page 12 for a reconciliation of the amortization period.

See Schedule E for a complete analysis of the Financial Experience.

Section V: Derivation of Experience Gains & Losses

Actual experience will never (except by coincidence) match exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year to year fluctuations are common. Details on the derivation of the experience gain/(loss) for the years ended June 30, 2022 and June 30, 2021 are shown below.

		2022 Valuation $ Thousands	2021 Valuation $ Thousands
(1)	UAAL* as of beginning of year	$ 169,385.9	$ 188,151.3
(2)	Total normal cost from last valuation	7,213.4	7,643.1
(3)	Total contributions	21,832.0	21,940.0
(4)	Interest Rate (Beginning of Year)	7.55%	7.75%
(5)	Interest accrual: [[(1) + (2)] x (4)] - [(3) x ((4) / 2)]	12,509.1	14,323.9
(6)	Expected UAAL before changes: (1) + (2) – (3) + (5)	$ 167,276.4	$ 188,178.3
(7)	Change due to plan amendments	13,327.6	0.0
(8)	Change due to actuarial assumptions or methods	0.0	2,545.6
(9)	Expected UAAL after changes: (6) + (7) + (8)	$ 180,604.0	$ 190,723.9
(10)	Actual UAAL as of end of year	$ 184,865.2	$ 169,385.9
(11)	Gain/(loss): (9) – (10)	$ (4,261.2)	$ 21,338.0
(12)	Gain/(loss) as percent of actuarial accrued liabilities at start of year.	(0.7)%	3.8%

*Unfunded actuarial accrued liability.

Valuation Date June 30	Actuarial Gain/(Loss) as a % of Beginning Accrued Liabilities
2017	1.9%
2018	(2.9)
2019	(0.6)
2020	(1.9)
2021	3.8
2022	(0.7)

Section VI: Fixed Contribution Rates

The valuation balance sheet gives the basis for determining the percentage rates for contributions to be made by employers to the Retirement System. The following table shows the rates of contribution payable by employers as determined from the present valuation and a comparison to the previous valuation results.

Contribution for	2022 Valuation	2021 Valuation
Total Normal Cost:		
Service retirement benefits	20.93%	21.76%
Disability benefits	0.44	0.48
Survivor benefits	0.94	1.02
Total	22.31%	23.26%
Less Member Contributions:	7.25%	7.25%
Employer Normal Cost	15.06%	16.01%
Administrative Expense Load	1.00%	0.28%
Total Employer Normal Cost Rate	16.06%	16.29%
Unfunded Actuarial Accrued Liabilities (19.9 year level % of payroll amortization*)	33.02%	32.79%
Total Employer Fixed Contribution Rate (FCR)	49.08%	49.08%

* Amortization period a year ago was 21.0 years.

The current funding policy has set the employer contribution rate to 49.08% of payroll and kept the amortization period to open-ended. Thirty-year projections are completed after the valuation to determine if an increase or decrease in the employer contribution rate is warranted according to the triggers set forth in the funding policy. Please see Schedule F for the current funding policy.

Section VI: Fixed Contribution Rates

The components of the change in the computed unfunded actuarial accrued liability amortization period from 21.0 years to 19.9 years are as follows:

Previously Reported Period	21.0 years
Change due to:	
Normal amortization	(1.0)
Actuarial experience	0.8
MVR fee assumption change	0.3
Plan Amendment changes	(0.6)
Contribution Shortfall/(Excess)	(0.6)
Computed Period	19.9 years

The table below shows the development of the amortization period of 19.9 years ($ in thousands):

Year	UAAL BOY	Amortization Payment	MVR Fees	UAAL EOY
1	$184,865	$11,613	$3,600	$183,168
2	183,168	11,921	3,600	181,027
3	181,027	12,237	3,600	178,399
4	178,399	12,561	3,600	175,241
5	175,241	12,894	3,600	171,502
6	171,502	13,236	3,600	167,130
7	167,130	13,587	3,600	162,068
8	162,068	13,947	3,600	156,255
9	156,255	14,316	3,600	149,623
10	149,623	14,696	3,600	142,101
11	142,101	15,085	3,600	133,611
12	133,611	15,485	3,600	124,070
13	124,070	15,895	3,600	113,387
14	113,387	16,317	3,600	101,465
15	101,465	16,749	3,600	88,200
16	88,200	17,193	3,600	73,477
17	73,477	17,648	3,600	57,175
18	57,175	18,116	3,600	39,162
19	39,162	18,596	3,600	19,297
20	19,297	19,089	3,600	(2,575)

Section VII: Supplemental Disclosure Information

1. The following supplemental disclosure information is provided for informational purposes only. One such item is a distribution of the number of employees by type of membership, as follows:

NUMBER OF ACTIVE AND RETIRED PARTICIPANTS
AS OF JUNE 30, 2022

GROUP	NUMBER
Retired participants and beneficiaries currently receiving benefits	785
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	66
Active Participants	478
Total	1,329

Section VII: Supplemental Disclosure Information

2. Another such item is the schedule of funding progress as shown below. As can be seen in the table below, the funded ratio has in a narrow range over the past 10 years, with increases and decreases throughout this period. Since the Highway Safety Patrol fluctuates with its active member counts and annual covered compensation from year to year, the UAAL as a percentage of payroll, shown in column 6, experiences more volatility from year to year than other PERS plans.

SCHEDULE OF FUNDING PROGRESS
($ Thousands)

Plan Year Ended	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability (AAL) Entry Age	(3) Percent Funded (1)/(2)	(4) Unfunded AAL (2) – (1)	(5) Annual Covered Payroll	(6) Unfunded AAL as a Percentage of Covered Payroll (4)/(5)
06/30/2013#	$271,097	$431,575	62.8%	$160,478	$25,816	621.6%
06/30/2014	295,298	445,822	66.2	150,524	25,554	589.0
06/30/2015#	316,149	477,803	66.2	161,654	25,505	633.8
06/30/2016	324,894	494,101	65.8	169,207	27,380	618.0
06/30/2017#	339,114	497,992	68.1	158,878	28,845	550.8
06/30/2018	352,415	527,428	66.8	175,013	29,555	592.2
06/30/2019#	362,591	541,925	66.9	179,334	31,811	563.7
06/30/2020	373,511	561,662	66.5	188,151	32,346	581.7
06/30/2021#	403,748	573,134	70.4	169,386	29,780	568.8
06/30/2022	419,219	604,084	69.4	184,865	33,759	547.6

After change in actuarial assumptions.

Section VII: Supplemental Disclosure Information

3. Under the prior funding policy, the amortization payment of the unfunded actuarial accrued liability rate was calculated based on a fixed employer contribution rate using a floating amortization period no greater than 30 years. The calculation of this amount for the past two valuations is shown below for informational purposes only:

Prior Funding Policy		
Valuation Date June 30	**2022**	**2021**
Employer contribution rate		
Normal Cost*	16.06%	16.29%
Accrued liability	24.72	24.60
Total	40.78%	40.89%
Anticipated accrued liability payment period	30 years	30 years

* Includes load for administrative expenses. See Section VI for more contribution rate detail.

Solvency Tests
($ in Thousands)

	Actuarial Accrued Liabilities for				Portions of Accrued Liabilities Covered by Assets		
Valuation Date	(1) Accumulated Employee Contributions Including Allocated Investment Earnings	(2) Retirees and Beneficiaries Currently Receiving Benefits	(3) Active and Inactive Members Employer Financed Portion	Net Assets Available for Benefits	(1)	(2)	(3)
6/30/2013	$23,706	$306,273	$101,596	$271,097	100%	80.8%	0.0%
6/30/2014	24,411	317,825	103,586	295,298	100	85.2	0.0
6/30/2015	24,827	338,459	114,517	316,149	100	86.1	0.0
6/30/2016	25,791	343,635	124,675	324,894	100	87.0	0.0
6/30/2017	26,922	349,850	121,219	339,114	100	89.2	0.0
6/30/2018	27,581	358,342	141,507	352,415	100	90.6	0.0
6/30/2019	27,244	372,526	142,154	362,591	100	90.0	0.0
6/30/2020	26,382	389,269	146,011	373,511	100	89.2	0.0
6/30/2021	24,844	417,468	130,821	403,748	100	90.8	0.0
6/30/2022	23,951	442,965	137,169	419,219	100	89.2	0.0

As can be seen from the table above, the HSPRS plan assets currently cover 100% of the active member contribution account balances as of the valuation date but only cover about 89.2% of the retiree liability. There remains zero assets to cover any employer financed active liabilities.

Section VII: Supplemental Disclosure Information

Schedule of Active Member Valuation Data

		Active Members			
Valuation Date	Number of Employers	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2013	1	520	$25,815,787	$49,646	5.8%
2014	1	495	25,553,765	51,624	4.0
2015	1	518	25,504,676	49,237	(4.6)
2016	1	484	27,380,162	56,571	14.9
2017	1	470	28,845,478	61,373	8.5
2018	1	511	29,555,411	57,838	(5.8)
2019	1	522	31,811,231	60,941	5.4
2020	1	511	32,345,730	63,299	3.9
2021	1	478	29,780,428	62,302	(1.6)
2022	1	478	33,758,750	70,625	13.4

Schedule of Number of Retirants Added To and Removed From Rolls
Last Ten Fiscal Years

	Fiscal Year Ended June 30									
Item	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Beginning of Year	713	713	720	724	724	726	725	734	740	761
Added	23	28	22	26	22	17	28	21	39	35
Removed	(23)	(21)	(18)	(26)	(20)	(18)	(19)	(15)	(18)	(11)
End of Year	713	720	724	724	726	725	734	740	761	785

*See Schedule D for a breakdown by type of retirement.

Schedule of Benefit Payments Added To and Removed From Rolls
Last Seven Fiscal Years

Year Ending	2016	2017	2018	2019	2020	2021	2022
Beginning of Year	$28,076,536	$28,782,015	$29,563,842	$30,614,457	$31,814,897	$33,344,108	$35,443,890
Added	833,870	717,225	787,728	1,186,864	1,202,084	2,196,435	2,117,341
Removed	(830,278)	(694,187)	(494,512)	(812,457)	(613,918)	(1,029,029)	(1,072,205)
Benefit increase due to annual COLA	701,887	758,789	757,399	826,033	941,045	932,376	931,161
Benefit increase due to plan amendments	0	0	0	0	0	0	0
End of Year	$28,782,015	$29,563,842	$30,614,457	$31,814,897	$33,344,108	$35,443,890	$37,420,188

Section VII: Supplemental Disclosure Information

Schedule of Average Benefit Payments

	Years of Credited Service								
	0-9	10-14	15-19	20-24	25	26-29	30	31+	TOTAL
July 1, 2021 to June 30, 2022									
Average Monthly Benefit			$2,755.98	$3,826.83	$4,384.68	$5,445.38		$5,345.90	$4,418.34
Average Final Salary			$68,698.46	$54,434.52	$54,702.08	$77,452.96		$84,017.5	$67,728.47
Number of Active Retirants			6	8	6	10		5	35
July 1, 2020 to June 30, 2021									
Average Monthly Benefit		$2,073.24	$2,071.18	$3,751.11	$5,041.93	$4,935.28	$4,757.01	$6,336.18	$4,693.24
Average Final Salary		$63,446.28	$85,505.28	$46,027.48	$61,917.84	$70,663.19	$24,044.20	$59,803.05	$58,435.91
Number of Active Retirants		1	2	10	3	12	3	8	39
July 1, 2019 to June 30, 2020									
Average Monthly Benefit		$2,246.54	$2,672.54	$3,796.62	$3,751.11			$6,126.68	$4,770.17
Average Final Salary		$70,328.04	$72,279.84	$73,364.66	$72,571,38			$91,719.95	$81,757.91
Number of Active Retirants		1	1	5	4			10	21
July 1, 2018 to June 30, 2019									
Average Monthly Benefit		$455.07	$2,111.54	$3,374.59	$3,943.38	$4,902.10	$5,823.91	$5,690.03	$3,532.33
Average Final Salary		$56,573.88	$53,477.12	$77,543.75	$75,695.64	$84,403.44	$93,541.20	$82,712.42	$72,182.33
Number of Active Retirants		3	6	9	1	1	1	7	28
July 1, 2017 to June 30, 2018									
Average Monthly Benefit		$1,307.49	$2,490.53	$3,100.20		$3,562.34	$4,826.30	$5,100.57	$3,976.96
Average Final Salary		$31,379.76	$68,832.18	$60,334.20		$68,125.68	$77,928.36	$75,940.20	$68,584.98
Number of Active Retirants		1	2	4		1	2	7	17

Schedule of Average Benefit Payments

	Years of Credited Service								
	0-9	10-15	16-20	21-24	25	26-29	30	31+	TOTAL
July 1, 2016 to June 30, 2017									
Average Monthly Benefit	$337.90	$996.04	$556.17	$2,927.97	$1,186.14	$2,670.20	$4,606.06	$3,493.16	$2,716.76
Average Final Salary	$19,659.72	$45,533.40	$22,015.92	$67,682.80	$28,912.20	$54,518.06	$72,101.25	$47,949.84	$55,208.79
Number of Active Retirants	1	1	1	6	2	6	4	1	22
July 1, 2015 to June 30, 2016									
Average Monthly Benefit	$314.65			$2,078.23		$3,012.97	$1,729.45	$5,059.27	$2,672.66
Average Final Salary	$53,305.68			$45,947.58		$37,841.45	$50,692.08	$51,223.20	$43,534.73
Number of Active Retirants	3			6		13	1	3	26
July 1, 2014 to June 30, 2015									
Average Monthly Benefit			$1,831.19	$1,719.04	$1,978.03	$4,054.02		$4,758.40	$3,371.84
Average Final Salary			$45,652.04	$30,832.33	$36,844.69	$51,499.73		$67,377.63	$49,438.65
Number of Active Retirants			3	3	2	10		4	22
July 1, 2013 to June 30, 2014									
Average Monthly Benefit			$401.76	$2,013.42		$2,756.37	$3,898.78	$4,528.45	$3,313.21
Average Final Salary			$15,019.06	$54,344.38		$51,232.69	$69,760.18	$68,010.73	$59,196.43
Number of Active Retirants			1	5		8	5	9	28
July 1, 2012 to June 30, 2013									
Average Monthly Benefit	$661.61	$710.09		$1,172.98	$1,696.31	$2,859.71		$3,269.65	$2,327.34
Average Final Salary	$21,843.63	$36,998.42		$31,851.99	$28,672.69	$54,157.79		$54,646.02	$46,220.07
Number of Active Retirants	1	2		3	2	11		4	23

Section VIII: Projection Results

Annual actuarial valuations are performed for HSPRS which re-measure the assets and liabilities and the adequacy of the contribution rate. Actuarial projections are also performed every year with sensitivity testing of several factors. HSPRS also has experience studies performed every two years to analyze the discrepancies between actuarial assumptions and actual experience and determine if the actuarial assumptions need to be changed. Annual actuarial valuations and projections and periodic experience studies are practical ways to monitor and reassess risk.

As mentioned earlier in the report, the intended purpose of the projection results is to help assess the Plan's funding progress and to provide information to decision makers to help ensure that the applicable pension liabilities and funding mechanisms are managed in a manner that promotes sustainability.

The projection process should be viewed as an enhancement to the actuarial valuation control cycle by providing additional evaluation metrics to assess the need for further, in-depth analysis of the risks to the Plan's sustainability. The actuarial valuation control cycle is a key component of managing a long-term liability whose ultimate value is based upon uncertain future events. As the ultimate value of future cash flows cannot be predicted with certainty, pension liabilities are managed in the short-term through the continuous monitoring of economic and demographic assumptions, with a keen eye on the identification, measurement, and management of risks.

The projection process, like other actuarial modeling, is not intended to provide absolute results. The intended purpose of the projection process is to identify anticipated trends and to compare various outcomes, under a given methodology, rather than predicting certain future events. The results produced by the projection process do not predict the financial condition of the Plan or the Plan's ability to pay benefits in the future and do not provide any guarantee of future financial soundness of the Plan. Because actual experience will not unfold exactly as expected, actual results can be expected to differ from the results presented herein. To the extent actual experience deviates significantly from the assumptions, results could be significantly better or significantly worse than the expected outcome indicated in this report.

Section VIII: Projection Results

Special Assumptions

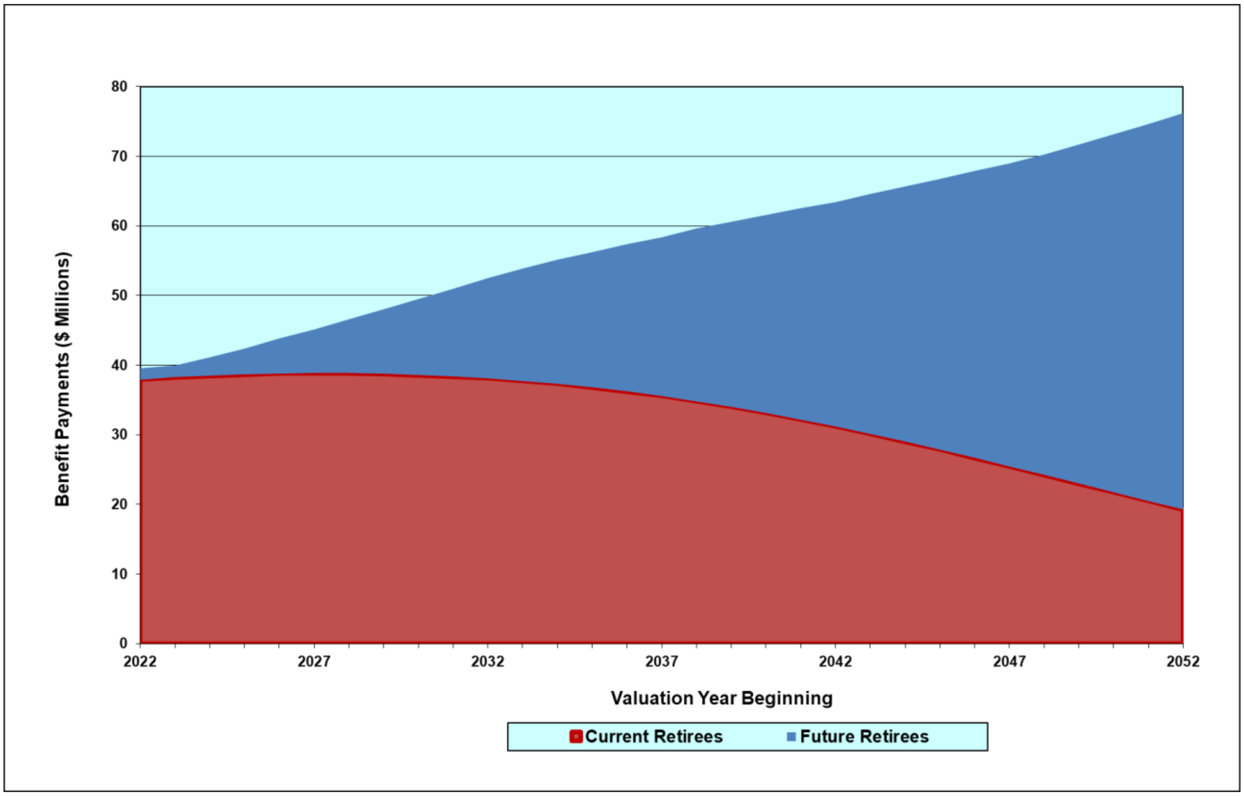
In addition to the regular valuation assumptions used in performing the annual actuarial valuations of HSPRS, additional assumptions must be made that are unique to projections. The first of these is what, if any, change in the overall active membership will be anticipated. For this projection study, it was assumed that the number of active members would remain static over the 30-year projection period.

But since we assume active members will leave the system through termination, death, disability, or retirement, we need to make some assumptions as to the composition of new hires that will replace departing members in order to maintain the membership at a constant number. The new entrant profile we developed was based on the new hires in the last five years prior to the projection start date of June 30, 2022, plus it includes the impact of Senate Bill 2120. That profile is summarized in the table below.

Age	Average Pay	Percent Male	Weight
23	$52,000	95%	12%
25	$52,000	95%	32%
29	$52,000	95%	19%
32	$52,000	85%	18%
38	$52,000	95%	8%
41	$52,000	95%	7%
48	$54,000	100%	4%

Section VIII: Projection Results

For the projection results presented in this section of the report, it was further assumed that the benefit structure as it exists on June 30, 2022 would remain in place for the following 30 years. The following graph shows the projection of benefit payments of HSPRS members. The red area of the graph represents the benefit payments for current retirees and the blue area represents the benefit payments for any future retirees. HSPRS currently pays approximately $37 million in benefit payments to its retirees but over the 30-year period, that amount is expected to nearly double.



Section VIII: Projection Results

FUTURE MEMBERSHIP

The following chart and graph show the headcounts of active participants and retired members over the projection period. The actives are broken down into those existing as of June 30, 2022 and those who are hired after June 30, 2022. Although the active membership as of the last valuation date was lower than the previous year, PERS staff has confirmed that a new class of officers graduated subsequent to the valuation date. Therefore, we have assumed the active membership will continue at a population of 515 active members over the projected period, which is similar to last year's projection analysis.

Member	2022	2027	2032	2042	2052
Active – Existing Employees	478	362	248	90	9
Active – New Entrants	0	153	267	425	506
Retirees	591	677	774	937	1,050
Beneficiaries	181	197	213	211	216
Disableds	13	10	10	12	16
Vested Terminations	42	33	45	63	73
Total	1,305	1,432	1,557	1,738	1,870

Section VIII: Projection Results

PROJECTION RESULTS

The baseline projection results shown below use the same actuarial assumptions as used the June 30, 2022 actuarial valuation report. Please note that contributions from SB 2659 and HB 1015 are assumed to continue to provide an additional $3,600,000 annually throughout the projection period under all scenarios. These dollars are in addition to the employer contributions as a percent of payroll shown below. In addition, the projection results using different long-term investment return assumptions for future valuations (7.25% and 7.00%) are included.

Baseline Projection Results (7.55%)
($000's)

	2022	2027	2032	2042	2052
Total Payroll	$33,759	$40,094	$43,765	$54,691	$70,197
UAL	$184,865	$192,234	$174,733	$85,038	$0
Normal Cost Rate	16.06%	16.47%	16.75%	16.92%	17.09%
UAL Rate	33.02%	32.61%	32.33%	32.16%	31.99%
Total Rate	49.08%	49.08%	49.08%	49.08%	49.08%
Funding Ratio	69.4%	71.7%	76.9%	90.6%	114.6%
Amortization Period	20 years	17 years	13 years	4 years	0 years
Cash Flow %	(3.92)%	(3.73)%	(4.05)%	(3.36)%	(2.44)%

Projection Results Assuming 7.25% (Long-Term Investment Return)
($000's)

	2022	2027	2032	2042	2052
Total Payroll	$33,759	$40,094	$43,765	$54,691	$70,197
UAL	$206,099	$220,630	$217,419	$180,315	$48,065
Normal Cost Rate	16.06%	18.34%	18.65%	18.84%	19.05%
UAL Rate	33.02%	30.74%	30.43%	30.24%	30.03%
Total Rate	49.08%	49.08%	49.08%	49.08%	49.08%
Funding Ratio	67.0%	68.6%	72.2%	80.8%	95.8%
Amortization Period	22 years	22 years	19 years	11 years	2 years
Cash Flow %	(3.92)%	(3.79)%	(4.19)%	(3.64)%	(2.82)%

Section VIII: Projection Results

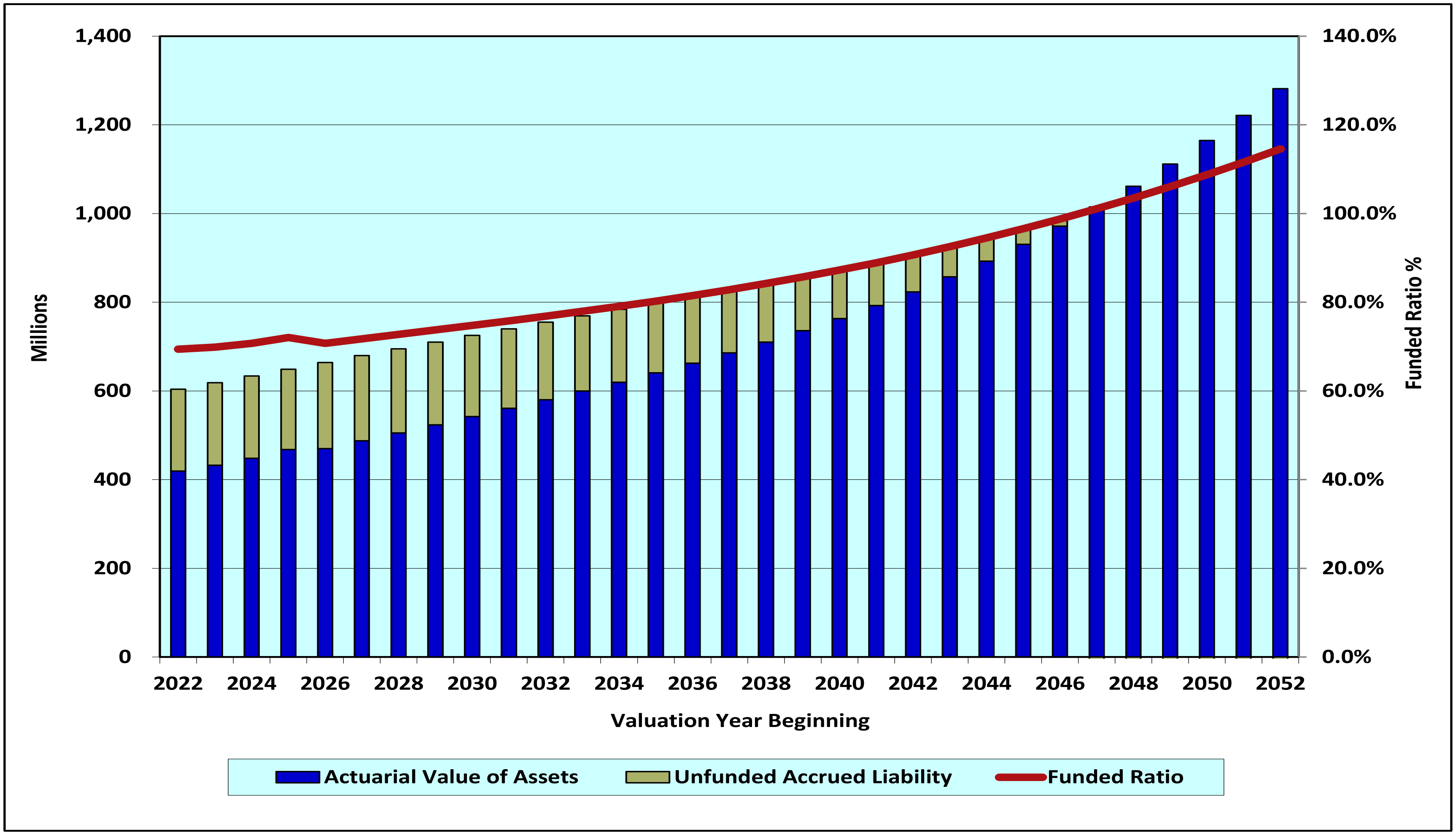
Projection Results Assuming 7.00% (Long-Term Investment Return)
($000's)

	2022	2027	2032	2042	2052
Total Payroll	$33,759	$40,094	$43,765	$54,691	$70,197
UAL	$223,948	$244,404	$252,785	$256,965	$211,868
Normal Cost Rate	16.06%	19.92%	20.24%	20.46%	20.70%
UAL Rate	33.02%	29.16%	28.84%	28.62%	28.38%
Total Rate	49.08%	49.08%	49.08%	49.08%	49.08%
Funding Ratio	65.2%	66.2%	68.5%	73.4%	82.2%
Amortization Period	24 years	27 years	26 years	20 years	11 years
Cash Flow %	(3.92)%	(3.84)%	(4.31)%	(3.90)%	(3.19)%

The graph that follows shows the projection of the Unfunded Accrued Liability (UAL), Actuarial Value of Assets and the Funded Ratio under the baseline valuation (assuming 7.55%) from the amounts shown in the table on the previous page. As you can see, under the current assumptions, the funded ratio shows a steady increase during the projection period reaching 100% in 2047.

Section VIII: Projection Results

Mississippi PERS – HSPRS Plan
30 Year Projection of Funded Ratio on Actuarial Asset Value
Based on June 30, 2022 Valuation Results



Section IX: Cash Flow Projections

CASH FLOW PROJECTIONS

The funded ratio is the primary measure of funded status of a pension plan and, thereby, the most common measurement used for drawing conclusions on funding progress. The funded ratio is the ratio of the actuarial value of assets to the actuarial or accrued liability of the system as calculated by the funding method used in developing system contribution levels. When using the funded ratio in assessing trends over several valuations, we recommend that the basis for determining both the assets and liabilities in the ratio are taken into consideration and reasonable efforts are made to adjust the ratio to reflect these differences when they are known. On a consistent basis, an increasing funded ratio would typically indicate progress in meeting the obligations of the system. In most cases, other measures should also be considered in a trend assessment. These may include the trend in the length of the amortization period, the required contribution rate, percentage of required contributions funded, and the unfunded actuarial liability as a percentage of payroll. Focusing solely on any one measure as the indication of funding progress is an over-simplification of a complex and dynamic system.

Another of those additional metrics is an outlook on the cash flow as a percentage of assets for the System. Most retirement systems are funded with an advance-funding mechanism, meaning contributions and investment earnings are earned during a member's active lifetime in order to pay for the benefit payments during his retirement years. Many mature retirement systems, like HSPRS, have negative cash flow, where benefit payments paid out of the trust are more than the contributions being collected by employers and employees.

Section IX: Cash Flow Projections

For the fiscal year ending June 30, 2023, we are projecting HSPRS to have a negative cash flow of approximately $16 Million (benefit payments of $40 Million and contributions of $24 Million). With a market value of assets of $405 Million as of June 30, 2022, the cash flow as a percentage of assets is estimated to be negative 3.92% for the 2023 fiscal year. While the market value of assets is assumed to earn 7.55% each year, the difference between the investment return assumption and the negative cash flow percentage is positive, meaning assets are projected to grow for the 2023 fiscal year. When assets do not earn a positive return enough to cover this negative cash flow percentage, assets are expected to decline for the year. If the negative cash flow percentage does not grow more than the assumed investment return assumption, the System's assets will continue to increase, and sustainability of the plan may be achieved.

The tables on the following pages demonstrate the open group projection of cash flow on (1), the baseline assumption, and then (2), a sensitivity analysis, using a one-year return of negative 7.00% for the fiscal year ending June 30, 2023. This demonstrates the projection of this metric if HSPRS experiences one significant bad investment year in one of the next five years without a correction in the market. As can be seen from the table on page 31, the cash flow as a percentage of market value of assets does not at any point get less than negative 4.06% on the baseline assumptions, meaning that HSPRS assets should continue to increase as long as all baseline actuarial assumptions are met.

If there is a significant negative investment experience in one of the next five years (as seen on the table on page 32), the negative cash flow will be less than the baseline cash flow, however, HSPRS will not have a decrease in their assets at any point during the remaining projection period.

Section IX: Cash Flow Projections

Mississippi PERS
30-year Open Group Projection of Cash Flow
HSPRS Plan
Based on June 30, 2022 Valuation Results

Projection of Cash Flow

Contribution Methodology: Employee and Employer Contributions
Investment Return Methodology: As Programmed

Valuation Year Beginning July 1	Expected Short-term Investment Return	Valuation Annual Payroll	Market Value of Assets July 1	Total Contributions	Projected Benefit Payments	Ratio of Cash Flow to MVA	Expected Investment Return	Net Cash Flow	Market Value of Assets June 30	Valuation Year Ending June 30
2022	*7.55%*	*35,170,951*	*405,372,000*	*23,708,033*	*(39,605,531)*	-3.92%	*30,016,374*	*14,118,876*	*419,490,876*	**2023**
2023	*7.55%*	*37,827,298*	*419,490,876*	*25,234,279*	*(39,974,055)*	-3.51%	*31,125,258*	*16,385,482*	*435,876,358*	**2024**
2024	*7.55%*	*38,612,592*	*435,876,358*	*25,685,483*	*(41,146,304)*	-3.55%	*32,335,638*	*16,874,816*	*452,751,174*	**2025**
2025	*7.55%*	*39,353,212*	*452,751,174*	*26,111,018*	*(42,422,478)*	-3.60%	*33,578,159*	*17,266,699*	*470,017,873*	**2026**
2026	*7.55%*	*40,093,694*	*470,017,873*	*26,536,473*	*(43,799,644)*	-3.67%	*34,846,522*	*17,583,352*	*487,601,224*	**2027**
2027	*7.55%*	*40,813,334*	*487,601,224*	*26,949,954*	*(45,147,045)*	-3.73%	*36,139,451*	*17,942,360*	*505,543,585*	**2028**
2028	*7.55%*	*41,557,515*	*505,543,585*	*27,377,535*	*(46,593,353)*	-3.80%	*37,456,342*	*18,240,524*	*523,784,109*	**2029**
2029	*7.55%*	*42,219,790*	*523,784,109*	*27,758,056*	*(48,039,997)*	-3.87%	*38,793,987*	*18,512,046*	*542,296,154*	**2030**
2030	*7.55%*	*42,966,781*	*542,296,154*	*28,187,251*	*(49,460,203)*	-3.92%	*40,154,917*	*18,881,966*	*561,178,120*	**2031**
2031	*7.55%*	*43,765,402*	*561,178,120*	*28,646,112*	*(50,959,710)*	-3.98%	*41,541,936*	*19,228,338*	*580,406,458*	**2032**
2032	*7.55%*	*44,496,236*	*580,406,458*	*29,066,024*	*(52,546,539)*	-4.05%	*42,950,425*	*19,469,911*	*599,876,369*	**2033**
2033	*7.55%*	*45,266,991*	*599,876,369*	*29,508,874*	*(53,888,284)*	-4.06%	*44,387,088*	*20,007,678*	*619,884,047*	**2034**
2034	*7.55%*	*46,290,041*	*619,884,047*	*30,096,684*	*(55,155,970)*	-4.04%	*45,872,469*	*20,813,183*	*640,697,229*	**2035**
2035	*7.55%*	*47,382,235*	*640,697,229*	*30,724,221*	*(56,233,198)*	-3.98%	*47,427,198*	*21,918,222*	*662,615,451*	**2036**
2036	*7.55%*	*48,499,628*	*662,615,451*	*31,366,237*	*(57,345,501)*	-3.92%	*49,064,593*	*23,085,329*	*685,700,780*	**2037**
2037	*7.55%*	*49,660,645*	*685,700,780*	*32,033,318*	*(58,391,914)*	-3.84%	*50,793,476*	*24,434,880*	*710,135,660*	**2038**
2038	*7.55%*	*50,866,218*	*710,135,660*	*32,725,999*	*(59,575,476)*	-3.78%	*52,620,116*	*25,770,639*	*735,906,299*	**2039**
2039	*7.55%*	*52,028,804*	*735,906,299*	*33,393,982*	*(60,602,313)*	-3.70%	*54,552,499*	*27,344,168*	*763,250,467*	**2040**
2040	*7.55%*	*53,323,992*	*763,250,467*	*34,138,153*	*(61,568,215)*	-3.59%	*56,608,765*	*29,178,703*	*792,429,170*	**2041**
2041	*7.55%*	*54,691,451*	*792,429,170*	*34,923,848*	*(62,500,580)*	-3.48%	*58,806,321*	*31,229,589*	*823,658,759*	**2042**
2042	*7.55%*	*56,123,609*	*823,658,759*	*35,746,718*	*(63,426,313)*	-3.36%	*61,160,343*	*33,480,747*	*857,139,506*	**2043**
2043	*7.55%*	*57,562,708*	*857,139,506*	*36,573,575*	*(64,564,801)*	-3.27%	*63,676,589*	*35,685,363*	*892,824,869*	**2044**
2044	*7.55%*	*58,921,972*	*892,824,869*	*37,354,562*	*(65,630,684)*	-3.17%	*66,360,275*	*38,084,153*	*930,909,022*	**2045**
2045	*7.55%*	*60,424,124*	*930,909,022*	*38,217,647*	*(66,687,439)*	-3.06%	*69,228,451*	*40,758,659*	*971,667,681*	**2046**
2046	*7.55%*	*61,988,899*	*971,667,681*	*39,116,714*	*(67,875,085)*	-2.96%	*72,295,034*	*43,536,663*	*1,015,204,344*	**2047**
2047	*7.55%*	*63,529,248*	*1,015,204,344*	*40,001,746*	*(68,968,206)*	-2.85%	*75,574,339*	*46,607,879*	*1,061,812,223*	**2048**
2048	*7.55%*	*65,228,716*	*1,061,812,223*	*40,978,202*	*(70,209,706)*	-2.75%	*79,083,411*	*49,851,907*	*1,111,664,130*	**2049**
2049	*7.55%*	*66,847,963*	*1,111,664,130*	*41,908,567*	*(71,659,996)*	-2.68%	*82,827,960*	*53,076,530*	*1,164,740,660*	**2050**
2050	*7.55%*	*68,493,525*	*1,164,740,660*	*42,854,051*	*(73,116,902)*	-2.60%	*86,816,283*	*56,553,432*	*1,221,294,092*	**2051**
2051	*7.55%*	*70,197,172*	*1,221,294,092*	*43,832,908*	*(74,603,792)*	-2.52%	*91,067,238*	*60,296,354*	*1,281,590,446*	**2052**
2052	*7.55%*	*71,962,187*	*1,281,590,446*	*44,847,026*	*(76,159,459)*	-2.44%	*95,599,541*	*64,287,108*	*1,345,877,554*	**2053**

Section IX: Cash Flow Projections

Mississippi PERS
30-year Open Group Projection of Cash Flow
HSPRS Plan
Based on June 30, 2022 Valuation Results

Projection of Cash Flow

Contribution Methodology: Employee and Employer Contributions
Investment Return Methodology: As Programmed

Valuation Year Beginning July 1	Expected Short-term Investment Return	Valuation Annual Payroll	Market Value of Assets July 1	Total Contributions	Projected Benefit Payments	Ratio of Cash Flow to MVA	Expected Investment Return	Net Cash Flow	Market Value of Assets June 30	Valuation Year Ending June 30
2022	-7.00%	35,170,951	405,372,000	23,708,033	(39,605,531)	-3.92%	(27,809,534)	(43,707,032)	361,664,968	2023
2023	7.55%	37,827,298	361,664,968	25,234,279	(39,974,055)	-4.08%	26,759,402	12,019,626	373,684,594	2024
2024	7.55%	38,612,592	373,684,594	25,685,483	(41,146,304)	-4.14%	27,640,160	12,179,338	385,863,932	2025
2025	7.55%	39,353,212	385,863,932	26,111,018	(42,422,478)	-4.23%	28,528,173	12,216,713	398,080,645	2026
2026	7.55%	40,093,694	398,080,645	26,536,473	(43,799,644)	-4.34%	29,415,261	12,152,091	410,232,735	2027
2027	7.55%	40,813,334	410,232,735	26,949,954	(45,147,045)	-4.44%	30,298,130	12,101,039	422,333,775	2028
2028	7.55%	41,557,515	422,333,775	27,377,535	(46,593,353)	-4.55%	31,174,001	11,958,183	434,291,958	2029
2029	7.55%	42,219,790	434,291,958	27,758,056	(48,039,997)	-4.67%	32,037,330	11,755,389	446,047,346	2030
2030	7.55%	42,966,781	446,047,346	28,187,251	(49,460,203)	-4.77%	32,888,132	11,615,181	457,662,527	2031
2031	7.55%	43,765,402	457,662,527	28,646,112	(50,959,710)	-4.88%	33,726,508	11,412,910	469,075,437	2032
2032	7.55%	44,496,236	469,075,437	29,066,024	(52,546,539)	-5.01%	34,544,933	11,064,419	480,139,856	2033
2033	7.55%	45,266,991	480,139,856	29,508,874	(53,888,284)	-5.08%	35,346,981	10,967,571	491,107,427	2034
2034	7.55%	46,290,041	491,107,427	30,096,684	(55,155,970)	-5.10%	36,149,834	11,090,548	502,197,974	2035
2035	7.55%	47,382,235	502,197,974	30,724,221	(56,233,198)	-5.08%	36,970,504	11,461,528	513,659,502	2036
2036	7.55%	48,499,628	513,659,502	31,366,237	(57,345,501)	-5.06%	37,818,419	11,839,155	525,498,657	2037
2037	7.55%	49,660,645	525,498,657	32,033,318	(58,391,914)	-5.02%	38,698,216	12,339,620	537,838,277	2038
2038	7.55%	50,866,218	537,838,277	32,725,999	(59,575,476)	-4.99%	39,611,663	12,762,186	550,600,463	2039
2039	7.55%	52,028,804	550,600,463	33,393,982	(60,602,313)	-4.94%	40,561,908	13,353,577	563,954,040	2040
2040	7.55%	53,323,992	563,954,040	34,138,153	(61,568,215)	-4.86%	41,561,885	14,131,823	578,085,863	2041
2041	7.55%	54,691,451	578,085,863	34,923,848	(62,500,580)	-4.77%	42,623,402	15,046,670	593,132,533	2042
2042	7.55%	56,123,609	593,132,533	35,746,718	(63,426,313)	-4.67%	43,755,613	16,076,017	609,208,550	2043
2043	7.55%	57,562,708	609,208,550	36,573,575	(64,564,801)	-4.59%	44,957,802	16,966,576	626,175,126	2044
2044	7.55%	58,921,972	626,175,126	37,354,562	(65,630,684)	-4.52%	46,228,220	17,952,098	644,127,224	2045
2045	7.55%	60,424,124	644,127,224	38,217,647	(66,687,439)	-4.42%	47,576,425	19,106,633	663,233,857	2046
2046	7.55%	61,988,899	663,233,857	39,116,714	(67,875,085)	-4.34%	49,008,280	20,249,909	683,483,766	2047
2047	7.55%	63,529,248	683,483,766	40,001,746	(68,968,206)	-4.24%	50,529,436	21,562,976	705,046,742	2048
2048	7.55%	65,228,716	705,046,742	40,978,202	(70,209,706)	-4.15%	52,147,617	22,916,113	727,962,855	2049
2049	7.55%	66,847,963	727,962,855	41,908,567	(71,659,996)	-4.09%	53,858,514	24,107,084	752,069,939	2050
2050	7.55%	68,493,525	752,069,939	42,854,051	(73,116,902)	-4.02%	55,659,643	25,396,792	777,466,731	2051
2051	7.55%	70,197,172	777,466,731	43,832,908	(74,603,792)	-3.96%	57,558,272	26,787,388	804,254,119	2052
2052	7.55%	71,962,187	804,254,119	44,847,026	(76,159,459)	-3.89%	59,560,648	28,248,215	832,502,334	2053

Section X: Sensitivity Analysis

SENSITIVITY ANALYSIS

Measuring pension obligations and actuarially determined contributions requires the use of assumptions regarding future economic and demographic experience. Whenever assumptions are made about future events, there is risk that actual experience will differ from expected. Actuarial valuations include the risk that actual future measurements will deviate from expected future measurements due to actual experience that is different than the actuarial assumptions. The primary areas of risk in this actuarial valuation are.

- Investment Risk – the potential that actual investment returns will be different than expected.
- Longevity and Other Demographic Risks – the potential that mortality or other demographic experience will be different than expected.
- Interest Rate Risk – To the extent market rates of interest affect the expected return on assets, there is a risk of change to the discount rate which determines the present value of liabilities and actuarial valuation results.
- Contribution Risk – The potential that actual contributions are different than the fixed contribution rates.

Section X: Sensitivity Analysis

Investment Risk

In this section of the report, we will demonstrate the variability in achieving funding goals based on sensitivity around the three key variables listed above. Earlier in this section, we reviewed the projections if the long-term investment return assumption was lowered to rates below 7.55%. In this section, we keep the long-term investment return assumption at 7.55% but review the sensitivity of short-term investment returns as a single year event (and then 7.55% for all years thereafter) and simulate the next 10-year periods of return (and then 7.55% for all years thereafter).

Projected Funded Ratios in 2042

Single Year Event	2022 Valuation	2021 Valuation
• 1.55% for the next fiscal year	80.2%	114.3%
• 3.55% for the next fiscal year	83.7%	119.0%
• 5.55% for the next fiscal year	87.2%	123.7%
• **7.55% for the next fiscal year (Baseline)**	**90.6%**	**128.5%**
• 9.55% for the next fiscal year	94.1%	133.2%
• 11.55% for the next fiscal year	97.6%	138.0%
• 13.55% for the next fiscal year	101.1%	142.7%
• Simulate 2008 loss using -15% for the next fiscal year	51.3%	75.0%
Average Returns over next 10-Year Period (Simulated returns using mean and standard deviations from PERS' Investment Consultant's Capital Market Assumptions)*	**2022 Valuation**	**2021 Valuation**
• 6.00%	68.8%	98.5%
• 7.00%	82.8%	117.6%
• 8.00%	100.6%	141.9%

* *6.00% Average Returns over the next 10-Year Period: 7.04%, 10.32%, 2.25%, 5.45%, 8.52%, 0.00%, 5.44%, 11.49%,-7.04%, 18.53%*
7.00% Average Returns over the next 10-Year Period: 3.61%, 20.67%,-0.02%, 11.58%,-4.84%, 8.13%, 18.10%, 2.04%, 0.83%, 12.67%
8.00% Average Returns over the next 10 Year Period: 9.00%, 9.01%, 16.24%, 4.84%, 16.62%, 6.78%,-3.74%, 6.19%, 18.57%,-1.19%

Section X: Sensitivity Analysis

As can be seen from the projected funded ratios on the table above, the sensitivity of short-term investment returns does have an impact to the funding of HSPRS in the long-term, especially another repeat of the Great Recession of 2008. We believe it demonstrates the importance of these continued projection reports and the continued monitoring of this sensitivity analysis because short-term differences in investment returns can have a major impact on the projection of funded ratios.

Section X: Sensitivity Analysis

Demographic Risk

While actual investment returns compared to that assumed is the most critical driver of funding, many other assumptions are used in the actuarial projections to review sensitivity, such as population growth and wage inflation. Variances in these other assumptions over the long-term may also have an impact on the funding of the Plan.

For HSPRS, there have been significant fluctuations in active membership since 2008. In the baseline projections we assume a static population of 515 active members. For sensitivity analysis, we have performed the projections assuming both a 0.25% and 0.50% increase and decrease each year around this static assumption. In the table below, we review these alternatives to the static active membership growth:

Projected Funded Ratio in 2042

Active Membership Growth	2022 Valuation	2021 Valuation
• Increase 0.50% each year	92.9%	130.3%
• Increase 0.25% each year	91.7%	129.4%
• **Static Population (Baseline Assumption)**	**90.6%**	**128.5%**
• Decrease 0.25% each year	89.6%	127.6%
• Decrease 0.50% each year	88.5%	126.7%

Section X: Sensitivity Analysis

Assumption Risk

We also performed a sensitivity analysis for the wage inflation assumption. As a result of the experience study presented in April 2021, the Board adopted a reduction in the wage inflation assumption from 3.00% to 2.65%, which is 0.25% above the price inflation of 2.40%. Wage inflation is a major component of the underlying salary increase assumptions, as well as the amortization of the Unfunded Accrued Liability which is based on the level percent of payroll amortization methodology.

In the table below, the second scenario lowers the discount rate to 7.30% but does not change the price inflation or wage inflation. The third scenario lowers the price and wage inflation by 0.30% and lowers the discount rate to 7.30%.

Projected Funded Ratios in 2042

Scenario	Price Inflation	Discount Rate	Wage Inflation	2022 Valuation	2021 Valuation
1 - Baseline	2.40%	7.55%	2.65%	**90.6%**	**128.5%**
2	2.40%	7.30%	2.65%	82.4%	116.4%
3	2.10%	7.30%	2.35%	80.3%	114.9%

Section X: Sensitivity Analysis

Contribution Risk

To demonstrate the contribution risk of making the Fixed Contribution Rates (FCR) for SLRP, we have calculated the projected funded ratios if the FCRs were 1% higher or 1% lower than the current rates for all future years.

Projected Funded Ratios in 2042

Change in Fixed Contribution Rate (FCR)	2022 Valuation	2021 Valuation
• Baseline	**90.6%**	**128.5%**
• 1.00% increase in FCR	92.6%	130.4%
• 1.00% decrease in FCR	88.7%	126.6%

Over a long projection period, gains and losses due to population growth and wage inflation assumptions will be relatively concentrated around the expected value of these assumptions. So, the impact of the sensitivity around these baseline assumptions is small when compared to the investment return assumption.

Section XI: Projection Summary

Utilizing the metrics based on the funding policy for PERS and with a fixed contribution rate as a percentage of annual compensation of 49.08% of payroll, the projection results for 2022 for HSPRS show that the Plan will have a "Green Light" status for all metrics. **Therefore, we recommend to the PERS Board that the Fixed Contribution Rate (FCR) continue at a rate of 49.08% of annual compensation for HSPRS beginning July 1, 2024.**

Metrics	2022 Projection with 49.08% FCR (7.55%)	2022 Status
Funding Ratio in 2042	90.6%	Green
Cash Flow as a Percentage of Assets	-4.1%	Green
ADC/FCR Ratio from 2022 Valuation	86.8%	Green
ADC/FCR Ratio from 2023 Valuation	84.8%	Green

Schedule A: Development of Actuarial Value of Assets

($ thousands)

	Valuation Date June 30:	2021	2022	2023	2024	2025	2026
A.	Actuarial Value Beginning of Year	$373,511	$403,748				
B.	Market Value End of Year	463,984	405,372				
C.	Market Value Beginning of Year	364,102	463,984				
D.	Cash Flow						
	D1. Contributions	18,396	18,331				
	D2. Other Revenue	3,544	3,501				
	D3. Benefit Payments	(37,433)	(40,522)				
	D4. Refunds	(66)	(134)				
	D5. Administrative Expenses	(320)	(319)				
	D6. Net	(15,879)	(19,143)				
E.	Investment Income						
	E1. Market Total: B.-C.-D6.	115,761	(39,469)				
	E2. Assumed Rate	7.75%	7.55%				
	E3. Amount for Immediate Recognition	27,603	35,217				
	E4. Amount for Phased-In Recognition	88,158	(74,686)				
F.	Phased-In Recognition of Investment Income						
	F1. Current Year: 0.20*E4.	17,632	(14,937)				
	F2. First Prior Year	(3,334)	17,632	(14,937)			
	F3. Second Prior Year	(331)	(3,334)	17,632	(14,937)		
	F4. Third Prior Year	367	(331)	(3,334)	17,632	(14,937)	
	F5. Fourth Prior Year	4,181	367	(331)	(3,334)	17,632	(14,937)
	F6. Total Recognized Investment Gain	18,515	(604)	(971)	(640)	2,694	(14,937)
G.	Actuarial Value End of Year: A + D6. + E3. + F6.	$403,748	$419,219				
H.	Difference Between Market & Actuarial Values	$60,236	$(13,847)	$(12,876)	$(12,236)	$(14,930)	$7

The Actuarial Valuation of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased in over a closed 5 year period. During periods when investment performance exceeds the assumed rate, Actuarial Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Actuarial Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for 4 consecutive years, actuarial value will become equal to market value.

Schedule A: Development of Actuarial Value of Assets

Asset Summary June 30, 2022 ($ in Thousands)		
	Market Value	**Actuarial Value**
(1) Assets at June 30, 2021	$463,984	$403,748
(2) Contributions and Misc. Revenue	21,832	21,832
(3) Investment Increment	(39,469)	34,614
(4) Benefit Payments	(40,522)	(40,522)
(5) Refunds	(134)	(134)
(6) Administrative Expenses	(319)	(319)
(7) Assets at June 30, 2022 (1)+(2)+(3)+(4)+(5)+(6)	$405,372	$419,219
(8) Net Investment Return [2 x (3)] / [(7) + (1) – (3)]	(8.69)%	8.78%

Schedule B: Statement of Actuarial Assumptions & Methods

The assumptions and methods used in the valuation are based on the results of the experience Investigation for the four-year period ending June 30, 2020, dated April 20, 2021, and adopted by the Board in August 2021.

INTEREST RATE: 7.55% per annum, compounded annually (net of investment expenses only). The expected return on assets consists of 2.40% price inflation and 5.15% real rate of return.

SEPARATIONS FROM ACTIVE SERVICE: Representative values of the assumed annual rates of separation from active service are as follows:

	Withdrawal		Death*		Disability			
Age	Less than 20 years of service	20 or more years of service	Males	Females	Non-Duty	Duty	Service	Service Retirement**
25	7.000%		0.0567%	0.0189%	0.0360%	0.0023%	5	7.5%
30	4.000		0.0630	0.0259	0.0450	0.0068	10	7.5%
35	2.750	1.375%	0.0714	0.0350	0.0585	0.0180	15	7.5%
40	2.000	1.000	0.0893	0.0483	0.0765	0.0248	20	7.5%
45	2.000	1.000	0.1218	0.0665	0.1125	0.0225	25	20.0%
50	2.000	1.000	0.1764	0.0917	0.1890	0.0180	30	15.0%
55	0.000	0.000	0.2594	0.1274	0.3420	0.0068	35	35.0%
60	0.000	0.000	0.3980	0.1757	0.5805	0.0023	40+	100.0%

* Adjusted Base Rates.
* The annual rate of service retirement is 100% at age 63.

It is assumed that a member will be granted 1¾ years of service credit for unused leave at termination of employment. In addition, it is assumed that, on average, ¼ year of service credit for peace-time military service will be granted to each member.

Schedule B: Statement of Actuarial Assumptions & Methods

SALARY INCREASES: Representative values of the assumed annual rates of salary increases are as follows:

		Annual Rates of	
Age	Merit & Seniority	Base (Economy)	Increase Next Year
20	5.91%	2.65%	8.56%
25	2.66	2.65	5.31
30	1.84	2.65	4.49
35	1.84	2.65	4.49
40	1.84	2.65	4.49
45	1.35	2.65	4.00
50	0.85	2.65	3.50
55	0.85	2.65	3.50
60	0.35	2.65	3.00

DEATH AFTER RETIREMENT:

*Service Retirees**

Membership Table	Adjustment to Rates	Projection Scale
PubS.H-2010(B) Retiree	Male: 95% up to age 60, 110% for ages 61 to 75, and 101% for ages above 77 Female: 84% up to age 72, 100% for ages above 76	MP-2020

*Contingent Annuitants**

Membership Table	Adjustment to Rates	Projection Scale
PubS.H-2010(B) Contingent Annuitant	Male: 97% for all ages Female: 110% for all ages	MP-2020

*Disabled Retirees**

Membership Table	Adjustment to Rates	Projection Scale
PubG.H-2010 Disabled	Male: 134% for all ages Female: 121% for all ages	MP-2020

* Please note that none of the recommended tables have any setbacks or setforwards.

Representative values of the assumed rates of death after retirement are as follows:

	Rates of Death After Retirement*					
	Service Retirees		Contingent Annuitants		Disabled Retirees	
AGE	Male	Female	Male	Female	Male	Female
45	0.2983%	0.0983%	0.7692%	0.5104%	1.4660%	1.1919%
50	0.4190%	0.1638%	0.8837%	0.6556%	2.2780%	1.7956%
55	0.5197%	0.2738%	1.0156%	0.7843%	2.9855%	2.1078%
60	0.7771%	0.4578%	1.2397%	1.0131%	3.6475%	2.4684%
65	1.3211%	0.7652%	1.6286%	1.4157%	4.5426%	2.9730%
70	2.1758%	1.2785%	2.4153%	1.9998%	5.8129%	3.8127%
75	3.8566%	2.3659%	3.7209%	3.0052%	7.6661%	5.2683%
80	6.2640%	4.2530%	5.7734%	4.7289%	10.8125%	7.7779%
85	11.0605%	7.3240%	9.2228%	7.8562%	15.7785%	11.9947%
90	17.6902%	12.6470%	14.6577%	13.4530%	22.7224%	17.5353%

*Adjusted Base Rates

PAYROLL GROWTH: 2.65% per annum, compounded annually.

ADMINISTRATIVE EXPENSES: 1.00% of payroll.

TIMING OF DECREMENT AND PAY INCREASES: Middle of Year.

ASSUMED INTEREST RATE ON EMPLOYEE CONTRIBUTIONS: 2.00%

MARRIAGE ASSUMPTION: 100% married with the husband three years older than his wife.

SURVIVING CHILD BENEFITS ASSUMPTION: A small load is applied for surviving children.

MAXIMUM COVERED EARNINGS ASSUMPTION GROWTH: 2.65%

MODIFIED CASH REFUND: Benefits were valued with a twelve-year certain period for retirees and five years certain for active members to estimate the value of the modified cash refund feature.

ASSET VALUATION METHOD: Actuarial value, as developed in Schedule A. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected market value of assets, based on the assumed valuation rate of return. The amount recognized each year is 20% of the difference between market value and expected market value.

AMORTIZATION METHOD: Level Percentage of Payroll Method using 30-year closed amortization periods.

Schedule B: Statement of Actuarial Assumptions & Methods

VALUATION METHOD: The valuation is prepared on the projected benefit basis, which is used to determine the present value of each member's expected benefit payable at retirement, disability, or death. The calculations are based on the member's age, years of service, sex, compensation, expected future salary increases, and an assumed future interest earnings rate (currently 7.55%). The calculations consider the probability of a member's death or termination of employment prior to becoming eligible for a benefit and the probability of the member terminating with a service, disability, or survivor's benefit. The present value of the expected benefits payable to active members is added to the present value of the expected future payments to current benefit recipients to obtain the present value of all expected benefits payable to the present group of members and survivors.

The employer contributions required to support the benefits of HSPRS are determined following a level funding approach and consist of a normal contribution and an accrued liability contribution.

Under the entry age normal cost method, the actuarial present value of each member's projected benefits is allocated on a level basis over the member's compensation between the entry age of the member and the assumed exit ages. The portion of the actuarial present value allocated to the valuation year is called the normal cost. The actuarial present value of benefits allocated to prior years of service is called the actuarial accrued liability. The unfunded actuarial accrued liability represents the difference between the actuarial accrued liability and the actuarial value of assets as of the valuation date. The unfunded actuarial accrued liability is calculated each year and reflects experience gains/losses. The accrued liability contribution amortizes the balance of the unfunded actuarial accrued liability over a period of years from the valuation date.

Schedule C: Summary of Main Benefit & Contribution Provisions

The following summary presents the main benefit and contribution provisions of the System in effect June 30, 2022, as interpreted in preparing the actuarial valuation.

DEFINITIONS

Average Compensation	Average annual covered earnings of an employee during the four highest consecutive years of service.
Covered Earnings	Gross salary not in excess of the maximum amount on which contributions were required.
Fiscal Year	Year commencing on July 1 and ending June 30.
Credited Service	Service while a contributing member plus additional service as described below.
Unused Sick and Vacation Leave	Service credit is provided at no charge to members for unused sick and vacation time that has accrued at the time of retirement. A payment of up to 240 hours of leave may be used in the Average Compensation definition.
Additional Service	Additional service credit may be granted for service prior to July 1, 1958, active duty military service, and retroactive service

Schedule C: Summary of Main Benefit & Contribution Provisions

The maximum covered earnings for employers and employees over the last ten years are as follows:

EMPLOYER AND EMPLOYEE RATES OF CONTRIBUTION AND MAXIMUM COVERED EARNINGS

Fiscal Date From	Fiscal Date To	Employer Rate	Employee Rate	Maximum Covered Earnings*
1/1/2012	6/30/2012	35.21	7.25	
7/1/2012	6/30/2018	37.00	7.25	
7/1/2018	6/30/2022	49.08	7.25	

* Maximum covered earnings equal wages paid, not to exceed wages paid to the Commissioner of the Department of Public Safety (currently $183,240).

Effective July 1, 2022, additional contributions from SB 2659 and HB 1015 are estimated to be $3,600,000 combined.

BENEFITS

Superannuation Retirement

Condition for Retirement

A retirement allowance is payable to any member who retires and has attained age 55 and completed at least five years of membership service, or has attained age 45 and completed at least 20 years of creditable service, or has completed 25 years of creditable service regardless of age.

Any member who has attained age 63 shall be retired forthwith. Effective July 1, 2011, the Commissioner of Public Safety is authorized to allow a member who has attained age 63 to continue in active service. Such continued service may be authorized annually until the member attains age 65.

Amount of Allowance

The annual retirement allowance payable to a retired member is equal to:

1. A member's annuity which is the actuarial equivalent of the member's accumulated contributions at the time of his or her retirement, plus

2. An employer's annuity which, together with the member's annuity, is equal to 2-1/2% of his or her average compensation for each year of membership service, plus

3. A prior service annuity equal to 2-1/2% of average compensation for each year of prior service.

The aggregate amounts of (2) and (3) above shall not exceed 100% of average compensation, regardless of service, for retirements on or after January 1, 2000.

The minimum allowance for both service and disability retirement based on the following table for each year of creditable service, reduced if necessary as indicated below.

Service	Monthly Benefit
Less than 10 years	$250
10-15 years	$300
15 or more years	$500

The annual retirement allowance payable to a member who retires under condition (a) above prior to age 55 is computed in accordance with the above formula except that the employer's annuity and prior service annuity are reduced actuarially based on mortality table and interest rate used in the valuation.

Deferred Vested

Condition for Vesting

Any member who withdraws from service prior to his or her attainment of age 55 but after having completed five or more years of creditable service is entitled to receive, in lieu of a refund of his or her accumulated contributions, a retirement allowance commencing at age 55.

Amount of Allowance

The annual retirement allowance payable at age 55 is equal to:

1. A member's annuity which is the actuarial equivalent of the member's accumulated contributions at the time of his or her retirement, plus

2. An employer's annuity which, together with the member's annuity, is equal to 2-1/2% of his or her average compensation for each year of membership service, plus

3. A prior service annuity equal to 2-1/2% of average compensation for each year of prior service.

The aggregate amounts of (2) and (3) above shall not exceed 100% of average compensation, regardless of service, for retirements on or after January 1, 2000; 85% for retirements prior to January 1, 2000.

The minimum allowance for both service and disability retirement based on the following table for each year of creditable service, reduced if necessary as indicated below.

Service	Monthly Benefit
Less than 10 years	$250
10-15 years	$300
15 or more years	$500

Disability Retirement

Non-Duty-Related	Non-duty related disability benefits are available to vested members under the age of 55. Vested members age 55 or older are not eligible for disability benefits but may apply for service retirement benefits. For purposes of disability benefits, average annual compensation is calculated using the last two years of salary before retirement.
Duty-Related	If the member becomes permanently disabled due to sickness or injury caused or sustained as a direct result of duty, they may be eligible for duty-related disability retirement. They are covered for this benefit from the first day of employment if they have not reached age 55, regardless of their years of service. Duty-related disability retirement benefits are calculated at either 50 percent of average compensation of the last two years of salary before retirement (this portion is not taxable) or the non-duty-related disability retirement amount, whichever provides the higher benefit.

Death Benefits

Non-Duty-Related	If the member is vested, their spouse and dependent children may be eligible to receive certain statutory benefits. Claims for non-duty-related death benefits are calculated at 2.5 percent of average compensation for each year of service credit, as calculated under Option 9, Maximum Benefit. Under this option, 50 percent of the accrued benefit is payable to the member's spouse until death, with 25 percent of the accrued benefit payable to one dependent child and 50 percent of the accrued benefit payable for two or more dependent children (under age 19 and never married or under age 23 if a full-time student and never married). Upon application and approval by the Medical Board, benefits to a physically or mentally disabled child may continue as long as the disability exists.
Duty-Related	Coverage for duty-related death benefits begins on the first day of employment and is available to the member's spouse and dependent children regardless of their vesting status. If they are vested, their spouse and dependent children may be eligible to receive benefits under either non-duty or duty-related death benefit provisions, whichever provided the higher benefit. Claims for duty-related death benefits are calculated at 50 percent of average compensation, payable to the member's spouse until death, with 25 percent of average compensation payable to one dependent child and 50 percent of average compensation payable for two or more dependent children (under age 19 and never married or under age 23 if a full-time student and never married).

Upon application and approval by the Medical Board, benefits to a physically or mentally disabled child may continue as long as the disability exists.

Death After Retirement

Upon the death of a highway patrolman who has retired for service or disability and who has not elected any other optional form of benefit, his widow or her widower is eligible for a benefit equal to 50% of his or her retirement allowance and each child (but not more than 2) who has not attained age 19 (23 if a full-time student) is eligible for a benefit equal to 25% of his or her retirement allowance. The benefit to the widow is payable for life and to children until they attain age 19 (23 if a full-time student) or for life if they are totally and permanently disabled.

Refund of Contributions

Upon a member's termination of employment for any reason before retirement, his or her accumulated contributions, together with regular interest thereon, are refunded. Upon the death of a member who is not eligible for any other death benefit, his or her accumulated contributions, together with regular interest thereon, are paid to his or her beneficiary.

Effective July 1, 2016, the interest rate on employee contributions shall be calculated based on the money market rate as published by the Wall Street Journal on December 31 of each preceding year with a minimum rate of one percent and a maximum rate of five percent.

Normal Form of Benefit

For single retirees, the normal form of benefit is an allowance payable during the life of the member. For married retirees, the normal form of benefit is an allowance payable as described in Option 9 below. Upon death the benefits described above are payable.

Optional Benefits

A member upon retirement may elect to receive his allowance in one of the following forms which are computed to be actuarially equivalent to the applicable retirement allowance.

Option 1. Reduced allowance with the provision that if the pensioner dies before he receives the value of the member's annuity as it was at the time of retirement, the balance shall be paid to his or her beneficiary.

Option 2. Upon his or her death, his or her reduced retirement allowance shall be continued throughout the life of, and paid to, his or her beneficiary.

Option 3. Upon his or her death, 50% of his or her reduced retirement allowance shall be continued throughout the life of, and paid to, a designated beneficiary and the other 50% of his or her reduced retirement allowance to some other designated beneficiary.

Option 4. Upon his or her death, 75% of his or her reduced retirement allowance shall be continued throughout the life of, and paid to, a designated beneficiary.

Option 4A. Upon his or her death, 50% of his or her reduced retirement allowance shall be continued throughout the life of, and paid to, a designated beneficiary.

Option 4B. A reduced retirement allowance shall be continued throughout the life of the pensioner, but with the further guarantee of payment to the pensioner or his or her beneficiary for a specified number of years certain.

Option 4C. A member may elect any option with the added provision that the member shall receive, so far as possible, the same total amount annually (considering both HSPRS and Social Security benefits) before and after the earliest age at which the member becomes eligible for a Social Security benefit. This option was only available to those who retired prior to July 1, 2004.

Option 9. Upon his or her death, spouse will receive 50% of the benefit member was receiving for life. Each dependent child (under age 19 and never married or under age 23 if a full-time student and never married) will receive 25% of the benefit member was receiving with a maximum of 50% for the support and care of two or more children. Any contribution and interest remaining after member death and after all monthly benefits due to spouse and children have been paid will be refunded to designated beneficiaries. If the member marries after retirement while receiving benefits under this option, they may apply to Pop-Down to Option 2 to provide 100% beneficiary protection to new spouse, or Pop-down to Option 4 or Option 4A for other beneficiary protections for the new spouse. PLSO is available with this option, if eligible.

A member who elects Option 2, Option 4, or Option 4A, at retirement may revert to the normal form of benefit if the designated beneficiary predeceases the retired member or if the retired member divorces the designated beneficiary. A member who elects the normal form of benefit or Option 1 at retirement may select Option 2, Option 4, or Option 4A to provide beneficiary protection to a new spouse if married after retirement.

A member who qualifies for an unreduced retirement allowance may select a partial lump-sum option at retirement. Under this option, the retiree has the option of taking a partial lump-sum distribution equal to either 12, 24, or 36 times the base maximum monthly benefit. With each lump-sum amount, the base maximum monthly benefit will be actuarially reduced. A member selecting this option may also select any of the regular options except Option 1, the prorated single-life annuity, and Option 4-C, the Social Security leveling provision. The benefit is then calculated using the new reduced maximum benefit as a starting point in applying the appropriate option factors for the reduction.

Post-Retirement Adjustments In Allowances

The allowances of retired members are adjusted annually by an amount equal to (a) 3% of the annual retirement allowance for each full fiscal year of retirement prior to the year in which the member reaches age 60*, plus (b) 3% compounded for each year thereafter beginning with the fiscal year in which the member turns age 60*.

A prorated portion of the annual adjustment will be paid to the member, beneficiary, or estate of any member or beneficiary who is receiving the annual adjustment in a lump sum, but whose benefits are terminated between July 1 and December 1.

Those members who retired on or before July 1, 1999 received an ad hoc benefit increase in the amount of $3.50 per month per each full fiscal year of retirement through June 30, 1999 plus $1.00 per month for each year of credited service. The benefits were increased on July 1, 1999.

*this age will be reduced in five phases to age 55 if the actuary certifies that reducing the age will not result in the amortization period of the unfunded actuarial accrued liability exceeding 20 years.

CONTRIBUTIONS

Members contribute 7.25% of compensation and the employer contributes 49.08% of compensation. Funds from SB 2659 and HB 1015 are also provided.

Schedule D: Detailed Tabulations of the Data

RECONCILIATION OF DATA RECEIVED FROM PERS

Reconciliation of Data received from PERS	Active File			Pensioner File			Total
	Active	Inactives	Deferred Vested	Retirees	Disableds	Survivors	
From PERS	523	25	41	603	13	190	1,395
Refunded	(8)	(2)					(10)
Deceased				(18)		(9)	(27)
Certain Period End						(1)	(1)
Inactive	(1)	1					
Deferred Vested	(1)		1				
Duplicate*	(29)						(29)
Retired	(6)			6		1	1
For Valuation	478	24	42	591	13	181	1,329

*Also included in Pensioner File

STATUS RECONCILIATION FROM 2021 TO 2022

Reconciliation of Data from Last Year to This Year	Actives	Retirees	Disableds	Survivors	Deferred Vested	Inactives	Total
As of June 30, 2021	478	575	13	173	40	24	1,303
Retirement	(24)	35			(11)		
Disabled							
Death with Survivor		(14)		14			
Terminated Def Vested	(8)				13	(5)	
Inactives	(8)					8	
Return to Active Svc							
Refunded	(4)					(4)	(8)
Death No Survivor		(5)		(9)			(14)
Benefit Ended				(1)			(1)
Removed/Cleanup							
New / Pick-up	44			4		1	49
As of June 30, 2022	478	591	13	181	42	24	1,329

Schedule D: Detailed Tabulations of the Data

Retirants & Beneficiaries as of June 30, 2022
Tabulated by Year of Retirement

Valuation Year of Retirement Ending June 30	No.	Total Annual Benefits, excluding COLA	COLA	Total Annual Benefits	Average Monthly Total Benefit
2022	35	$1,855,702	$0	$1,855,702	$4,418
2021	39	2,144,428	28,177	2,172,604	4,642
2020	23	1,301,690	58,393	1,360,082	4,928
2019	26	1,172,818	90,239	1,263,057	4,048
2018	16	789,871	83,587	873,459	4,549
2017	18	802,918	105,158	908,077	4,204
2016	10	405,713	59,573	465,286	3,877
2015	15	703,343	143,366	846,708	4,704
2014	21	941,868	215,112	1,156,980	4,591
2013	16	644,831	167,800	812,631	4,232
2012	18	775,830	228,822	1,004,652	4,651
2011	20	883,693	289,371	1,173,064	4,888
2010	45	1,797,873	669,671	2,467,544	4,570
2009	30	1,259,147	496,945	1,756,092	4,878
2008	14	529,604	235,402	765,006	4,554
2007	20	671,391	297,859	969,249	4,039
2006	18	574,517	288,534	863,051	3,996
2005	20	600,369	324,324	924,692	3,853
2004	18	672,565	392,288	1,064,853	4,930
2003	9	198,337	101,870	300,207	2,780
2002	26	728,649	492,186	1,220,836	3,913
2001	21	611,286	426,624	1,037,911	4,119
2000	13	421,153	313,353	734,506	4,708
1999	14	400,097	318,312	718,409	4,276
1998	29	849,354	714,176	1,563,530	4,493
1997	27	677,738	598,613	1,276,350	3,939
1996	20	464,502	381,747	846,249	3,526
1995	15	372,059	358,237	730,296	4,057
1994	13	286,984	292,916	579,901	3,717
1993	17	333,680	337,477	671,157	3,290
1992	3	53,655	57,158	110,813	3,078
1991	5	69,809	82,592	152,401	2,540
1990	10	143,659	176,957	320,617	2,672
1989	1	20,314	25,856	46,170	3,847
1988	2	25,192	37,392	62,584	2,608
1987	82	1,295,004	1,748,286	3,043,290	3,093
1986	8	109,361	164,837	274,198	2,856
1985 and Prior	48	372,892	655,083	1,027,974	1,785
TOTAL	785	$25,961,895	$11,458,293	$37,420,188	$3,972

Schedule D: Detailed Tabulations of the Data

Schedule of Retired Members by Type of Retirement

Benefits Payable June 30, 2022

Amount of Original Monthly Benefit	Number of Rets.	Ret Type 1*	Ret Type 2*	Ret Type 3*
$1 – $500	25	2	2	21
501 – 1,000	92	7	3	82
1,001 – 1,500	67	21	1	45
1,501 – 2,000	92	73	5	14
2,001 – 2,500	103	95	1	7
2,501 – 3,000	89	85	1	3
3,001 – 3,500	98	93		5
3,501 – 4,000	62	60		2
4,001 – 4,500	54	53		1
4,501 – 5,000	26	25		1
Over 5,000	77	77		
Totals	785	591	13	181

*Type of Retirement
1 – Retirement for Age & Service
2 – Disability Retirement
3 – Survivor Payment

Schedule D: Detailed Tabulations of the Data

Schedule of Retired Members by Type of Option

Benefits Payable June 30, 2022

Amount of Original Monthly Benefit	Number of Rets.	Life	Option 1	Option 2	Option 3	Option 4	Option 4A	Option 4B	Option 4C*	Option 9	PLSO* 1 Year	PLSO* 2 Years	PLSO* 3 Years
$1 – $500	25	21		1						3			
501 – 1,000	92	80		1	1			2	1	8		1	1
1,001 – 1,500	67	44		3				1	3	19	2		7
1,501 – 2,000	92	22		9	2		1	2	3	56	1	1	9
2,001 – 2,500	103	12		8			1	2	1	80	10	3	14
2,501 – 3,000	89	8		9	1		2	4	2	65	5	5	32
3,001 – 3,500	98	13	1	10				1		73	8	5	33
3,501 – 4,000	62	5			1	1	3	3		49	8	8	19
4,001 – 4,500	54	1	2	5			2	2		42	5	6	17
4,501 – 5,000	26	1		1						24	4	1	12
Over 5,000	77	1		1	1					74	8	9	19
Totals	785	208	3	48	6	1	9	17	10	493	51	39	163

<u>Option Selected</u>

Life	-	Return of Contributions
Opt. 1	-	Return of Value of Member's Annuity
Opt. 2	-	100% Survivorship
Opt. 3	-	50%/50% Dual Survivorship
Opt. 4	-	75% Survivorship
Opt. 4A	-	50% Survivorship
Opt. 4B	-	Years Certain & Life
Opt. 4C	-	Social Security Leveling*
Opt. 9	-	Maximum Benefit with Pop-Down Provision
PLSO	-	Partial Lump Sum* (Reflects reduced monthly benefit)

*Included in other options

Schedule D: Detailed Tabulations of the Data

Retirant and Beneficiary Information June 30, 2022
Tabulated by Attained Ages

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20					5	$55,220	5	$55,220
20 – 24					1	$12,482	1	$12,482
25 – 29							0	$0
30 – 34					1	$25,316	1	$25,316
35 – 39					4	$68,927	4	$68,927
40 – 44	1	$49,224			2	$42,190	3	$91,414
45 – 49	14	$558,384	2	$29,696	4	$68,349	20	$656,429
50 – 54	47	$2,388,379	2	$74,757	4	$111,273	53	$2,574,409
55 – 59	59	$3,186,428	2	$52,142	7	$223,181	68	$3,461,751
60 – 64	109	$6,092,203	1	$34,460	5	$197,396	115	$6,324,059
65 – 69	120	$6,872,153			11	$359,991	131	$7,232,144
70 – 74	103	$5,662,094	2	$67,608	27	$721,339	132	$6,451,041
75 – 79	72	$3,958,447	1	$35,827	39	$1,118,136	112	$5,112,410
80 – 84	47	$2,457,661	1	$23,598	31	$830,254	79	$3,311,513
85 – 89	14	$761,227	1	$13,528	23	$612,539	38	$1,387,294
90 – 94	4	$176,744	1	$15,403	13	$313,218	18	$505,365
95					1	$29,208	1	$29,208
96							0	$0
97	1	$66,936					1	$66,936
98					1	$18,722	1	$18,722
99					1	$17,076	1	$17,076
100 & Over					1	$18,472	1	$18,472
Totals	591	$32,229,880	13	$347,019	181	$4,843,289	785	$37,420,188

Average Age: 69.2 years
Average Age at Retirement: 50.3 years

Schedule D: Detailed Tabulations of the Data

Total Active Member Data as of June 30, 2022
Tabulated by Attained Ages and Years of Service

Attained Age	Completed Years of Service									Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 & Over	No.	Payroll
Under 25		11								11	$ 625,962
25 to 29	1	59	1							61	3,424,770
30 to 34	1	44	17	8						70	4,086,236
35 to 39		17	14	26	8					65	4,143,634
40 to 44		15	6	30	37	7				95	6,870,937
45 to 49		4	1	14	29	25	8			81	6,602,560
50 to 54		6	1	7	17	21	15	1		68	5,578,476
55 to 59				1	2	8	10	3		24	2,200,106
60 to 64							3			3	226,069
65 to 69											0
70 & Over											0
Total Count	2	156	40	86	93	61	36	4		478	$ 33,758,750

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age:	41.1 years
Service:	12.2 years
Annual Pay:	$70,625

Schedule E: Analysis of Financial Experience

Gains & Losses in Accrued Liabilities
Resulting from Difference Between
Assumed Experience & Actual Experience
($ Thousands)

Type of Activity	$ Gain (or Loss) For Year Ending 6/30/2022	$ Gain (or Loss) For Year Ending 6/30/2021
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	$ (1,070.2)	$ 307.9
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	61.0	29.2
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	89.9	295.3
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(82.6)	(706.1)
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(4,679.6)	2,569.0
New Members / Rehires. Additional unfunded actuarial accrued liability will produce a loss.	(454.4)	(16.3)
Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.	4,065.3	17,784.2
Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.	706.5	2,322.4
Other. Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, etc.	(2,897.1)	(1,247.8)
Gain (or Loss) During Year From Financial Experience	$ (4,261.2)	$ 21,338.0
Non-Recurring Items. Adjustments for plan amendments, software changes, assumption changes, or method changes.	(13,327.6)	(2,545.6)
Composite Gain (or Loss) During Year	$ (17,588.8)	$ 18,792.4

Schedule F: Funding Policy of HSPRS

The purpose of the funding policy is to state the overall funding goals for the System, the benchmarks that will be used to measure progress in achieving those goals, and the methods and assumptions that will be employed to develop the benchmarks.

I. Funding Goals

The objective in requiring employer and member contributions is to accumulate sufficient assets during a member's employment to fully finance the benefits the member receives throughout retirement. In meeting this objective, the System will strive to meet the following funding goals:

- To maintain an increasing ratio of system assets to accrued liabilities and reach an 80 percent minimum funded ratio in 2042;
- To maintain adequate asset levels to finance the benefits promised to members;
- To develop a pattern of stable contribution rates when expressed as a percentage of member payroll as measured by valuations prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, with a minimum employer contribution equal to the normal cost determined under the Entry Age Normal funding method;
- To provide intergenerational equity for taxpayers with respect to system costs; and
- To fund benefit improvements through increases in contribution rates in accordance with Article 14, § 272A, of the Mississippi Constitution.

II. Benchmarks

To track progress in achieving the previously outlined funding goals, the following benchmarks will be measured annually as of the actuarial valuation date (with due recognition that a single year's results may not be indicative of long-term trends):

- **Funded ratio** – The funded ratio, defined as the actuarial value of system assets divided by the System's actuarial accrued liability, should be increasing over time, before adjustments for changes in benefits, actuarial methods, and/or actuarial assumptions, with a target of at least 80 percent in 2042. If the funded ratio is projected to be less than 60 percent in 2042 or if the funded ratio is projected to be less than 70 percent following three consecutive annual actuarial valuations, a contribution rate increase will be determined that is sufficient to generate a funded ratio of 90 percent in 2042. If a funded ratio of 100 percent or more is attained and is projected to remain above 100 percent for_the ensuing 30 years, a reduced contribution pattern will be established provided the projected funded ratio remains at or above 100 percent in every future year.
- **Contribution rate history** – Employer and member contribution rates should be level from year to year when expressed as a percent of active member payroll unless the projected funded ratio reaches a level that triggers a change in contribution rates. The initial employer contribution rate set under this policy as revised June 19, 2013, was 37.00 percent of active member payroll effective July 1, 2013. This rate was changed effective July 1, 2018 to 49.08 percent.
- **Unfunded Actuarial Accrued Liability (UAAL) amortization period** – The amortization period for the System's UAAL should be declining over time.

Schedule F: Funding Policy of HSPRS

III. Methods and Assumptions

The actuarial funding method used to develop the benchmarks will be entry age normal. The method used to develop the actuarial value of assets will recognize the underlying market value of the assets by spreading each year's unanticipated investment income (gains and losses) over a five-year smoothing period (20 percent per year), as adopted by the Board of Trustees of the Public Employees' Retirement System of Mississippi (PERS).

The actuarial assumptions used will be those last adopted by the PERS Board based upon the advice and recommendation of the System's actuary. The actuary shall conduct an investigation into the System's experience at least every two years on a rolling four year basis, and utilize the results of the investigation to form the basis for those recommendations.

The PERS Board will have an audit of the System's actuarial valuation results conducted by an independent actuary at least every six years. The purpose of such a review is to provide a critique of the reasonableness of the actuarial methods and assumptions in use and the resulting actuarially computed liabilities and contribution rates.

IV. Funding Policy Review

The funding policy components and triggers will be reviewed annually following the annual actuarial valuation and in conjunction with the annual projection report and will be amended as necessary following each experience investigation conducted by the Board.

Schedule G: Glossary

Actuarial Accrued Liability. 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".

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

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 Equivalent. A series of payments is called on actuarial equivalent of another series of payments if the two series have the same actuarial present value.

Actuarial Present Value. 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.

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.

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

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

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets.

Valuation Assets. The value of current plan assets recognized for valuation purposes. Generally based on book value plus a portion of unrealized appreciation or depreciation.

Schedule H: History of HSPRS Plan Provisions

Since 1958, the benefit structure of the Highway Safety Patrol Retirement System (HSPRS) of Mississippi has undergone significant changes as noted in the table below.

Fiscal Year Beginning	Benefit Modifications
July 1, 1958	• Mississippi Highway Safety Patrol Retirement System created.
July 1, 1966	• Removed limit of $200 per month for disability retirement payments. • Eliminated reduction in retirement benefits resulting from Social Security payments. • Provided same survivor benefits to disability retirant's beneficiaries as those provided for service retirant's beneficiaries.
July 1, 1974	• Authorized military service credit (not to exceed 4 years maximum unless proof furnished member was retained by causes beyond his control).
July 1, 1975	• Provided additional benefit payments (13th Checks) to retired patrolmen. • Authorized payment of benefits to spouses and families of patrolmen who die after serving minimum period or who are killed in line of duty.
July 1, 1976	• Provided benefits to widows of highway patrolmen who were killed in line of duty prior to enactment of highway patrol retirement system.
July 1, 1977	• Provided that a highway patrolman who reenters service with the highway safety patrol may receive retirement credit for prior years upon repayment of amount refunded and interest from date of refund to repayment.
July 1, 1979	• Provided guaranty of benefits and maximum retirement allowance in the highway safety patrol retirement system.
July 1, 1980	• Provided a minimum service and disability retirement benefit for members of MHSPRS. • Provided any member who served in maritime service during periods of hostility in WWII shall be allowed credit for maritime service. • Provided all members who served in armed forces during war or military conflict or in maritime service during periods of hostility in WWII shall be allowed credit regardless of when they retired.
July 1, 1982	• Provided employer pickup of member contributions. • Increases additional payment (13th check) to 1/2 of annual percentage change of CPI not to exceed 2 1/2%.
July 1, 1984	• Provided that unused leave shall be treated as creditable service under MHSPRS.
July 1, 1985	• Increased 13th check to an amount equal to 2 1/2% of annual percentage change in CPI for years thru 6-30-85; and for subsequent years 100% of annual percentage change in CPI not to exceed 2 1/2%; provided an additional amount could be paid in increments of 1/4 of 1% to a maximum of 1 1/2% provided there were sufficient gains in excess of accrued liability.
July 1, 1986	• Reduced to 5 years the required years to qualify to retire at age 55. • Provided full retirement with 30 years creditable service regardless of age.

Schedule H: History of HSPRS Plan Provisions

Fiscal Year Beginning	Benefit Modifications
	• Reduced the number of years which determine average compensation to 4 highest consecutive years. • 3% reduction in retirement allowance shall apply to the lesser of: each year of age below age 55 or each year less 30 years of creditable service. • Provided retirement allowance shall not exceed 85% of average compensation. • Provided mandatory retirement and termination of membership at age 60. • Provided no monthly benefit payment may be made for a period of time in excess of that allowed by federal law. • Provided an ad hoc increase of 3% to retirees who retired prior to July 1, 1986, and average compensation was based on 5 consecutive years of earned compensation instead of 4. • Provided that a retiree may elect by an irrevocable agreement to receive additional payment (13th check) in equal installments not to exceed 6 months. • Amended section 25-13-13 on death benefits to conform to section 25-13-11 allowing 5-year vesting by deleting 10-year requirement. • Provided a one-time early retirement for any member who had at least 20 years of creditable service; exempted early service retirement allowance from the 3% reduction if member is below age 55; allowance was based on current fiscal year's salary.
July 1, 1989	• Provided survivor benefits from day one of employment to a spouse and/or dependent children of a member who is either killed in the line of performance of duty or dies as a direct result.
July 1, 1990	• Amended section 25-13-11 to reduce from 30 to 25 numbers of years required for full retirement regardless of age. • Provided a 10% ad hoc increase in annual retirement allowance to retired members and beneficiaries with minimum benefits of $500.00 if retired with 15 or more years of service credit; $300.00 per month if retired with 10 or more but less than 15 years credit; $250.00 per month to anyone with less than 10 years credit; beneficiaries to receive a minimum of $250.00 per month. • Established options for service and disability retirees retiring 7-1-90 or later. • Provided an active member qualified for retirement may pre-select an option. • Provided option selection will take precedence over automatic survivor benefits.
July 1, 1991	• Allowed sworn agents of MS Bureau of Narcotics, who were employed by such bureau prior to December 1, 1990, regardless of age, may be employed as enforcement officers, if they meet all other qualifications. Those employed retain all compensatory, personal, and sick leave accrued. • Provided cost-of-living payment (13th check) shall be cumulative to conform to PERS law. • Provided regular interest shall be credited annually to member's employee contribution account.

Schedule H: History of HSPRS Plan Provisions

Fiscal Year Beginning	Benefit Modifications
July 1, 1992	• Provided benefits to dependent children to age 23 if they remain in school.
July 1, 1997	• Allowed retired Highway Patrolmen to irrevocably elect to have COLA (13th check) paid in twelve (12) equal installments.
July 1, 1999	• Provide that if the member and beneficiary die before having received in benefits an amount equal to the total of the contributions and accrued interest of the member at the time of death, that the balance will be refunded to the designated beneficiary or by statutory succession. • Provided that payment of death benefits shall be in accordance with the statutory provisions set forth as of the date of death of the member. • Authorized a retiree who retired before or after July 1, 1999, to be eligible for the same "pop-up" and "pop-down" provisions of PERS; and recalculates the benefits of those retirees who selected Option 5 "pop-up" protection. • Authorized an ad hoc benefit adjustment to each member of the Mississippi Highway Safety Patrol Retirement System (MHSPRS) retired on or before July 1, 1999, in the amount of $3.50 per month for each full fiscal year of retirement through June 30, 1999, plus $1.00 per month for each year of service credit used in the calculation of benefits. • Removed from consideration in the base COLA the requirement that the Consumer Price Index (CPI) have increased by at least 2 ½%. • Provided that a prorated portion of the annual adjustment will be paid to the beneficiary or estate of any member or beneficiary who is receiving the annual adjustment in a lump sum, but who dies between July 1 and December 1 in those cases where no more monthly benefits will be paid after the member's or beneficiary's death. This prorated portion will be equal to the amount that such recipient would have received had he or she elected to receive the annual adjustment for the year on a monthly basis.
July 1, 2000	• Deleted the maximum option where no additional benefits are payable after death. The statute retains Option 9, which provides a maximum option with a 50% survivor benefit with no reduction in the member's retirement allowance. • Provided for a new retirement option that would allow a member who is eligible for an <u>unreduced retirement benefit</u> to select a partial lump-sum option at retirement. • Allowed the Cost of Living Adjustment to be calculated on <u>all</u> full fiscal years in retirement, not just the years since the retirant's last retirement. • Provided for the same service credit for active duty, as is allowed in PERS and is no longer limited to active duty service during times of conflict. This amendment applies to all persons who have retired from the Highway Patrol and who qualify for such credit, whether they retired before or after July 1, 2000. This provision, however, did not require any back payments. • Changed the maximum limitation on the retirement benefit from 85% of the average compensation regardless of the years of service to 100% of the average compensation.

Schedule H: History of HSPRS Plan Provisions

Fiscal Year Beginning	Benefit Modifications
July 1, 2002	• Provided that Option 4-C, Social Security Leveling Option, will no longer be available to members retiring on or after July 1, 2004. • Provided that any member who has five years of service (reduced from 10 years) may apply for a regular non-duty related disability retirement allowance. • Provided for a compounded COLA, based on 3% of the retirement allowance for each full fiscal year in retirement with the 3% compounding beginning at age 60; to further provide that the age at which the compounding begins will be reduced gradually to age 55 as such can be accomplished without causing the unfunded accrued liability amortization period to exceed 20 years; to further provide that a pro-rated share of the lump-sum COLA will be paid if a benefit terminates before December 1 of the fiscal year. Also, allows the Board to grant a change in the manner the COLA is paid if a hardship is shown.
July 1, 2004	• Conformed the MHSPRS COLA section (except for the age of compounding) to the provisions in PERS. • Eliminated the re-marriage penalty which terminates a spouse's benefit, currently provided in subsections (1) and (3), upon his/her remarriage. This amendment also allows those spouses whose benefits have been previously terminated to apply to have the benefits reinstated prospectively.
July 1, 2008	• Allowed a retroactive effective date (up to 3 months) for retirees who revert from Option 2 or Option 4A to the maximum option following the death of the named beneficiary.
July 1, 2011	• Option 4, a 75% joint and survivor annuity, made available to members who retire on or after July 1, 2011 • For members hired on or after July 1, 2011, the mandatory retirement age was increased from age 60 to age 63.
July 1, 2016	• The interest rate on employee contributions shall be calculated based on the money market rate as published by the Wall Street Journal on December 31 of each preceding year with a minimum rate of one percent and a maximum rate of five percent. • The early retirement formula shall be reduced by an actuarially determined percentage or factor (rather than a fixed 3%) for each year of age below 55 or for each year of service below 25, whichever is less.