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PERS
of MISSISSIPPI

Report on the Annual Valuation of the Public Employees' Retirement System of Mississippi

Prepared as of June 30, 2021

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CONSULTING, LLC
The experience and dedication you deserve

December 6, 2021

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 Public Employees' Retirement System (PERS) of Mississippi. The purpose of the valuation is to:

- Measure the System's funding progress as of the valuation date,
- To determine the unfunded actuarial accrued liability amortization period beginning July 1, 2021 using the current Fixed Contribution Rate (FCR) of 17.40% of payroll,
- To determine the actuarially determined contribution (ADC) for the fiscal year ending June 30, 2024 using the assumptions and methods in the Board's funding policy,
- To project the System's funding progress for the next thirty years and provide clear reporting and risk analysis of the funding metrics as outlined in the Board's funding policy using a "Signal Light" approach, and
- To assist the Board in determining whether an increase or decrease is needed in the Fixed Contribution Rate.

The results may not be applicable for other purposes. The date of the valuation was June 30, 2021.

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 the valuation results on page 1 and the projection results on page 6.

Since the previous valuation, the Board adopted new actuarial assumptions based on the experience investigation for the four-year period ending June 30, 2020. The results of this study were presented to the Board in April, 2021 and the Board adopted all of the demographic assumption recommendations (e.g., rates of mortality, retirement, and withdrawal) and the economic assumption recommendations (e.g., investment return, wage inflation, and price inflation assumption) at its August, 2021 meeting. In addition, the Board amended the Funding Policy to set the long-term investment return assumption to 7.55 percent and, upon approval by the Board, the assumption will be reduced until it reaches the rate recommended by the actuary in the most recent experience study using investment gains.

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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.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information, but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments that we believe would be appropriate due to the pandemic.

In order to prepare the results in this report we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

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, EA, FCA, MAAA
Chief Executive Officer

Ben Mobley, ASA, FCA, MAAA
Consulting Actuary

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Section I: Executive Summary

1. This report, prepared as of June 30, 2021, 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 benefit amounts reflect any benefit increases granted to retirees as of July 1, 2021.

VALUATION DATE	June 30, 2021	June 30, 2020
Investment Return Assumption	**7.55%**	**7.75%**
Active members included in valuation		
Number	145,673	149,855
Annual compensation	$ 6,246,076,841	$ 6,287,441,467
Retirees		
Number	112,158	109,881
Annual allowances	$ 2,875,483,858	$ 2,755,593,924
Assets		
Market related actuarial value	$ 30,768,251,000	$ 28,629,205,000
Market value of assets (MVA)	$ 35,216,597,000	$ 27,827,394,000
Unfunded actuarial accrued liability (UAAL)	$ 19,436,044,743	$ 18,725,258,570
Funded Ratio based on actuarial value	61.3%	60.5%
Employer Fixed Contribution Rate (FCR)		
Normal Cost*	1.77%	1.34%
Accrued liability	15.63	16.06
Total	17.40%	17.40%
Payment period based on the FCR	50.9 years	37.1 years
Actuarially Determined Contribution (ADC) Rate		
Normal Cost*	1.77%	1.34%
Accrued liability	19.72	18.15
Total	21.49%	19.49%
Amortization period for ADC	26.7 years	27.7 years
ADC Ratio to Fixed Contribution Rate	123.51%	112.01%
Unfunded actuarial accrued liability based on MVA	$ 14,987,698,743	$ 19,527,069,570
Funded Ratio based on market value	70.1%	58.8%
Payment Period based on the FCR	25.8 years	41.7 years

* Includes load for administrative expenses. See page 16 for more contribution rate detail.

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

3. Comments on the valuation results are given in Section IV, comments on the experience and actuarial 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 and Section VII.

4. Schedule A of this report presents the development of the assets. The estimated investment return for the plan year ending June 30, 2021 on a market value of assets basis was 32.17% and on an actuarial value of assets basis was 12.47%. These can be compared to the assumed rate of return for the period of 7.75%.

5. Schedule B details the actuarial assumptions and methods employed. Since the previous valuation, various economic and demographic assumptions have been revised. The changes are summarized below and shown in more detail in Schedule B:
   - The investment rate of return assumption was changed from 7.75% to 7.55%.
   - The price inflation assumption was reduced from 2.75% to 2.40%.
   - The wage inflation assumption was reduced from 3.00% to 2.65%.
   - The assumed load for administrative expenses was increased from 0.25% to 0.28% of payroll.
   - Withdrawal rates, pre-retirement mortality rates, disability rates and service retirement rates were also adjusted to reflect actual experience more closely.
   - The percentage of active member disabilities assumed to be in the line of duty was increased from 9% to 12%.
   - The percentage of active member deaths assumed to be in in the line of duty was decreased from 6% to 4%.
   - Changes were made to the Mortality Table for both healthy and disabled lives.

6. Schedule C gives a summary of the benefit and contribution provisions of the plan. There have been no changes since the previous valuation.

7. The employer contribution rate, or Fixed Contribution Rate (FCR), of 17.40% of annual compensation was approved by the Board in 2021 for the fiscal year ending June 30, 2023 and has been the contribution rate for employers since July 1, 2019. As shown on page 1 of the report, the amortization period to pay off the Unfunded Actuarial Accrued Liability (UAAL) using the FCR is just over 50 years, which is a snapshot view of the UAAL as of the valuation date of June 30, 2021. This calculation of the amortization period does not take into consideration the smoothing in of the positive investment gains that the System experienced for fiscal year end June 30, 2021.

8. In addition, as shown on page 1 of the report, the Actuarially Determined Contribution (ADC) Rate for the 2021 valuation year is 21.49% of annual compensation and the ratio of the ADC to the FCR is calculated at 123.51% as of June 30, 2021. Per the Board's Funding Policy, which is provided in Schedule F, this actuarial metric is in the Red Status as the ratio exceeds 110%.

9. The Board's decision earlier this year to keep the FCR at 17.40% of annual compensation was based on the thorough projection analysis that the Board reviewed throughout 2021 that demonstrated that the smoothing in of the positive investment gain that the System experienced for fiscal year end June 30, 2021 would decrease the amortization period quicker and would decrease the ADC/FCR ratio closer to 100% over the next four valuations. **Therefore, beginning this year, we have combined the valuation report and projection report for PERS so that all current and projected metrics are shown in one report.**

10. The projection results, shown beginning in Section IX, 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:

    - Preservation of the defined benefit structure for providing lifetime benefits to the PERS' membership,

- Maintain an increasing trend in the funded ratio over the projection period with an ultimate goal of being 100% funded,
- Ensure benefit improvements are funded through increases in contribution requirements in accordance with Article 14, S 272A, of the Mississippi Constitution.
- Contribution rate stability as a percentage of payroll (Fixed Contribution Rate – FCR),
- Require clear reporting and risk analysis of the metrics by the actuary as outlined in Section II of the policy using a "Signal Light" approach to assist the Board in determining whether increases or decreases are needed in the employer contribution rate.

11. For PERS, if any one of the following metrics are in the Red Signal Light status in conjunction with the annual valuation report and the projection report, the actuary will determine and recommend to the Board an employer contribution rate increase to consider that is sufficient enough to get all three metrics back into the Green Signal Light status.

- Funded Ratio – defined as the actuarial value of assets divided by the actuarial accrued liability. One of the funding goals is to have an increasing funded ratio over the projection period with an ultimate goal of having a 100% funded ratio. The Board sets the Signal Light definition as follows:

Status	Definition
Green	**Funded Ratio above 80% in 2047**
Yellow	**Funded Ratio between 65% and 80% in 2047**
Red	**Funded Ratio below 65% in 2047**

- Cash flow as a percentage of assets – defined as the difference between total contributions coming into the trust and the benefit payments made to retirees and beneficiaries going out of the trust as a percentage of beginning year market value of assets. Over the projection period, this percentage will fluctuate from year to year so for Signal Light testing, the net cash flow percentage over the entire projection period will be tested. The Board sets the Signal Light definition as follows:

Status	Definition
Green	Net Cash Flow Percentage above negative 5.80% (-5.80%) during the projection period
Yellow	Net Cash Flow Percentage between negative 5.80% (-5.80%) and negative 7.55% (-7.55%) during the projection period
Red	Net Cash Flow Percentage below negative 7.55% (-7.55%) during the projection period

- Actuarially Determined Contribution (ADC) – defined as the contribution requirement determined by the actuary using a contribution allocation procedure based on the principal elements disclosed in Section III of the funding policy:
  1. Actuarial Cost Method
  2. Asset Smoothing Method
  3. Amortization Method

The calculation of the ADC will be determined during the actuarial valuation. The ratio of the ADC to the fixed contribution rate (ADC/FCR) as set by the Funding Policy will be tested. The Board sets the Signal Light definition as follows:

Status	Definition
Green	ADC ratio at or below 100% of fixed contribution rate
Yellow	ADC ratio between 100% and 110% of fixed contribution rate
Red	ADC ratio above 110% of fixed contribution rate

12. A summary of the estimated metrics from the projection results for the next five years and in the long-term are shown in the following two tables below. More details will be shown beginning in Section IX but as you can see from the first table below, the funded ratio, amortization period and ADC/FCR ratio improve rather quickly over the next five years.

Valuation Year	UAAL ($ in Millions)	Funded Ratio	Amortization Period	Cash Flow %	ADC/FCR Ratio
2021	$19,436	61.3%	51 years	(4.5)%	123.5%
2022	$18,455	64.0%	41 years	(4.7)%	118.4%
2023	$17,545	66.5%	34 years	(4.8)%	113.3%
2024	$16,535	69.0%	28 years	(4.9)%	107.8%
2025	$15,251	71.9%	23 years	(5.0)%	100.9%
2026	$15,274	72.4%	22 years	(5.2)%	101.5%

Metric	2021 Baseline Projection (7.55%)	2021 Status	2020 Baseline Projection (7.75%)	2020 Status
Funding Ratio in 2047	93.5%	Green	67.6%	Yellow
Cash Flow as a Percentage of Assets	-5.65%	Green	-6.20%	Yellow
ADC/FCR Ratio from 2021 Valuation	123.5%	Red	112.0%	Red
ADC/FCR Ratio from 2025 Valuation	100.9%	Yellow	122.0%	Red

As shown above, the ADC/FCR ratio is in “Red Status” for the 2021 valuation and per the Funding Policy, the actuary should recommend an increase in the Fixed Contribution Rate. However, the ADC/FCR ratio is projected to decrease closer to 100% over the next four valuations as the investment gains from the 2021 valuation are fully recognized. Therefore, there is no recommendation for an increase in the Fixed Contribution Rate of 17.40% of annual compensation at this time. However, the Board should review the Sensitivity Analysis section of this report to understand the volatility that may occur in the projections if investment experience is less than expectations going forward.

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				Retired Lives				Valuation Results ($ millions)		
	Number	Payroll ($ millions)	Average Salary	% increase from previous year	Number	Active/ Retired Ratio	Annual Benefits ($ millions)	Benefits as % of Payroll	Accrued Liability	Valuation Assets	UAAL
2012	162,311	$5,858	$36,090	2.6	86,829	1.9	$1,752.6	29.9	$34,493	$19,993	$14,500
2013	161,744	5,824	36,005	(0.2)	90,214	1.8	1,874.7	32.2	35,543	20,491	15,052
2014	161,360	5,835	36,159	0.4	93,504	1.7	1,998.3	34.2	37,015	22,570	14,445
2015	157,215	5,905	37,559	3.9	96,338	1.6	2,116.3	35.8	40,364	24,387	15,977
2016	154,104	6,023	39,081	4.1	99,483	1.5	2,249.0	37.3	41,997	25,185	16,812
2017	152,382	6,038	39,626	1.4	102,260	1.5	2,374.7	39.3	43,166	26,364	16,802
2018	150,687	5,999	39,813	0.5	104,973	1.4	2,500.8	41.7	44,396	27,456	16,940
2019	150,651	6,145	40,789	2.5	107,844	1.4	2,635.0	42.9	46,007	28,025	17,982
2020	149,855	6,287	41,957	2.9	109,881	1.4	2,755.6	43.8	47,354	28,629	18,725
2021	145,673	6,246	42,877	2.2	112,158	1.3	2,875.5	46.0	50,204	30,768	19,436

The active membership declined for the ninth consecutive year while the number of retirees increased by 2.1% for the 2021 fiscal year. The ratio of actives to retirees declined to 1.3 for the 2021 fiscal year. The Unfunded Actuarial Accrued Liability (UAAL) increased by $711 million for this valuation.

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, 2021 upon which the valuation was based. Detailed tabulations of the data are given in Schedule D.

Active Members

Employers	Number of Employers	Number	Payroll	Group Averages		
				Salary	Age	Service
State Agencies	103	25,325	$1,076,040,014	$42,489	45.9	10.7
State Universities	9	17,114	996,451,048	58,224	43.5	9.8
Public Schools	140	60,108	2,403,327,174	39,983	44.7	10.9
Community/Junior Colleges	15	5,959	300,434,410	50,417	46.9	11.6
Counties*	88	14,620	572,143,978	39,134	47.2	9.8
Municipalities	242	15,471	595,147,054	38,469	44.2	10.0
Other Political Subdivisions	258	7,076	302,533,163	42,755	45.0	9.0
Total in PERS	855	145,673	$6,246,076,841	$42,877	45.1	10.5

*There are 82 counties; however, 3 counties have multiple agencies.

The total number of active members includes 75,790 vested members and 69,883 non-vested members.

Retired Lives

Type of Benefit Payment	No.	Annual Benefits	Group Averages	
			Benefit	Age
Retirement	93,630	$2,517,980,876	$26,893	71.4
Disability	6,394	129,746,233	20,292	64.4
Survivor	12,134	227,756,749	18,770	68.5
Total in PERS	112,158	$2,875,483,858	$25,638	70.6

Section II: Membership Data

Deferred Vested/Inactive Lives

Type of Member	No.	Deferred Benefits	Outstanding Refunds
Deferred Vested - Benefit Provided	14,759	$ 126,691,630	N/A
Deferred Vested – Missing Benefit	978	N/A	$ 38,050,989
Vested – Pending Retirements	1,150	34,356,408	N/A
Inactive	68,026	N/A	335,839,653
Total in PERS	84,913	$ 161,048,038	$ 373,890,642

For the liability in this valuation, deferred vested participants with benefits provided are valued assuming a retirement age of 60 for Tiers 1, 2, and 3 and age 65 for Tier 4. There are 1,150 records determined to be possible "pending retirements" based on the provided member status; these records are valued by assuming immediate benefit commencement.

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, 2021 and, for comparison purposes, as of the immediately preceding valuation date of June 30, 2020. 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
PUBLIC EMPLOYEES' RETIREMENT SYSTEM OF MISSISSIPPI

	JUNE 30, 2021	June 30, 2020
ASSETS		
Current actuarial value of assets:		
Annuity Savings Account	$ 5,728,172,130	$ 5,710,182,245
Annuity Reserve	7,074,949,003	6,719,505,570
Employers' Accumulation Account	17,965,129,867	16,199,517,185
Total current assets	$ 30,768,251,000	$ 28,629,205,000
Future member contributions to Annuity Savings Account	$ 3,787,600,399	$ 3,634,111,165
Prospective contributions to Employer's Accumulation Account		
Normal contributions	$ 627,058,288	$ 440,131,241
Unfunded actuarial accrued liability contributions	19,436,044,743	18,725,258,570
Total prospective contributions	$ 20,063,103,031	$ 19,165,389,811
Total assets	$ 54,618,954,430	$ 51,428,705,976
LIABILITIES		
Present value of benefits payable on account of present retired members and beneficiaries	$ 31,821,654,514	$ 30,220,083,007
Present value of benefits payable on account of active members	20,764,222,444	19,383,269,836
Present value of benefits payable on account of inactive members for service rendered before the valuation date	2,033,077,472	1,825,353,133
Total liabilities	$ 54,618,954,430	$ 51,428,705,976

Section III: Valuation Balance Sheet

BREAKDOWN OF TOTAL AND ACCRUED LIABILITIES
AS OF JUNE 30, 2021

	Total Liability	Accrued Liability
Active Members		
Retirement	$ 18,038,309,816	$ 15,573,726,336
Death	286,640,859	199,026,322
Disability	413,744,942	265,837,767
Termination	2,025,526,827	310,973,332
Total	$ 20,764,222,444	$ 16,349,563,757
Retirees		
Retirement	$ 28,552,224,489	$ 28,552,224,489
Survivor	1,957,416,165	1,957,416,165
Disability	1,312,013,860	1,312,013,860
Total	$ 31,821,654,514	$ 31,821,654,514
Deferred Vested Members	1,546,109,975	1,546,109,975
Inactive Members	486,967,497	486,967,497
Total Actuarial Values	$ 54,618,954,430	$ 50,204,295,743
Actuarial Value of Assets		30,768,251,000
Unfunded Actuarial Accrued Liability		$ 19,436,044,743

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, 2021.

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 plan. 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 $5,728,172,130. The assets credited to the Annuity Reserve were $7,074,949,003 and the assets credited to the Employer's Accumulation Account totaled $17,965,129,867. Current actuarial assets as of the valuation date equaled the sum of these three funds, $30,768,251,000. Future member contributions to the Annuity Savings Account were valued to be $3,787,600,399. Prospective contributions to the Employer's Accumulation Account were calculated to be $20,063,103,031 of which $627,058,288 is attributable to service rendered after the valuation date (normal contributions) and $19,436,044,743 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 $54,618,954,430 as of June 30, 2021.

Total Liabilities

The present value of benefits payable on account of presently retired members and beneficiaries totaled $31,821,654,514 as of the valuation date. The present value of future benefit payments on behalf of active members amounted to $20,764,222,444. In addition, the present value of benefits for inactive members, due to service rendered before the valuation date, was calculated to be $2,033,077,472.

Therefore, the balance sheet shows the present value for all prospective benefit payments under the System to be $54,618,954,430 as of June 30, 2021.

Section 25-11-123(a)(1) of State law requires that active members contribute 9.00% of annual compensation to the System.

Section IV: Comments on Valuation

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. The PERS Board of Trustees increased the employer contribution rate from 15.75% to 17.40% of annual compensation effective for the fiscal year beginning July 1, 2019. The Board voted in 2021 to maintain the employer contribution rate of 17.40% of annual compensation through the fiscal year ending June 30, 2023. Since the amortization period is calculated on an open basis, the amortization period for the June 30, 2021 valuation is 50.9 years, compared to 37.1 years for the previous valuation.

The primary reason for the increase in the amortization period was due to the change in assumptions from the recommendations of the experience study for the 4-year period ending on June 30, 2020, especially the decrease in the wage inflation assumption. There were also losses due to aggregate demographic experience for PERS. These losses were somewhat offset by the gain due to investment earnings on the actuarial value of assets basis better than expected (12.47% vs. 7.75%).

See Section VI for a reconciliation of the amortization periods from last year to this year and 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) coincide 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. Detail on the derivation of the experience gain/(loss) for the year ended June 30, 2021 and for the previous valuation is shown below.

		2021 Results $ millions	2020 Results $ millions
(1)	UAAL* as of beginning of year	$ 18,725.3	$ 17,982.2
(2)	Total Normal cost from last valuation	667.9	661.1
(3)	Total Employee and Employer Contributions	1,764.6	1,766.5
(4)	Interest accrual: [[(1) + (2)] x .0775] - [(3) x .03875]	1,434.5	1,376.3
(5)	Expected UAAL before changes: (1) + (2) – (3) + (4)	19,063.1	18,253.1
(6)	Change due to plan amendments	0.0	0.0
(7)	Change due to new actuarial assumptions or methods	1,405.0	0.0
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 20,468.1	$ 18,253.1
(9)	Actual UAAL as of end of year	$ 19,436.0	$ 18,725.3
(10)	Gain/(loss): (8) – (9)	$ 1,032.1	$ (472.2)
(11)	Gain/(loss) as percent of actuarial accrued liabilities at start of year	2.2%	(1.0)%

*Unfunded actuarial accrued liability.

Valuation Date June 30	Actuarial Gain/(Loss) as a % of Beginning Accrued Liabilities
2016	(1.4)%
2017	1.1
2018	0.5
2019	(0.9)
2020	(1.0)
2021	2.2

Section VI: Fixed Contribution Rate (FCR)

1. 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	2021 Valuation	2020 Valuation
Normal Cost:		
Service retirement benefits	8.80%	8.42%
Disability benefits	0.31	0.40
Survivor benefits	0.19	0.20
Total	9.30%	9.02%
Member Contributions:	9.00%	9.00%
Less future refunds	(1.19)	(1.07)
Available for benefits	7.81%	7.93%
Employer Normal Cost	1.49%	1.09%
Administrative Expense Load	0.28%	0.25%
Total Employer Normal Cost	1.77%	1.34%
Unfunded Actuarial Accrued Liabilities (50.9 years level % of payroll amortization*)	15.63%	16.06%
Total Computed Employer Contribution Rate	17.40%	17.40%

* Amortization period a year ago was 37.1 years.

2. The Board maintained a Fixed Contribution Rate (FCR) of 17.40% of annual compensation for the fiscal year ending June 30, 2023 and set the amortization period to open-ended. Thirty-year projections are completed to determine if an increase or decrease in the employer contribution rate is warranted according to the metrics set forth in the funding policy. Please see the projection results beginning in Section IX.

Section VI: Fixed Contribution Rate (FCR)

3. The components of the change in the computed unfunded actuarial accrued liability amortization period from 37.1 years to 50.9 years are as follows:

Previously Reported Period	37.1 years
Change due to:	
Normal amortization	(1.0)
Actuarial experience	(2.5)
Assumption/Method changes	17.1
Plan amendments	0.0
Contribution Shortfall/(Excess)	0.2
Computed Period	50.9 years

Section VII: Actuarially Determined Contribution Rate (ADC)

1. One of the metrics in the Funding Policy, as shown in Schedule F, is to calculate the Actuarially Determined Contribution (ADC) based on the principle elements of the Amortization Method disclosed in the Funding Policy. The ratio of the ADC to the fixed contribution rate (ADC/FCR) as set by this Funding Policy will be tested each valuation. The Funding Policy provides that the unfunded actuarial accrued liability as of June 30, 2018 (Transitional UAAL) will be amortized as a level percentage of payroll over a closed 30-year period. In each subsequent valuation, all benefit changes, assumption and method changes, and experience gains and/or losses that have occurred since the previous valuation will combine to determine a New Incremental UAAL. Each New Incremental UAAL will be amortized as a level percentage of payroll over a closed 25-year period from the date it is established.

2. The following table shows the components of the total Unfunded Actuarial Accrued Liability (UAAL) and the derivation of the UAAL Contribution Rate in accordance with the funding policy as of the valuation date:

TOTAL UAAL AND UAAL CONTRIBUTION RATE
($ in Thousands)

Date Established	Original UAAL Balance	Remaining UAAL Balance	Remaining Amortization Period	Amortization Payment
June 30, 2018	$16,940,459	$17,606,307	27 years	$1,161,725
June 30, 2019	784,879	795,026	23 years	57,101
June 30, 2020	524,319	528,113	24 years	37,053
June 30, 2021	506,599	506,599	25 years	34,775
Total		$19,436,045		$1,290,654
Estimated Payroll				$6,546,352
UAAL Amortization Contribution Rate				19.72%

Section VII: Actuarially Determined Contribution Rate (ADC)

3. The calculation of Actuarial Determined Contribution (ADC) for the past two valuations is shown below:

Funding Policy ADC Metric Test		
Valuation Date June 30	2021	2020
Actuarially Determined Contribution (ADC) rate		
Normal Cost*	1.77%	1.34%
Accrued liability	19.72	18.15
Total	21.49%	19.49%
Ratio of ADC to FCR	123.51%	112.01%
Funding Policy Metric Status	Red	Red
Anticipated accrued liability payment period	26.7 years	27.7 years

* Estimated budgeted administrative expenses are included in the normal cost rate

4. **Although the Ratio of ADC to FCR is above 110% and the Metric Status is in the "Red Status" for the 2021 valuation and per the Funding Policy the actuary should recommend an increase to the FCR, the anticipated smoothing in of the positive investment experience for the fiscal year ending June 30, 2021 will improve this ratio within the next four valuations. Therefore, there is no recommendation for an increase in the Fixed Contribution Rate of 17.40% of annual compensation at this time. More details can be found in the Projection section of this report beginning in Section IX. We will continue to monitor this metric to determine if the Board should consider an increase to the FCR in the future.**

Section VIII: 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, 2021

GROUP	NUMBER
Retired participants and beneficiaries currently receiving benefits	112,158
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	84,913
Active Participants	145,673
Total	342,744

2. Another such item is the schedule of funding progress as shown below. As can be seen in column 3 of the table below, the funded ratio has remained in a narrow range since 2014. However, the unfunded actuarial accrued liability as a percentage of payroll, shown in column 6, has steadily increased over the last 10 years. This is mainly due to the annual covered payroll not growing as anticipated over this period.

SCHEDULE OF FUNDING PROGRESS
($ Thousands)

Plan Year Ended	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability (AAL) Entry Age	(3) Funded Ratio (1)/(2)	(4) Unfunded AAL (2) – (1)	(5) Annual Covered Payroll	(6) Unfunded AAL as a Percentage of Covered Payroll (4)/(5)
06/30/12	$19,992,797	$34,492,873	58.0%	$14,500,076	$5,857,789	247.5%
06/30/13#	20,490,555	35,542,848	57.7	15,052,293	5,823,578	258.5
06/30/14	22,569,940	37,015,288	61.0	14,445,348	5,834,687	247.6
06/30/15#	24,387,161	40,364,584	60.4	15,977,423	5,904,827	270.6
06/30/16*#	25,185,078	41,997,513	60.0	16,812,435	6,022,533	279.2
06/30/17#	26,364,446	43,166,491	61.1	16,802,045	6,038,229	278.3
06/30/18	27,455,702	44,396,161	61.8	16,940,459	5,999,231	282.4
06/30/19#	28,024,611	46,006,859	60.9	17,982,248	6,144,916	292.6
06/30/20	28,629,205	47,354,464	60.5	18,725,259	6,287,441	297.8
06/30/21#	30,768,251	50,204,296	61.3	19,436,045	6,246,077	311.2

* After change in benefit provisions.
\# After change in actuarial assumptions.

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)
6/30/12	$4,463,252	$19,547,367	$10,482,254	$19,992,797	100.0%	79.4%	0.0%
6/30/13	5,053,888	20,789,551	9,699,409	20,490,555	100.0	74.3	0.0
6/30/14	5,277,944	22,033,588	9,703,756	22,569,940	100.0	78.5	0.0
6/30/15	5,379,226	24,012,624	10,972,734	24,387,161	100.0	79.2	0.0
6/30/16	5,468,859	25,390,774	11,137,880	25,185,078	100.0	77.7	0.0
6/30/17	5,534,403	26,686,958	10,945,130	26,364,446	100.0	78.1	0.0
6/30/18	5,570,524	27,874,365	10,951,272	27,455,702	100.0	78.5	0.0
6/30/19	5,626,602	29,109,623	11,270,634	28,024,611	100.0	76.9	0.0
6/30/20	5,710,182	30,220,083	11,424,199	28,629,205	100.0	75.8	0.0
6/30/21	5,728,172	31,821,655	12,654,469	30,768,251	100.0	78.7	0.0

As can be seen from the table above, the PERS plan assets currently covers 100% of the active member contribution account balances as of the valuation date but only covers about 79% of the retiree liability. This ratio had increased from 2016 through 2018, decreased from 2019 through 2020 and increased again in 2021. There remains zero assets to cover any employer-financed active liabilities.

Section VIII: Supplemental Disclosure Information

Schedule of Active Member Valuation Data

Valuation Date	Number of Employers	Active Members Number	Active Members Annual Payroll	Active Members Annual Average Pay	Active Members % Increase in Average Pay
2012	870	162,311	$5,857,789,376	$36,090	2.6%
2013	873	161,744	5,823,577,978	36,005	(0.2)
2014	871	161,360	5,834,686,655	36,159	0.4
2015	868	157,215	5,904,827,181	37,559	3.9
2016	862	154,104	6,022,532,933	39,081	4.1
2017	861	152,382	6,038,228,708	39,626	1.4
2018	858	150,687	5,999,230,701	39,813	0.5
2019	854	150,651	6,144,915,630	40,789	2.5
2020	853	149,855	6,287,441,467	41,957	2.9
2021	855	145,673	6,246,076,841	42,877	2.2

Schedule of Retirants Added to and Removed From Rolls*
Last Ten Fiscal Years

	Fiscal Year Ended June 30									
Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Beginning of Year	83,115	86,829	90,214	93,504	96,338	99,483	102,260	104,973	107,844	109,881
Added	6,569	6,276	6,159	5,907	6,548	6,219	5,985	6,101	5,645	6,502
Removed	(2,855)	(2,891)	(2,869)	(3,073)	(3,403)	(3,442)	(3,272)	(3,230)	(3,608)	(4,225)
End of Year	86,829	90,214	93,504	96,338	99,483	102,260	104,973	107,844	109,881	112,158

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

Section VIII: Supplemental Disclosure Information

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

Year Ending	2015	2016	2017	2018	2019	2020	2021
Beginning of Year	$1,998,322,954	$2,116,322,652	$2,249,044,704	$2,374,747,017	$2,500,750,392	$2,635,004,675	$2,755,593,924
Added	117,113,206	132,970,248	123,938,697	121,870,115	129,095,132	121,134,338	133,897,944
Removed	(55,158,128)	(59,603,335)	(62,470,173)	(64,186,324)	(67,416,138)	(76,727,172)	(93,663,207)
Benefit increase due to annual COLA	56,044,620	59,355,139	64,233,789	68,319,584	72,575,289	76,182,083	79,655,197
Benefit increase due to plan amendments	0	0	0	0	0	0	0
End of Year	$2,116,322,652	$2,249,044,704	$2,374,747,017	$2,500,750,392	$2,635,004,675	$2,755,593,924	$2,875,483,858

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, 2020 to June 30, 2021									
Average Monthly Benefit	$484.13	$797.70	$1,170.70	$1,723.73	$2,080.55	$2,202.62	$2,731.08	$3,198.31	$1,678.95
Average Final Salary	$34,676	$39,370	$43,511	$49,033	$52,995	$54,445	$62,496	$62,914	$48,259
Number of Active Retirants	775	1,026	971	1,186	365	1,098	200	881	6,502
July 1, 2019 to June 30, 2020									
Average Monthly Benefit	$495.24	$780.45	$1,218.15	$1,881.34	$1,994.68	$2,307.13	$2,634.63	$3,166.16	$1,762.99
Average Final Salary	$34,969	$38,904	$45,180	$52,942	$51,515	$56,787	$60,150	$61,884	$49,926
Number of Active Retirants	641	844	787	1,037	339	1,062	192	838	5,645
July 1, 2018 to June 30, 2019									
Average Monthly Benefit	$476.23	$730.46	$1,156.10	$1,852.18	$2,090.55	$2,315.68	$2,469.25	$3,355.92	$1,734.50
Average Final Salary	$33,243	$36,871	$42,708	$51,686	$52,874	$55,298	$55,458	$65,639	$48,544
Number of Active Retirants	730	930	870	1,127	359	1,062	204	819	6,101
July 1, 2017 to June 30, 2018									
Average Monthly Benefit	$485.22	$722.11	$1,057.13	$1,767.43	$2,023.90	$2,173.95	$2,533.72	$3,178.78	$1,676.34
Average Final Salary	$32,660	$37,608	$39,878	$49,009	$52,289	$52,205	$57,261	$60,427	$46,987
Number of Active Retirants	672	933	849	1,047	348	1,080	192	864	5,985
July 1, 2016 to June 30, 2017									
Average Monthly Benefit	$475.88	$727.37	$1,013.30	$1,655.71	$1,947.82	$2,105.82	$2,446.29	$3,092.75	$1,632.44
Average Final Salary	$31,990	$37,033	$39,332	$47,400	$49,568	$50,461	$55,156	$59,849	$45,739
Number of Active Retirants	732	938	859	1,014	369	1,174	190	943	6,219

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, 2015 to June 30, 2016									
Average Monthly Benefit	$512.05	$701.11	$1,053.82	$1,638.19	$1,878.66	$2,117.88	$2,400.11	$3,196.32	$1,665.54
Average Final Salary	$31,771	$34,459	$39,422	$45,571	$46,533	$50,536	$52,472	$59,306	$44,872
Number of Active Retirants	751	997	874	1,048	402	1,204	234	1,038	6,548
July 1, 2014 to June 30, 2015									
Average Monthly Benefit	$458.27	$688.17	$977.30	$1,346.27	$1,833.91	$1,989.13	$2,217.36	$2,898.93	$1,600.68
Average Final Salary	$29,781	$33,585	$37,938	$40,770	$46,461	$48,614	$50,908	$57,019	$43,642
Number of Active Retirants	599	898	774	693	494	1,072	230	1,147	5,907
July 1, 2013 to June 30, 2014									
Average Monthly Benefit	$465.38	$712.04	$998.80	$1,383.89	$1,871.16	$1,992.51	$2,283.20	$2,954.14	$1,585.88
Average Final Salary	$31,044	$35,356	$37,962	$40,947	$47,490	$48,732	$51,456	$57,022	$43,744
Number of Active Retirants	751	945	815	663	505	1,146	232	1,102	6,159
July 1, 2012 to June 30, 2013									
Average Monthly Benefit	$442.04	$694.71	$963.61	$1,421.74	$1,924.91	$2,016.94	$2,187.80	$2,931.36	$1,563.58
Average Final Salary	$30,487	$34,404	$36,876	$41,550	$47,768	$48,862	$49,470	$56,341	$43,082
Number of Active Retirants	915	901	740	758	496	1,121	224	1,121	6,276
July 1, 2011 to June 30, 2012									
Average Monthly Benefit	$436.84	$655.76	$984.40	$1,325.25	$1,823.47	$1,956.67	$2,283.30	$2,938.26	$1,560.13
Average Final Salary	$29,120	$32,872	$37,561	$40,246	$46,050	$47,965	$51,720	$56,263	$42,606
Number of Active Retirants	1,007	867	779	736	501	1,138	260	1,281	6,569

Section IX: Projection Results

Annual actuarial valuations are performed for PERS 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. PERS 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 IX: Projection Results

SPECIAL ASSUMPTIONS

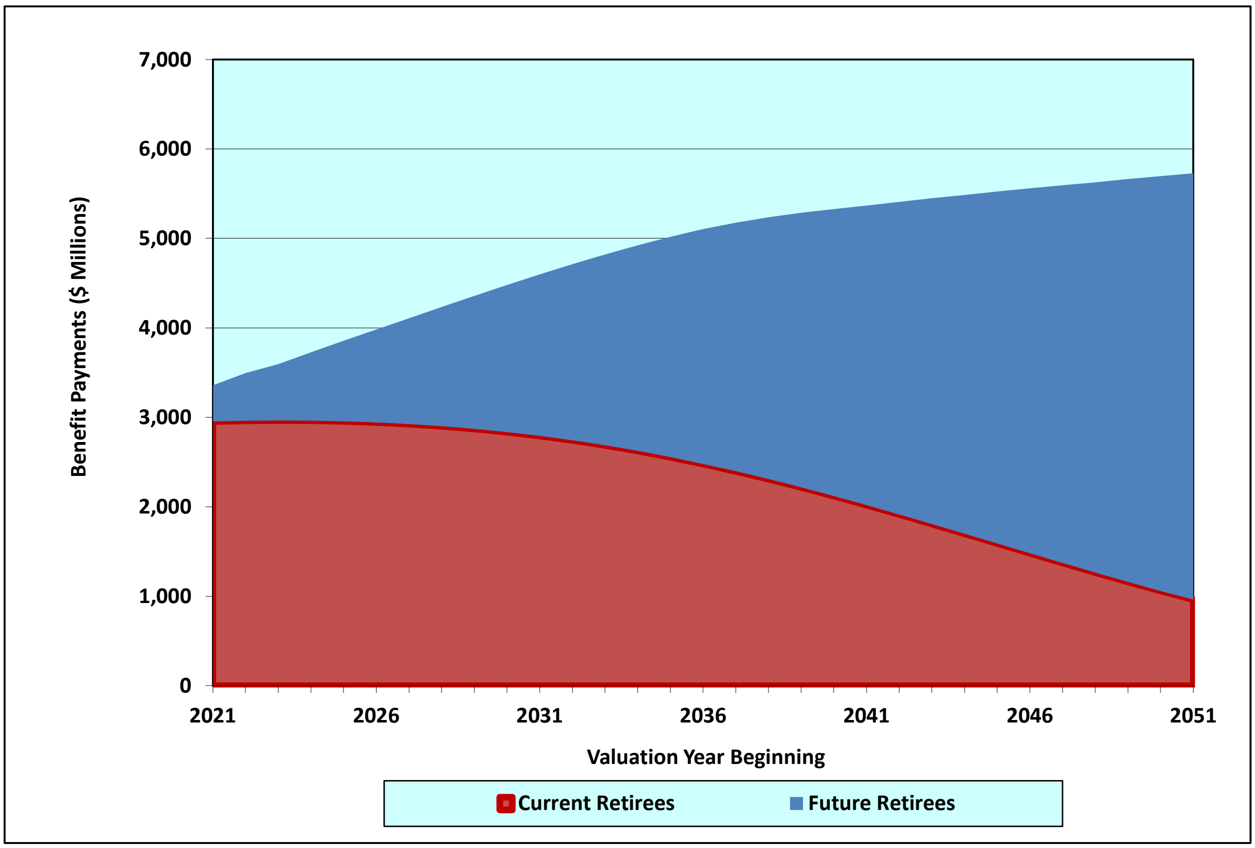
In addition to the regular valuation assumptions used in performing the annual actuarial valuations of PERS, additional assumptions must be made that are unique to projections. The first of these is what, if any, change in the overall active membership will be anticipated. For this projection, it was 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 over the 3-year period prior to the projection start date of June 30, 2021. That profile is summarized in the table below.

Age	Average Pay	Percent Male	Weight
19	$28,500	65%	1.0%
23	30,800	40	19.8
27	34,200	36	20.7
32	34,200	34	12.9
37	34,500	33	10.8
42	34,000	33	8.9
47	34,000	37	7.7
52	34,000	37	6.8
57	34,000	42	5.6
62	34,000	47	3.4
69	30,000	50	2.4

Section IX: 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, 2021 would remain in place for the following 30 years. The following graph shows the projection of benefit payments of PERS members. The red area of the graph are the benefit payments for current retirees and the blue area are the benefit payments for any future retirees. PERS currently pays approximately $3.0 Billion in benefit payments to its retirees but over the 30-year period, that amount is expected to nearly double.



Section IX: 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, 2021 and those who are hired after June 30, 2021. Even though the membership at PERS has been trending downward over the past few years, we believe that the active membership will continue at or around its current population of 145,673 active members over the projected period. After a reduction in active membership since 2008, many statewide public sector systems are beginning to experience a turnaround and active membership is starting to level off and even increase.

By the end of the projection period, we estimate that about 97.9% of those active employees will have been hired after June 30, 2021 and be included in the Tier 4 benefit structure.

Member	2021	2026	2031	2041	2047	2051
Active – Existing Employees	145,673	83,368	50,100	16,406	7,277	3,081
Active – New Entrants	0	62,305	95,573	129,267	138,396	142,592
Retired/Deferred Vesteds	129,045	141,732	149,435	149,149	143,726	140,359
Total	274,718	287,405	295,108	294,822	289,399	286,032

Section IX: Projection Results

Projection Results

The baseline valuation and projection results shown below use the same actuarial assumptions as used in the June 30, 2021 actuarial valuation. 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%)
($ in Thousands)

	2021	2026	2031	2041	2047	2051
Total Payroll	$6,246,077	$7,002,983	$7,789,969	$9,887,092	$11,550,805	$12,828,866
UAL	$19,436,045	$15,274,287	$15,006,268	$11,039,698	$4,355,409	$0
Normal Cost Rate	1.77%	1.68%	1.67%	1.71%	1.75%	1.79%
UAL Rate	15.63%	15.72%	15.73%	15.69%	15.65%	15.61%
FCR Rate	17.40%	17.40%	17.40%	17.40%	17.40%	17.40%
Funding Ratio	61.3%	72.4%	74.6%	82.7%	93.5%	100.0%
Amortization Period	51 years	22 years	18 years	9 years	3 years	0 years
ADC	21.49%	17.66%	18.25%	19.78%	19.77%	3.08%
ADC/FCR Ratio	123.5%	101.5%	104.9%	113.6%	113.6%	17.7%
Cash Flow Percentage	-4.5%	-5.2%	-5.5%	-5.0%	-3.8%	-3.0%

Projection Results Assuming 7.25% Long-Term Investment Return
($ in Thousands)

	2021	2026	2031	2041	2047	2051
Total Payroll	$6,246,077	$7,002,983	$7,789,969	$9,887,092	$11,550,805	$12,828,866
UAL	$19,436,045	$17,559,061	$18,424,700	$18,379,315	$15,814,784	$12,305,393
Normal Cost Rate	1.77%	2.32%	2.29%	2.33%	2.39%	2.43%
UAL Rate	15.63%	15.08%	15.11%	15.07%	15.01%	14.97%
FCR Rate	17.40%	17.40%	17.40%	17.40%	17.40%	17.40%
Funding Ratio	61.3%	69.3%	69.9%	72.2%	77.2%	83.0%
Amortization Period	51 years	30 years	26 years	17 years	12 years	7 years
ADC	21.49%	20.69%	21.98%	27.23%	28.82%	13.30%
ADC/FCR Ratio	123.5%	118.9%	126.3%	156.5%	165.6%	76.4%
Cash Flow Percentage	-4.5%	-5.2%	-5.8%	-5.5%	-4.5%	-3.6%

Section IX: Projection Results

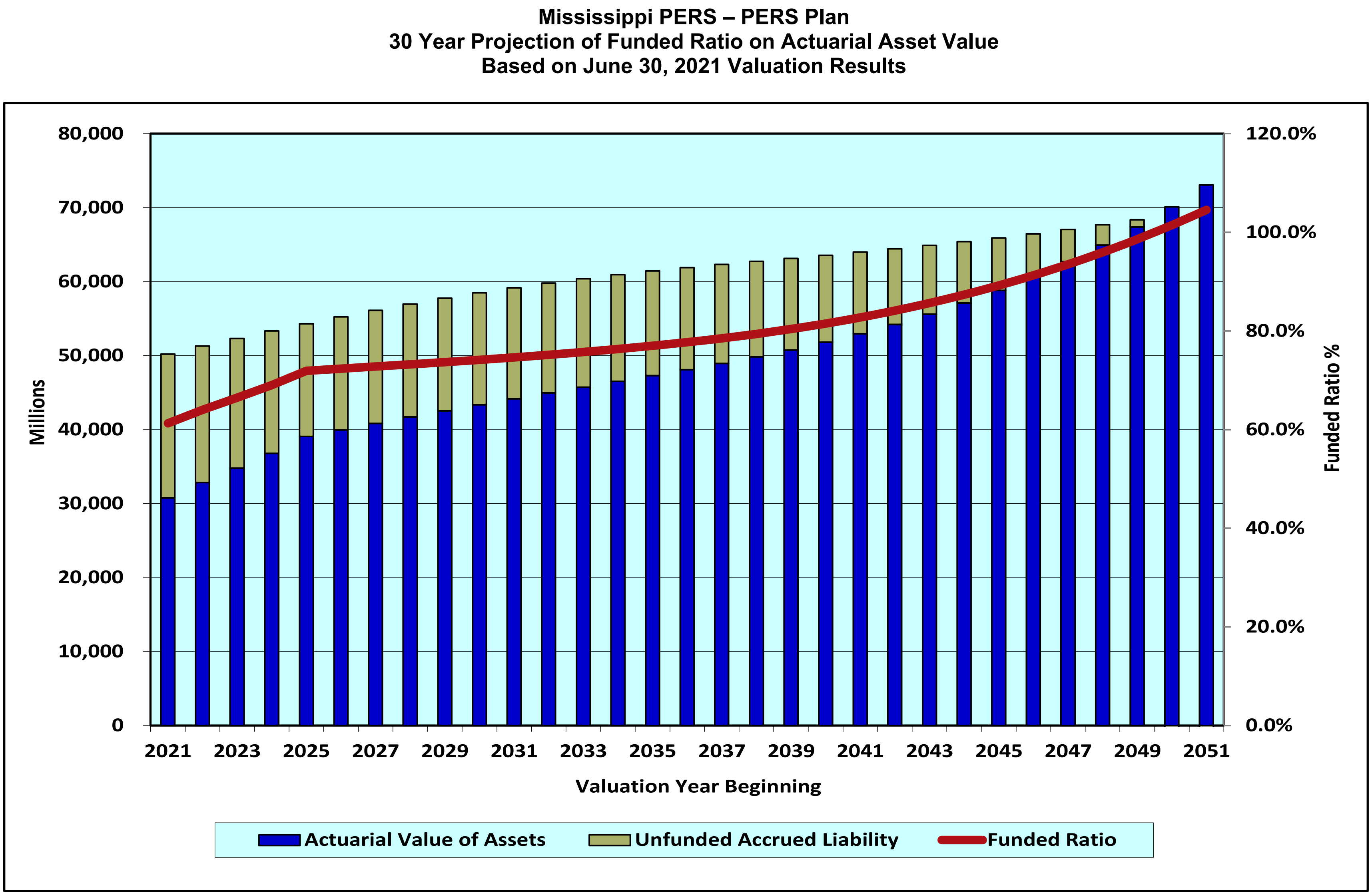
Projection Results Assuming 7.00% Long-Term Investment Return
($ in Thousands)

	2021	2026	2031	2041	2047	2051
Total Payroll	$6,246,077	$7,002,983	$7,789,969	$9,887,092	$11,550,805	$12,828,866
UAL	$19,436,045	$19,473,833	$21,259,243	$24,266,023	$24,796,898	$24,244,456
Normal Cost Rate	1.77%	2.85%	2.81%	2.85%	2.91%	2.96%
UAL Rate	15.63%	14.55%	14.59%	14.55%	14.49%	14.44%
FCR Rate	17.40%	17.40%	17.40%	17.40%	17.40%	17.40%
Funding Ratio	61.3%	66.8%	66.1%	64.3%	65.2%	67.4%
Amortization Period	51 years	38 years	36 years	28 years	23 years	19 years
ADC	21.49%	23.22%	24.97%	33.04%	35.65%	21.00%
ADC/FCR Ratio	123.5%	133.5%	143.5%	189.9%	204.9%	120.7%
Cash Flow Percentage	-4.5%	-5.3%	-6.0%	-6.0%	-5.2%	-4.3%

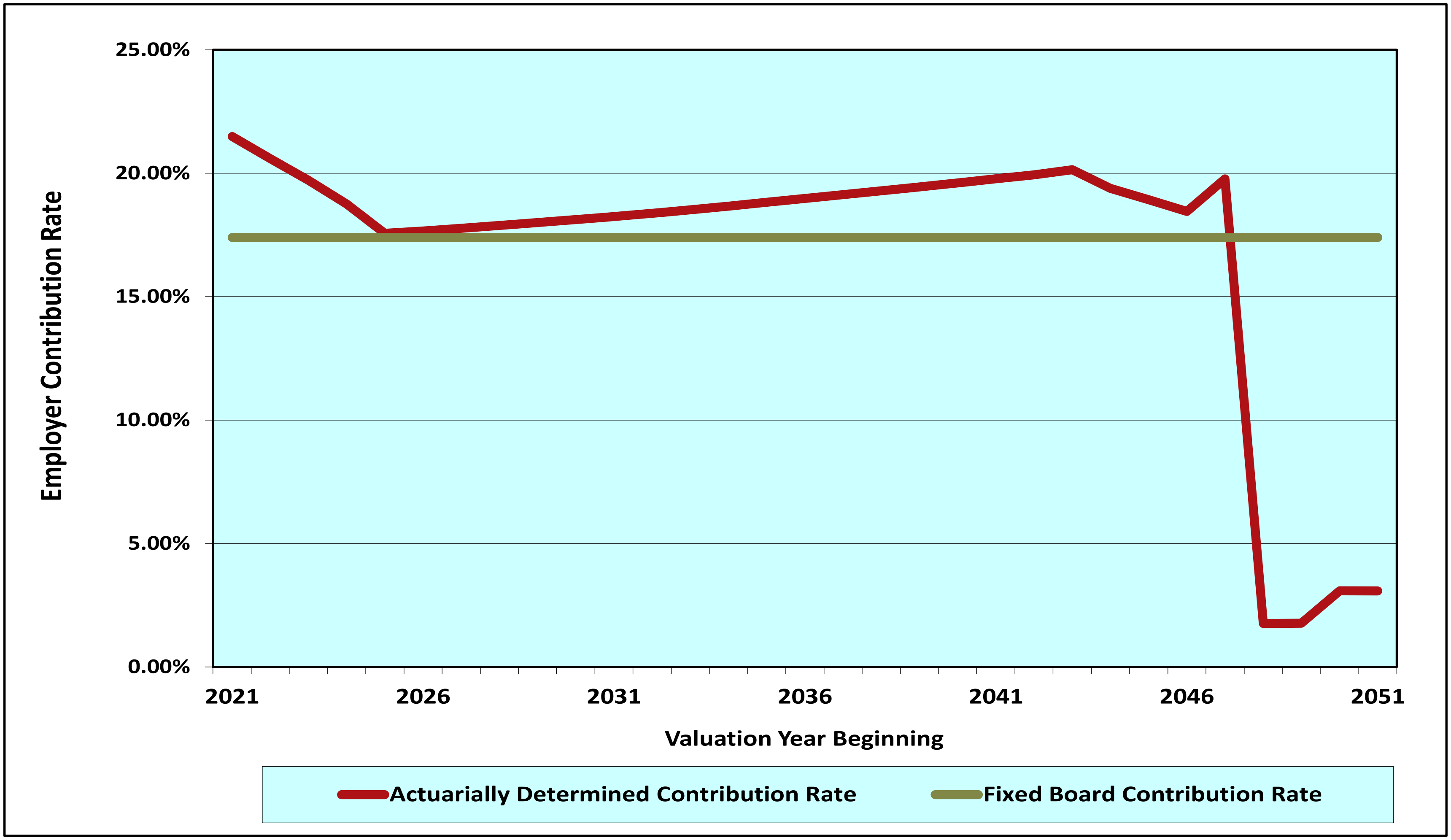
The first graph that follows shows the projection of the Unfunded Accrued Liability (UAL), Actuarial Value of Assets and the Funded Ratio under the baseline valuation (assuming 7.55%) from the amounts shown in the table on page 31. As you can see from the graph, under the current assumptions, the funded ratio is expected to increase to nearly 75% within the next ten years and then remain on a slight upward trend over the remaining projection period until PERS is expected to reach 100% funded in or around the 2050 valuation year.

The second graph shows the projection of the calculated Actuarially Determined Contribution (ADC) based on the Board's Funding Policy and the current Fixed Contribution Rate (FCR) of 17.40% under the baseline valuation. As you can see from the graph, the ADC is expected to decrease over the next five years as the investment gains from the fiscal year ending June 30, 2021 are fully recognized. After this initial period, the ADC is then expected to increase but expected to remain at modest levels between 17% and 20% for most of the projection period. The drop in the ADC near the end of the projection period is a result of the initial 2018 UAL base of $17 Billion being paid off, based on the closed amortization period per the Board's Funding Policy.

Section IX: Projection Results



Mississippi PERS – PERS Plan
30 Year Projection of the Employer Contribution Rates
Based on June 30, 2021 Valuation Results



Section X: 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 PERS, have negative cash flow, where benefit payments paid out of the trust are more than the contributions being collected by employers and employees.

For the fiscal year ending June 30, 2022, we are projecting PERS to have a negative cash flow of approximately $1.60 Billion (benefit payments of $3.36 Billion and contributions of $1.76 Billion). With a market value of assets of $35.2 Billion as of June 30, 2021, the cash flow as a percentage of assets is estimated to be negative 4.53% for the 2022 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 2022 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 two pages demonstrate the open group projection of cash flow on the baseline assumption and then a sensitivity analysis, using a one-year investment return of negative 7.00% for the fiscal year ending June 30, 2022. This demonstrates the projection of this metric if PERS 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 37, the cash flow as a percentage of market value of assets does not get more than negative 5.65% on the baseline assumption, meaning that PERS' assets should continue to increase as long as all baseline actuarial assumptions are met. However, if there is a significant negative investment experience in one of the next five years (as seen on the table on page 38), the negative cash flow could be significantly more than the investment experience of the Plan and PERS' assets may decrease at some point during the projection period.

This metric will continue to be monitored as part of the funding policy under the baseline assumptions to ensure the continued growth of PERS' assets during the projection period.

Section X: Cash Flow Projections

Mississippi PERS
30-year Open Group Projection of Cash Flow
PERS Plan
Based on June 30, 2021 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
2021	7.55%	6,546,352,060	35,216,597,000	1,762,801,683	(3,359,217,941)	-4.53%	2,599,684,841	1,003,268,583	36,219,865,583	2022
2022	7.55%	6,623,241,507	36,219,865,583	1,783,506,473	(3,496,958,156)	-4.73%	2,671,093,916	957,642,233	37,177,507,816	2023
2023	7.55%	6,738,532,363	37,177,507,816	1,814,551,995	(3,597,778,724)	-4.80%	2,740,809,821	957,583,092	38,135,090,908	2024
2024	7.55%	6,866,744,784	38,135,090,908	1,849,077,035	(3,727,736,796)	-4.93%	2,809,570,294	930,910,533	39,066,001,441	2025
2025	7.55%	7,002,983,257	39,066,001,441	1,885,763,331	(3,858,726,277)	-5.05%	2,876,358,865	903,395,920	39,969,397,361	2026
2026	7.55%	7,146,637,892	39,969,397,361	1,924,446,652	(3,984,363,118)	-5.15%	2,941,342,485	881,426,018	40,850,823,379	2027
2027	7.55%	7,297,992,380	40,850,823,379	1,965,203,388	(4,111,199,327)	-5.25%	3,004,699,772	858,703,833	41,709,527,212	2028
2028	7.55%	7,455,106,143	41,709,527,212	2,007,510,982	(4,235,474,567)	-5.34%	3,066,493,931	838,530,346	42,548,057,558	2029
2029	7.55%	7,618,783,465	42,548,057,558	2,051,586,011	(4,363,088,342)	-5.43%	3,126,706,763	815,204,433	43,363,261,991	2030
2030	7.55%	7,789,969,069	43,363,261,991	2,097,682,871	(4,481,315,828)	-5.50%	3,185,581,308	801,948,351	44,165,210,342	2031
2031	7.55%	7,966,193,581	44,165,210,342	2,145,136,607	(4,597,868,446)	-5.55%	3,243,567,386	790,835,548	44,956,045,889	2032
2032	7.55%	8,147,802,749	44,956,045,889	2,194,040,324	(4,712,930,287)	-5.60%	3,300,823,440	781,933,477	45,737,979,367	2033
2033	7.55%	8,334,673,725	45,737,979,367	2,244,360,941	(4,823,942,803)	-5.64%	3,357,609,984	778,028,121	46,516,007,488	2034
2034	7.55%	8,527,701,336	46,516,007,488	2,296,339,416	(4,926,785,479)	-5.65%	3,414,465,919	784,019,856	47,300,027,344	2035
2035	7.55%	8,729,583,082	47,300,027,344	2,350,702,132	(5,022,341,678)	-5.65%	3,472,132,658	800,493,113	48,100,520,457	2036
2036	7.55%	8,939,216,358	48,100,520,457	2,407,152,181	(5,106,263,642)	-5.61%	3,531,551,692	832,440,231	48,932,960,688	2037
2037	7.55%	9,160,028,617	48,932,960,688	2,466,612,506	(5,178,739,368)	-5.54%	3,593,918,537	881,791,675	49,814,752,363	2038
2038	7.55%	9,392,059,470	49,814,752,363	2,529,093,774	(5,238,783,901)	-5.44%	3,660,584,122	950,893,995	50,765,646,358	2039
2039	7.55%	9,634,707,205	50,765,646,358	2,594,433,956	(5,288,602,941)	-5.31%	3,732,951,881	1,038,782,896	51,804,429,254	2040
2040	7.55%	9,887,092,368	51,804,429,254	2,662,396,233	(5,330,600,077)	-5.15%	3,812,342,340	1,144,138,496	52,948,567,750	2041
2041	7.55%	10,147,668,629	52,948,567,750	2,732,564,208	(5,369,677,744)	-4.98%	3,899,877,101	1,262,763,565	54,211,331,315	2042
2042	7.55%	10,414,671,719	54,211,331,315	2,804,462,800	(5,411,719,917)	-4.81%	3,996,322,324	1,389,065,208	55,600,396,523	2043
2043	7.55%	10,687,364,330	55,600,396,523	2,877,893,467	(5,451,136,547)	-4.63%	4,102,457,415	1,529,214,335	57,129,610,858	2044
2044	7.55%	10,967,171,358	57,129,610,858	2,953,239,903	(5,489,602,670)	-4.44%	4,219,279,998	1,682,917,231	58,812,528,089	2045
2045	7.55%	11,255,084,749	58,812,528,089	3,030,769,221	(5,527,914,538)	-4.25%	4,347,793,772	1,850,648,455	60,663,176,544	2046
2046	7.55%	11,550,804,529	60,663,176,544	3,110,400,644	(5,563,194,380)	-4.04%	4,489,161,540	2,036,367,803	62,699,544,347	2047
2047	7.55%	11,855,827,168	62,699,544,347	3,192,537,140	(5,597,901,614)	-3.84%	4,644,665,187	2,239,300,713	64,938,845,060	2048
2048	7.55%	12,170,408,524	64,938,845,060	3,277,247,607	(5,631,635,970)	-3.63%	4,815,621,727	2,461,233,364	67,400,078,424	2049
2049	7.55%	12,494,670,376	67,400,078,424	3,364,564,839	(5,665,244,701)	-3.41%	5,003,435,453	2,702,755,591	70,102,834,015	2050
2050	7.55%	12,828,865,987	70,102,834,015	3,454,557,033	(5,700,438,866)	-3.20%	5,209,524,488	2,963,642,655	73,066,476,670	2051
2051	7.55%	13,171,882,512	73,066,476,670	3,546,924,523	(5,730,668,190)	-2.99%	5,435,582,545	3,251,838,878	76,318,315,548	2052

Section X: Cash Flow Projections

Mississippi PERS
30-year Open Group Projection of Cash Flow
PERS Plan
Based on June 30, 2021 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
2021	-7.00%	6,546,352,060	35,216,597,000	1,762,801,683	(3,359,217,941)	-4.53%	(2,408,273,618)	(4,004,689,876)	31,211,907,124	2022
2022	7.55%	6,623,241,507	31,211,907,124	1,783,506,473	(3,496,958,156)	-5.49%	2,292,993,052	579,541,369	31,791,448,493	2023
2023	7.55%	6,738,532,363	31,791,448,493	1,814,551,995	(3,597,778,724)	-5.61%	2,334,162,342	550,935,613	32,342,384,106	2024
2024	7.55%	6,866,744,784	32,342,384,106	1,849,077,035	(3,727,736,796)	-5.81%	2,372,220,931	493,561,170	32,835,945,276	2025
2025	7.55%	7,002,983,257	32,835,945,276	1,885,763,331	(3,858,726,277)	-6.01%	2,405,989,625	433,026,680	33,268,971,956	2026
2026	7.55%	7,146,637,892	33,268,971,956	1,924,446,652	(3,984,363,118)	-6.19%	2,435,460,367	375,543,900	33,644,515,856	2027
2027	7.55%	7,297,992,380	33,644,515,856	1,965,203,388	(4,111,199,327)	-6.38%	2,460,623,554	314,627,615	33,959,143,471	2028
2028	7.55%	7,455,106,143	33,959,143,471	2,007,510,982	(4,235,474,567)	-6.56%	2,481,339,959	253,376,374	34,212,519,845	2029
2029	7.55%	7,618,783,465	34,212,519,845	2,051,586,011	(4,363,088,342)	-6.76%	2,497,373,665	185,871,335	34,398,391,180	2030
2030	7.55%	7,789,969,069	34,398,391,180	2,097,682,871	(4,481,315,828)	-6.93%	2,508,733,562	125,100,605	34,523,491,785	2031
2031	7.55%	7,966,193,581	34,523,491,785	2,145,136,607	(4,597,868,446)	-7.10%	2,515,617,635	62,885,797	34,586,377,581	2032
2032	7.55%	8,147,802,749	34,586,377,581	2,194,040,324	(4,712,930,287)	-7.28%	2,517,913,483	(976,480)	34,585,401,102	2033
2033	7.55%	8,334,673,725	34,585,401,102	2,244,360,941	(4,823,942,803)	-7.46%	2,515,590,325	(63,991,538)	34,521,409,564	2034
2034	7.55%	8,527,701,336	34,521,409,564	2,296,339,416	(4,926,785,479)	**-7.62%**	2,508,873,776	(121,572,287)	34,399,837,277	2035
2035	7.55%	8,729,583,082	34,399,837,277	2,350,702,132	(5,022,341,678)	**-7.77%**	2,498,168,308	(173,471,237)	34,226,366,040	2036
2036	7.55%	8,939,216,358	34,226,366,040	2,407,152,181	(5,106,263,642)	**-7.89%**	2,484,053,033	(215,058,428)	34,011,307,612	2037
2037	7.55%	9,160,028,617	34,011,307,612	2,466,612,506	(5,178,739,368)	**-7.97%**	2,467,333,730	(244,793,132)	33,766,514,480	2038
2038	7.55%	9,392,059,470	33,766,514,480	2,529,093,774	(5,238,783,901)	**-8.02%**	2,448,942,162	(260,747,965)	33,505,766,515	2039
2039	7.55%	9,634,707,205	33,505,766,515	2,594,433,956	(5,288,602,941)	**-8.04%**	2,429,830,953	(264,338,032)	33,241,428,483	2040
2040	7.55%	9,887,092,368	33,241,428,483	2,662,396,233	(5,330,600,077)	**-8.03%**	2,410,835,782	(257,368,062)	32,984,060,421	2041
2041	7.55%	10,147,668,629	32,984,060,421	2,732,564,208	(5,369,677,744)	**-8.00%**	2,392,556,798	(244,556,738)	32,739,503,683	2042
2042	7.55%	10,414,671,719	32,739,503,683	2,804,462,800	(5,411,719,917)	**-7.96%**	2,375,199,338	(232,057,778)	32,507,445,905	2043
2043	7.55%	10,687,364,330	32,507,445,905	2,877,893,467	(5,451,136,547)	**-7.92%**	2,358,939,643	(214,303,437)	32,293,142,468	2044
2044	7.55%	10,967,171,358	32,293,142,468	2,953,239,903	(5,489,602,670)	**-7.85%**	2,344,126,635	(192,236,132)	32,100,906,336	2045
2045	7.55%	11,255,084,749	32,100,906,336	3,030,769,221	(5,527,914,538)	**-7.78%**	2,331,066,329	(166,078,988)	31,934,827,348	2046
2046	7.55%	11,550,804,529	31,934,827,348	3,110,400,644	(5,563,194,380)	**-7.68%**	2,320,171,175	(132,622,562)	31,802,204,786	2047
2047	7.55%	11,855,827,168	31,802,204,786	3,192,537,140	(5,597,901,614)	**-7.56%**	2,311,916,050	(93,448,424)	31,708,756,362	2048
2048	7.55%	12,170,408,524	31,708,756,362	3,277,247,607	(5,631,635,970)	-7.43%	2,306,750,030	(47,638,333)	31,661,118,029	2049
2049	7.55%	12,494,670,376	31,661,118,029	3,364,564,839	(5,665,244,701)	-7.27%	2,305,143,943	4,464,081	31,665,582,110	2050
2050	7.55%	12,828,865,987	31,665,582,110	3,454,557,033	(5,700,438,866)	-7.09%	2,307,511,969	61,630,136	31,727,212,246	2051
2051	7.55%	13,171,882,512	31,727,212,246	3,546,924,523	(5,730,668,190)	-6.88%	2,314,468,081	130,724,414	31,857,936,660	2052

Section XI: 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 XI: 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% (7.25% and 7.00%). 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 returns (and then 7.55% for all years thereafter).

Projected Funded Ratio in 2047

Single Year Event	
• 1.55% in 2022	74.5%
• 3.55% in 2022	80.8%
• 5.55% in 2022	87.2%
• **7.55% in 2022 (Baseline)**	**93.5%**
• 9.55% in 2022	99.8%
• 11.55% in 2022	106.2%
• 13.55% in 2022	112.5%
• Negative 5% in 2022	53.8%
• Simulate 2008 loss using -15% in 2022	22.1%
Average Returns over next 10-Year Period (Simulated returns using mean and standard deviations from PERS' Investment Consultant's Capital Market Assumptions)*	
• 6.00%	55.9%
• 7.00%	80.1%
• 8.00%	112.7%

* *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 XI: Sensitivity Analysis

As can be seen from the projected funded ratios on the table above, the sensitivity of short-term investment returns could have a significant impact to the funding of PERS 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 XI: 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 PERS, there has been a significant decline in active membership since 2008. In the baseline projections we assume a static population, meaning the active membership will be the same in each of the projections than it is in 2021. 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. For PERS, a 0.50% decrease in active population each year of the projection results in the active population dropping to 120,000 (it is currently near 145,000). In the table below, we review these alternatives to the static active membership growth:

Projected Funded Ratio in 2047

Active Membership Growth	
• Increase 0.50% each year	100.7%
• Increase 0.25% each year	97.1%
• **Static Population (Baseline Assumption)**	**93.5%**
• Decrease 0.25% each year	90.0%
• Decrease 0.50% each year	86.5%

Section XI: 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 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 Ratio in 2047

Scenario	Price Inflation	Discount Rate	Wage Inflation	
1 - Baseline	2.40%	7.55%	2.65%	**93.5%**
2	2.40%	7.30%	2.65%	79.8%
3	2.10%	7.30%	2.35%	79.4%

Section XI: Sensitivity Analysis

Contribution Risk

To demonstrate the contribution risk of making the Fixed Contribution Rates (FCR) for PERS, we have calculated the projected funded ratios if the FCRs were 1% higher or 1% lower than the current rates for all future years beginning on July 1, 2023.

Projected Funded Ratio in 2047

Change in Fixed Contribution Rate (FCR)	
• Baseline	**93.5%**
• 1.00% increase in FCR	101.0%
• 1.00% decrease in FCR	86.0%

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 XII: Projection Summary

Utilizing the funding policy for PERS and with a fixed contribution rate as a percentage of annual compensation of 17.40% of payroll, the projection results for 2021 show that the Plan will have a “Green” light status for the funded ratio and cash flow metrics and have a “Yellow” status for the Actuarially Determined Contribution (ADC) metric within the next few years.

Metric	2021 Baseline Projection (7.55%)	2021 Status	2020 Baseline Projection (7.75%)	2020 Status
Funding Ratio in 2047	93.5%	Green	67.6%	Yellow
Cash Flow as a Percentage of Assets	-5.65%	Green	-6.20%	Yellow
ADC/FCR Ratio from 2021 Valuation	123.5%	Red	112.0%	Red
ADC/FCR Ratio from 2025 Valuation	100.9%	Yellow	122.0%	Red

Although the ADC/FCR ratio is in “Red Status” for the 2021 valuation and per the Funding Policy, the actuary should recommend an increase in the Fixed Contribution Rate, the ADC/FCR ratio is projected to decrease as the investment gains from the 2021 valuation are fully recognized. This is seen as the ADC/FCR ratio is projected to be approximately 101% in the 2025 valuation and in the “Yellow Status”. Therefore, there is no recommendation for an increase in the Fixed Contribution Rate of 17.40% of annual compensation at this time. However, the Board should continue to monitor these projection results during the fiscal year as actual investment and cash flow experience is known.

Schedule A: Development of Assets

($ thousands)

	Valuation Date June 30:	2020	2021	2022	2023	2024	2025
A.	Actuarial Value Beginning of Year	$28,024,611	$28,629,205				
B.	Market Value End of Year	27,827,394	35,216,597				
C.	Market Value Beginning of Year	28,206,602	27,827,394				
D.	Cash Flow						
	D1. Contributions	1,766,516	1,764,555				
	D2. Other Revenue	0	0				
	D3. Benefit Payments	(2,878,073)	(2,995,255)				
	D4. Refunds	(104,851)	(101,044)				
	D5. Administrative Expenses	(19,757)	(15,691)				
	D6. Net	(1,236,165)	(1,347,435)				
E.	Investment Income						
	E1. Market Total: B.-C.-D6.	856,957	8,736,638				
	E2. Assumed Rate	7.75%	7.75%				
	E3. Amount for Immediate Recognition	2,138,110	2,104,410				
	E4. Amount for Phased-In Recognition	(1,281,153)	6,632,228				
F.	Phased-In Recognition of Investment Income						
	F1. Current Year: 0.20*E4.	(256,231)	1,326,446				
	F2. First Prior Year	(81,275)	(256,231)	1,326,446			
	F3. Second Prior Year	73,801	(81,275)	(256,231)	1,326,446		
	F4. Third Prior Year	319,330	73,801	(81,275)	(256,231)	1,326,446	
	F5. Fourth Prior Year	(352,976)	319,330	73,801	(81,275)	(256,231)	1,326,450
	F6. Total Recognized Investment Gain	(297,351)	1,382,071	1,062,741	988,940	1,070,215	1,326,450
G.	Actuarial Value End of Year:						
	A.+D6.+E3.+F6.	$28,629,205	$30,768,251				
H.	Difference Between Market & Actuarial Values	$801,811	$(4,448,346)	$(3,385,605)	$(2,396,665)	$(1,326,450)	$0

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 Assets

Asset Summary June 30, 2021 ($ in Thousands)		
	Market Value	**Actuarial Value**
(1) Assets at June 30, 2020	$27,827,394	$28,629,205
(2) Contributions and Misc. Revenue	1,764,555	1,764,555
(3) Investment Increment	8,736,638	3,486,481
(4) Benefit Payments	(2,995,255)	(2,995,255)
(5) Refunds	(101,044)	(101,044)
(6) Administrative Expenses	(15,691)	(15,691)
(7) Assets at June 30, 2021 (1) + (2) + (3) + (4) + (5) + (6)	$35,216,597	$30,768,251
(8) Net Investment Return [2 x (3)] / [(7) + (1) – (3)]	32.17%	12.47%

Per the Board's funding policy, since the actual market value of asset return for the fiscal year ending June 30, 2021 was more than the current assumption, the long-term investment return assumption was reduced to 7.55 percent for the 2021 valuation. Please see the Funding Policy in Schedule E for an explanation of this process.

Schedule A: Development of Assets

The net investment returns for the past five valuations are summarized in the table below:

Period Ending June 30	Market Value	Actuarial Value
2017	14.9%	9.3%
2018	9.6%	9.2%
2019	6.3%	6.8%
2020	3.1%	6.7%
2021	32.2%	12.5%

Since 1986, PERS' assets have experienced better than assumed investment returns overall. As you can see from the table below, for the period ending June 30, 2021, the annualized returns for each rolling period is above the current assumption of 7.55%. The historical rolling returns are as follows (these returns are gross returns):

Period Ending June 30	10-Year Annualized Rate of Return	20-Year Annualized Rate of Return	25-Year Annualized Rate of Return	30-Year Annualized Rate of Return
2018	7.4%	6.2%	7.8%	8.5%
2019	10.5	6.0	8.1	8.3
2020	9.4	5.8	7.5	8.0
2021	10.1	7.7	8.1	8.7

Schedule B: Statement of Actuarial Assumptions & Methods

INTEREST RATE: 7.55% per annum, compounded annually (net of investment expense 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 rates of separation from active service are as follows:

	Annual Rates of			
	Death*		Disability	
Age	Male	Female	Male	Female
20	0.0483%	0.0126%	0.006%	0.006%
25	0.0567	0.0189	0.011	0.011
30	0.0630	0.0259	0.016	0.016
35	0.0714	0.0350	0.020	0.020
40	0.0893	0.0483	0.090	0.050
45	0.1218	0.0665	0.170	0.100
50	0.1764	0.0917	0.260	0.170
55	0.2594	0.1274	0.370	0.290
60	0.3980	0.1757	0.310	0.250
65	0.6353	0.2429	0.280	0.220
70	1.1655	0.4739	0.200	0.150
75	2.1389	0.9247	0.200	0.150
79	3.4755	1.5785	0.200	0.150

* Adjusted Base Rates

AGE	Annual Rates of Withdrawal* Years of Service											
	0		5		10		15		20		24	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
20	40.00%	45.00%	13.00%	14.00%								
25	34.50	37.00	13.00	12.50	9.00%	9.00%						
30	34.00	35.00	12.00	12.50	6.50	6.50	5.00%	5.00%				
35	33.75	30.00	12.00	12.00	6.50	6.25	4.00	4.25	4.00%	3.50%		
40	33.50	28.00	9.50	9.50	6.00	6.00	4.00	4.25	4.00	3.50	4.00%	3.50%
45	32.00	27.50	9.50	9.50	5.50	5.75	4.00	4.25	4.00	3.50	4.00	3.50
50	28.00	27.50	9.50	9.50	5.50	5.75	4.00	4.25	4.00	3.50	4.00	3.50
55	25.00	25.00	9.50	9.50	5.50	5.75	4.00	4.25	4.00	3.50	4.00	3.50
60	25.00	25.00	9.50	9.50	5.50	5.75	4.00	4.25	4.00	3.50	4.00	3.50

*Rates stop at eligibility for retirement. For Tier 4, rates at 24 years of service are extended out to 29 years of service.

Annual Rates of Service Retirements				
	Male		Female	
Age	Under 25 Years of Service*	25 Years of Service and Over*	Under 25 Years of Service*	25 Years of Service and Over*
45		25.00%		21.00%
50		19.00		14.50
55		18.00		19.75
60	11.25%	19.00	13.25%	21.50
62	21.00	29.00	18.75	34.00
65	25.50	32.00	30.00	42.25
70	19.50	26.00	23.00	30.00
75	22.00	24.00	21.50	25.00
80	100.00	100.00	100.00	100.00

*For Tier 4 members, 30 years of service.

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

	Annual Rates of		
Service	Merit & Seniority	Base (Economy)	Increase Next Year
0	15.25%	2.65%	17.90%
1	5.25	2.65	7.90
2	2.75	2.65	5.40
3	1.75	2.65	4.40
4	1.25	2.65	3.90
5-7	0.75	2.65	3.40
8-27	0.25	2.65	2.90
28 and Over	0.00	2.65	2.65

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: 0.28% of payroll.

TIMING OF DECREMENTS AND PAY INCREASES: Middle of Year.

ACTIVE MEMBER DISABILITY ASSUMPTION: 12% of active member disabilities are assumed to be in the line of duty and 88% of active member disabilities are assumed to not be in the line of duty.

ACTIVE MEMBER DEATH ASSUMPTION: 4% of active deaths are assumed to be in the line of duty and 96% of active member deaths are assumed to not be in the line of duty.

ACTIVE MEMBER WITHDRAWAL ASSUMPTION: 60% of vested participants who terminate before retirement elect to receive a deferred benefit upon attaining the eligibility requirements for retirement. They are assumed to commence their benefit at age 60 for Tiers 1, 2 and 3 and age 62 for Tier 4. The remaining 40% elect to withdraw their contributions.

FINAL AVERAGE COMPENSATION: 0.25% load on the final average compensation produced by our valuation software.

MARRIAGE ASSUMPTION: 85% married with the husband three years older than his wife.

UNUSED SICK LEAVE: Assumed 0.50 years at retirement.

MILITARY SERVICE: Assumed that participants will have on average 0.25 years of military service at retirement.

MAXIMUM COVERED EARNINGS ASSUMPTION GROWTH: 2.65%

AGE-LIMITED DISABILITY DECREMENTS: Assumed to turn off at age 60.

DEFERRED VESTEDS: Deferred vested benefits are assumed to commence at age 60 for Tiers 1, 2 and 3 and at age 65 for Tier 4.

ASSUMED INTEREST RATE ON EMPLOYEE CONTRIBUTIONS: 2.00%.

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.

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 PERS are determined following a level funding approach and consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded actuarial accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from the PERS. 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 July 1, 2021, as interpreted in preparing the actuarial valuation.

DEFINITIONS

Average Compensation	Average annual covered earnings of an employee during the four highest years of service. To determine the four highest years, PERS considers these scenarios: • Four highest fiscal years of earned compensation; • Four highest calendar years of earned compensation; • Combination of four highest fiscal and calendar years of earned compensation that do not overlap; or • Final 48 months of earned compensation prior to termination of employment.
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 February 1, 1953, active duty military service, out-of-state service, professional leave and non-covered and retroactive service

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	Maximum Covered Earnings	Employee Rate	Maximum Covered Earnings
7/1/10	6/30/11	12.00%	$245,000	9.00%	$245,000
7/1/11	12/31/11	12.00	245,000	9.00	245,000
1/1/12	6/30/12	12.93	245,000	9.00	245,000
7/1/12	6/30/13	14.26	250,000	9.00	250,000
7/1/13	6/30/14	15.75	255,000	9.00	255,000
7/1/14	6/30/15	15.75	260,000	9.00	260,000
7/1/15	6/30/17	15.75	265,000	9.00	265,000
7/1/17	6/30/18	15.75	270,000	9.00	270,000
7/1/18	6/30/19	15.75	275,000	9.00	275,000
7/1/19	6/30/20	17.40	280,000	9.00	280,000
7/1/20	6/30/21	17.40	285,000	9.00	285,000
7/1/21	6/30/22	17.40	290,000	9.00	290,000

Schedule C: Summary of Main Benefit & Contribution Provisions

BENEFITS

Superannuation Retirement

Condition for Retirement	A retirement allowance is paid upon the request of any member who retires and has attained age 60 and completed at least eight years (4 years if hired prior to July 1, 2011) of membership service. A retirement allowance may also be paid upon the completion of 25 years of creditable service for members hired prior to July 1, 2011 or upon the completion of 30 years of creditable service for members hired on or after July 1, 2011.
Amount of Allowance	The annual retirement allowance payable to a member who retires 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. For a member hired prior to July 1, 2011, an employer's annuity which, together with the member's annuity, is equal to 2% of his or her average compensation for each of the first 25 years of creditable service plus 2-1/2% for each year of creditable service over 25 years. 3. For a member hired on or after July 1, 2011, an employer's annuity which, together with the member's annuity, is equal to 2% of his or her average compensation for each of the first 30 years of creditable service plus 2-1/2% for each year of creditable service over 30 years. There will be an actuarial reduction for each year of creditable service below 30 or for each year of age below age 65, whichever is less. For members hired prior to July 1, 2011, the minimum allowance is $120 for each year of creditable service.

Early Retirement

Condition for Retirement	For members hired on or after July 1, 2011, an actuarially reduced retirement allowance is paid upon the request of any member who retires with less than 30 years of creditable service.
Amount of Allowance	The annual actuarially reduced retirement allowance is equal to the benefit in the section above reduced for each year of creditable service below 30 or for each year in age below age 65, whichever is less.

Deferred Vested

Condition for Termination	Any member who withdraws from service prior to his or her attainment of age 60 and who has completed at least eight years (4 years if hired prior to July 1, 2007) of membership service is entitled to receive, in lieu of a refund of his or her accumulated contributions, a retirement allowance.
Amount of Allowance	The annual retirement allowance payable to a member who terminates as a deferred vested payable at age 60 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. For a member hired prior to July 1, 2011, an employer's annuity which, together with the member's annuity, is equal to 2% of his or her average compensation for each of the first 25 years of creditable service plus 2-1/2% for each year of creditable service over 25 years. 3. For a member hired on or after July 1, 2011, an employer's annuity which, together with the member's annuity, is equal to 2% of his or her average compensation for each of the first 30 years of creditable service plus 2-1/2% for each year of creditable service over 30 years. There will be an actuarial reduction for each year of creditable service below 30 or for each year of age below age 65, whichever is less. For members hired prior to July 1, 2011, the minimum allowance is $120 for each year of creditable service.

Disability Retirement

Condition for Retirement	A retirement allowance is paid to a member who is totally and permanently disabled, as determined by the Board of Trustees, and has accumulated eight or more years* of membership service. * four years for those who entered the system before July 1, 2007

Amount of Allowance

For those who were active members prior to July 1, 1992, and did not elect the benefit structure outlined below, the annual disability retirement allowance payable is equal to a superannuation retirement allowance if the member has attained age 60, otherwise it is equal to a superannuation retirement allowance calculated as follows:

1. A member's annuity equal to the actuarial equivalent of his or her accumulated contributions at the time of retirement, plus
2. An employer's annuity equal to the amount that would have been payable had the member continued in service to age 60.

For those who become active members after June 30, 1992, and for those who were active members prior to July 1, 1992, who so elected, the following benefits are payable:

1. A temporary allowance equal to the greater of (a) 40% of average compensation plus 10% for each dependent child up to a maximum of 2, or (b) the member's accrued allowance. This temporary allowance is paid for a period of time based on the member's age at disability, as follows:

Age at Disability	Duration
60 and earlier	to age 65
61	to age 66
62	to age 66
63	to age 67
64	to age 67
65	to age 68
66	to age 68
67	to age 69
68	to age 70
69 and later	one year

   For members hired prior to July 1, 2011, the minimum allowance is $120 per year of creditable service.

2. A deferred allowance commencing when the temporary allowance ceases equal to the greater of (a) the allowance the member would have received based on service to the termination age of the temporary allowance, but not more than 40% of average compensation, or (b) the member's accrued allowance.

   For members hired prior to July 1, 2011, the minimum allowance is $120 per year of creditable service.

Effective July 1, 2004, a temporary benefit can be paid out of a member's accumulated contribution balance while the member is awaiting a determination for eligibility for disability benefits. Future disability payments, if any, would be offset by advanced payments made from the member's accumulated contributions.

Accidental Disability Retirement

Condition for Retirement	A retirement allowance is paid to a member who is totally and permanently disabled in the line of performance of duty.
Amount of Allowance	The annual accidental disability retirement allowance is equal to the allowance payable on disability retirement but not less than 50% of average compensation. There is no minimum benefit.

Accidental Death Benefit

Condition for Benefit	A retirement allowance is paid to a spouse and/or dependent children upon the death of an active member in the line of performance of duty.
Amount of Allowance	The annual retirement allowance is equal to 50% of average compensation payable to the spouse and 25% of average compensation payable to one dependent child or 50% to two or more children until age 19 (23 if a full time student). There is no minimum benefit.

Ordinary Death Benefit

Condition for Benefit	Upon the death of a member who has completed at least eight years* of membership service, a benefit is payable, in lieu of a refund of the member's accumulated contributions, to his or her spouse, if said spouse has been married to the member for not less than one year. *four years for those who entered the system before July 1, 2007.
Amount of Allowance	The annual retirement allowance payable to the lawful spouse of a vested member who dies is equal to the greater of (i) the allowance that would have been payable had the member retired and elected Option 2, reduced by an actuarially determined factor based on the number of years the member lacked in qualifying for unreduced retirement benefits, or (ii) a lifetime benefit equal to 20% of the deceased member's average compensation, but not less than $50 per month. In addition, a benefit is payable to dependent children until age 19 (23 if a full time student). The benefit is equal to the greater of 10% of average compensation or $50 per month for each dependent child up to 3.

Return of Contributions	Upon the withdrawal of a member without a retirement benefit, his or her contributions are returned to him or her, together with accumulated regular interest thereon. Upon the death of a member before retirement, his or her contributions, together with the full accumulated regular interest thereon, are paid to his or her designated beneficiary, if any, otherwise, to his or her estate provided no other survivor benefits are payable. 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	The normal form of benefit (modified cash refund) is an allowance payable during the life of the member with the provision that upon his or her death the excess of his or her total contributions at the time of retirement over the total retirement annuity paid to him or her will be paid to his or her designated beneficiary.
Optional Benefits	A member upon retirement may elect to receive his or her 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 PERS 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.

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 hired prior to July 1, 2011 and who has at least 28 years of creditable service* or a member hired on or after July 1, 2011 who has at least 33 years of creditable service can 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 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 the partial lump-sum 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.

* or at least age 63 with four years of membership service for those who entered the system before July 1, 2007.

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 55*, plus (b) 3% compounded for each year thereafter beginning with the fiscal year in which the member turns age 55*.

*Age 60 for members hired on or after July 1, 2011

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.

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	Inactive NonVested	Inactive Vested	Retirees	Disableds	Survivors	
From PERS	148,990	65,885	15,309	93,583	6,391	12,243	342,401
Return to Active Status				(1)			(1)
Deceased			(16)	(5)		(3)	(24)
Certain Period Ended						(112)	(112)
Added Back			41	53	3	6	103
Pay less than $100	(1,084)	1,015	68				(1)
Not Contributing	(2,233)	1,810	374				(49)
Balance = 0		(679)					(679)
Status Change		(5)	(2)				(7)
In Retiree Status			(35)				(35)
In Disabled Status			(14)				(14)
Pending Retirees			1,150				1,150
Suspended Beneficiaries			12				12
For Valuation	145,673	68,026	16,887	93,630	6,394	12,134	342,744

Schedule D: Detailed Tabulations of the Data

STATUS RECONCILIATION FROM 2020 TO 2021

Reconciliation of Data from Last Year to This Year					Inactives		
	Actives	Retirees	Disableds	Survivors	Vested	Non-Vested	Total
As of June 30, 2020	149,855	91,642	6,471	11,768	16,436	62,211	338,383
Retirement	(3,350)	5,198	(1)		(1,846)	(1)	
Disabled	(160)	(7)	228		(59)	(2)	
Death with Survivor	(127)	(681)	(55)	1,072	(41)	(11)	157
Terminated Vested	(3,404)			(11)	3,478	(63)	
Terminated Non-Vested	(8,057)					8,057	
Return to Active Service	2,898	(44)			(653)	(2,201)	
Refunded	(5,444)				(388)	(2,837)	(8,669)
Death No Survivor	(35)	(2,483)	(249)	(593)	(13)	(5)	(3,378)
Benefit Ended				(108)	(5)		(113)
Removed/Cleanup					(26)	(72)	(98)
New	13,497						13,497
Pickups		5		6	4	2,950	2,965
As of June 30, 2021	145,673	93,630	6,394	12,134	16,887	68,026	342,744

Schedule D: Detailed Tabulations of the Data

Retirants & Beneficiaries as of June 30, 2021
Tabulated by Year of Retirement

Year of Retirement Ending June 30	No.	Total Annual Benefits, excluding COLA	COLA	Total Annual Benefits	Average Monthly Total Benefit
2021	5,100	$111,156,787	$121,074	$111,277,861	$1,818
2020	5,136	113,738,974	1,439,210	115,178,184	1,869
2019	5,279	115,275,439	4,928,243	120,203,682	1,898
2018	5,348	111,854,858	8,107,963	119,962,821	1,869
2017	5,249	107,234,557	11,065,326	118,299,883	1,878
2016	5,383	112,714,472	15,240,259	127,954,731	1,981
2015	4,986	100,794,219	17,090,568	117,884,787	1,970
2014	5,453	108,842,779	22,291,863	131,134,642	2,004
2013	5,181	103,124,979	24,906,166	128,031,145	2,059
2012	5,433	108,502,796	30,052,268	138,555,064	2,125
2011	5,295	107,653,844	34,130,030	141,783,874	2,231
2010	4,493	86,599,324	30,530,143	117,129,467	2,172
2009	3,761	71,369,077	28,088,746	99,457,823	2,204
2008	4,042	77,018,692	33,206,581	110,225,273	2,272
2007	3,763	69,542,614	32,785,604	102,328,218	2,266
2006	3,709	64,784,703	33,147,488	97,932,191	2,200
2005	3,367	60,613,292	33,752,501	94,365,793	2,336
2004	3,486	61,293,057	37,272,511	98,565,568	2,356
2003	3,168	55,379,478	36,144,376	91,523,854	2,408
2002	3,131	51,688,459	36,226,257	87,914,716	2,340
2001	2,928	49,309,983	36,972,426	86,282,409	2,456
2000	2,231	36,690,059	29,558,772	66,248,831	2,475
1999	1,905	29,784,155	25,573,275	55,357,430	2,422
1998	1,916	29,020,554	26,380,560	55,401,114	2,410
1997	1,848	26,678,974	25,841,261	52,520,235	2,368
1996	1,787	25,645,683	26,409,615	52,055,298	2,427
1995	1,397	18,442,504	20,059,252	38,501,756	2,297
1994	1,239	15,850,061	18,091,085	33,941,146	2,283
1993	1,274	17,066,009	20,770,477	37,836,486	2,475
1992	1,299	17,202,179	22,012,050	39,214,229	2,516
1991	705	8,596,938	11,760,286	20,357,224	2,406
1990	673	6,995,414	9,940,179	16,935,593	2,097
1989	248	2,250,245	3,343,040	5,593,285	1,879
1988	342	3,350,831	5,173,458	8,524,289	2,077
1987	432	4,613,142	7,798,140	12,411,282	2,394
1986 & Prior	1,171	8,386,124	16,207,550	24,593,674	1,750
Totals	112,158	$2,099,065,255	$776,418,603	$2,875,483,858	$2,136

Schedule D: Detailed Tabulations of the Data

Schedule of Retired Members by Type of Benefit

Benefits Payable June 30, 2021

Amount of Monthly Benefit**	Number of Rets.	Ret. Type 1*	Ret. Type 2*	Ret. Type 3*
$1-$500	21,614	16,049	851	4,714
501-1,000	22,168	16,747	2,108	3,313
1,001-1,500	19,581	16,119	1,612	1,850
1,501-2,000	16,596	14,687	952	957
2,001-2,500	12,540	11,528	458	554
2,501-3,000	7,627	7,147	204	276
3,001-3,500	4,836	4,549	91	196
3,501-4,000	2,635	2,470	58	107
4,001-4,500	1,674	1,577	36	61
4,501-5,000	897	855	9	33
Over 5,000	1,990	1,902	15	73
Totals	112,158	93,630	6,394	12,134

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

**Reflects reduced benefit

Schedule of Retired Members by Option

Benefits Payable June 30, 2021

Amount of Monthly Benefit**	Number of Rets.	Life	Option 1	Option 2	Option 3	Option 4	Option 4A	Option 4B	Option 4C*	Option 5	PLSO 1 Year*	PLSO 2 Years*	PLSO 3 Years*
$1-$500	21,614	15,646	670	2,610	197	177	430	1,853	147	31	584	480	2,187
501-1,000	22,168	15,553	673	2,932	209	271	898	1,577	702	55	905	651	2,144
1,001-1,500	19,581	12,712	638	3,049	223	328	1,107	1,470	866	54	888	768	3,046
1,501-2,000	16,596	10,335	458	2,713	150	369	1,203	1,344	390	24	788	828	3,601
2,001-2,500	12,540	7,573	301	2,066	103	273	1,156	1,051	107	17	830	705	2,965
2,501-3,000	7,627	4,619	170	1,209	44	200	702	670	41	13	600	458	1,697
3,001-3,500	4,836	2,894	108	788	26	131	481	401	16	7	475	338	939
3,501-4,000	2,635	1,597	58	439	14	59	261	207	8	0	272	178	452
4,001-4,500	1,674	935	28	304	6	56	217	128	3	0	165	109	312
4,501-5,000	897	510	12	162	4	27	117	65	2	0	83	45	163
Over 5,000	1,990	966	22	452	8	102	292	148	2	0	165	87	309
Totals	112,158	73,340	3,138	16,724	984	1,993	6,864	8,914	2,284	201	5,755	4,647	17,815

<u>Option Selected</u>

Life	-	Return of Contributions
Opt. 1	-	Return 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. 5	-	Pop-Up
PLSO	-	Partial Lump Sum Option*

*Included in other options
** Reflects reduced benefit

Schedule D: Detailed Tabulations of the Data

Retirant and Beneficiary Information June 30, 2021
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					416	$2,007,908	416	$2,007,908
20 – 24					203	1,240,273	203	1,240,273
25 – 29					99	901,506	99	901,506
30 – 34			2	35,046	115	1,284,068	117	1,319,114
35 – 39			44	725,205	195	2,194,111	239	2,919,316
40 – 44	9	191,014	123	2,263,966	271	3,203,680	403	5,658,660
45 – 49	491	14,256,968	277	5,412,490	363	4,190,354	1,131	23,859,812
50 – 54	2,669	81,495,228	590	12,284,770	519	7,041,056	3,778	100,821,054
55 – 59	5,404	172,021,539	1,002	21,066,308	707	9,866,545	7,113	202,954,392
60 – 64	13,307	351,703,844	1,292	27,127,097	1,039	16,789,920	15,638	395,620,861
65 – 69	20,775	542,100,170	1,290	26,388,680	1,367	25,427,109	23,432	593,915,959
70 – 74	21,692	583,691,370	969	19,066,978	1,795	36,295,718	24,456	639,054,066
75 – 79	13,934	375,679,766	457	9,506,587	1,632	35,177,175	16,023	420,363,528
80 – 84	8,505	223,569,360	232	4,005,004	1,534	37,097,466	10,271	264,671,830
85 – 89	4,381	111,539,833	95	1,526,522	1,129	27,763,342	5,605	140,829,697
90 – 94	1,926	48,732,703	19	299,839	576	13,015,815	2,521	62,048,357
95	170	4,111,692			44	960,140	214	5,071,832
96	127	3,093,151			44	1,227,484	171	4,320,635
97	84	1,818,816	1	16,185	21	554,616	106	2,389,617
98	50	1,516,949			17	422,434	67	1,939,383
99	27	517,832	1	21,556	22	481,509	50	1,020,897
100 & Over	79	1,940,641			26	614,520	105	2,555,161
Totals	93,630	$2,517,980,876	6,394	$129,746,233	12,134	$227,756,749	112,158	$2,875,483,858

Average Age:	70.6 years
Average Age at Retirement:	59.3 years
Average Age at Death:	80.4 years
Average Years Since Retirement:	12.3 years

Schedule D: Detailed Tabulations of the Data

Total Active Members as of June 30, 2021
Tabulated by Attained Ages and Years of Service

Attained Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Over	Total No.	Total Payroll
Under 20	310							310	$ 6,278,043
20 to 24	5,820	43						5,863	173,390,605
25 to 29	10,691	2,521	19					13,231	475,376,639
30 to 34	7,138	6,709	1,667	37				15,551	623,502,766
35 to 39	5,856	4,740	5,351	1,799	48			17,794	777,301,457
40 to 44	5,143	4,049	3,825	5,002	1,661	23		19,703	919,367,298
45 to 49	4,420	3,566	3,239	3,368	4,161	1,061	16	19,831	942,376,731
50 to 54	4,078	3,185	2,907	2,972	3,125	2,245	475	18,987	873,035,281
55 to 59	3,323	2,873	2,507	2,642	2,685	1,576	1,038	16,644	719,883,032
60 to 64	2,164	2,232	1,787	1,698	1,698	1,066	959	11,604	487,902,990
65 to 69	858	937	649	545	436	302	371	4,098	168,508,362
70 & Over	480	401	333	287	227	120	209	2,057	79,153,637
Total Count	50,281	31,256	22,284	18,350	14,041	6,393	3,068	145,673	$ 6,246,076,841

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

Age:	45.1 years
Service:	10.5 years
Entry Age:	35 years
Annual Payroll:	$42,877

Schedule E: Analysis of Financial Experience

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

Type of Activity	$ Gain (or Loss) For Year Ending 6/30/2021	$ Gain (or Loss) For Year Ending 6/30/2020
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	$ 12.4	$ 86.9
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	1.4	3.3
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	(1.5)	(1.9)
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(213.5)	(185.6)
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	50.4	(20.0)
New Members. Additional unfunded accrued liability will produce a loss.	(63.8)	(67.3)
Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.	1,319.9	(283.2)
Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.	72.9	(20.2)
Other. Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, etc.	(146.1)	15.8
Gain (or Loss) During Year From Financial Experience	$ 1,032.1	$ (472.2)
Non-Recurring Items. Adjustments for plan amendments, software changes, assumption changes, or method changes.	(1,405.0)	0.0
Composite Gain (or Loss) During Year	$ (372.9)	$ (472.2)

The purpose of the funding policy is to state the overall funding goals and objectives for the Public Employees' Retirement System of Mississippi (PERS), and to document both the metrics that will be used to measure progress toward achieving those goals, and the methods and assumptions employed to develop the metrics.

The employer contribution rate for PERS will be set based on the metrics, assumptions and methods outlined in Section II and III of this policy.

I. Funding Goals and Objectives

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

- Preservation of the defined benefit structure for providing lifetime benefits to the PERS membership,
- Contribution rate stability as a percentage of payroll (Fixed Contribution Rate – FCR),
- Maintain an increasing trend in the funded ratio over the projection period with an ultimate goal of being 100% funded,
- Require clear reporting and risk analysis of the metrics by the actuary as outlined in Section II of this policy using a "Signal Light" approach to assist the Board in determining whether increases or decreases are needed in the employer contribution rate, and
- Ensure benefit improvements are funded through increases in contribution requirements in accordance with Article 14, S 272A, of the Mississippi Constitution.

II. Metrics

To track progress in achieving the outlined funding goals and objectives and to assist the Board in making a determination whether an increase or decrease in the employer contribution rate for PERS should be considered, certain metrics will be measured annually in conjunction with information provided in the actuarial valuation and projection report. As part of the annual valuation and projection reports, each metric will be calculated and assigned a "Signal Light" with the following definitions:

Status	Definition
Green	Plan passes metric and PERS' funding goals, and objectives are achieved
Yellow	Plan passes metric but a warning is issued that negative experience may lead to failing status
Red	Plan fails metric and PERS must consider contribution increases

If any one of the metrics are in the Red Signal Light status in conjunction with the annual valuation report and the projection report, the actuary will determine and recommend to the Board an employer contribution rate increase to consider that is sufficient enough to get all three metrics back into the Green Signal Light status. The employer contribution rate increase would be effective for the July 1st, 18 months following the completion of the projection report (e.g., if the projection report in 2019 deems an increase to be considered, then it would be effective for July 1, 2021).

The following metrics will be measured:

- **Funded Ratio** – Funded Ratio is defined as the actuarial value of assets divided by the actuarial accrued liability. One of the funding goals is to have an increasing funded ratio over the projection period with an ultimate goal of having a 100 percent funded ratio. The Board sets the Signal Light definition as follows:

Status	Definition
Green	Funded Ratio above 80% in 2047
Yellow	Funded Ratio between 65% and 80% in 2047
Red	Funded Ratio below 65% in 2047

- **Cash flow as a percentage of assets** – Cash flow as a percentage of assets is defined as the difference between total contributions coming into the trust and the benefit payments made to retirees and beneficiaries going out of the trust as a percentage of beginning year market value of assets. Over the projection period, this percentage will fluctuate from year to year so for Signal Light testing, the net cash flow percentage over the entire projection period will be tested. The Board sets the Signal Light definition as follows:

Status	Definition
Green	Net Cash Flow Percentage above negative 5.80% (-5.80%) during the projection period
Yellow	Net Cash Flow Percentage between negative 5.80% (-5.80%) and negative 7.55% (-7.55%) during the projection period
Red	Net Cash Flow Percentage below negative 7.55% (-7.55%) during the projection period

- **Actuarially Determined Contribution (ADC)** – ADC is defined as the contribution requirement determined by the actuary using a contribution allocation procedure based on the principal elements disclosed in Section III of this funding policy:

  1. Actuarial Cost Method
  2. Asset Smoothing Method
  3. Amortization Method

  The calculation of the ADC will be determined during the actuarial valuation and not during the projection report. The ratio of the ADC to the fixed contribution rate (ADC/FCR) as set by this Funding Policy will be tested. The Board sets the Signal Light definition as follows:

Status	Definition
Green	ADC ratio at or below 100% of fixed contribution rate at valuation date
Yellow	ADC ratio between 100% and 110% of fixed contribution rate at valuation date
Red	ADC ratio above 110% of fixed contribution rate at valuation date

III. Assumptions and Methods

Each year, the actuary will perform an actuarial valuation and projection report for funding purposes. During the process, the actuary shall calculate all the metrics listed in Section II of this funding policy and PERS' Signal Light status for each metric. The following three major components of a funding valuation will be used:

- **Actuarial Cost Method** – This component determines the attribution method upon which the cost/liability of the retirement benefits are allocated to a given period, defining the normal cost or annual accrual rate associated with projected benefits. The Entry Age Normal Cost Method (EAN) is to be used for determination of the normal cost rate and the actuarial accrued liability for purposes of calculating the Actuarial Determined Contribution (ADC).
- **Asset Valuation Method** – This component dictates the method by which the asset value, used in the determination of the Unfunded Actuarial Accrued Liability (UAAL) and Funded Ratio, is determined. The asset valuation method to be used shall be a five-year smoothed market value of assets. The difference between the actual market value investment returns and the expected market investment returns is recognized equally over a five-year period.

- **Amortization Method** – This component prescribes, in terms of duration and pattern, the systematic manner in which the difference between the accrued liability and the actuarial value of assets is reduced. For purposes of calculating the ADC metric, the following amortization method assumptions are used:
  - I. Once established for any component of the UAAL, the amortization period for that component will be closed and will decrease by one year annually.
  - II. The amortization payment will be determined on a level percentage of pay basis.
  - III. The length of the amortization periods will be as follows:
    - a. Existing UAAL on June 30, 2018 – 30 years.
    - b. Annual future actuarial experience gains and losses, assumption changes or benefit enhancements or reductions – 25 years from the date of the valuation.
  - IV. If any future annual actuarial valuation indicates that PERS has a negative UAAL, the ADC shall be set equal to the Normal Cost.
- **Actuarial Assumptions** – The actuarial assumptions are used to develop the annual and projected actuarial metrics, as well as the ADC rates. The actuarial assumptions are derived and proposed by the actuary and adopted by the PERS' Board in conformity with the *Actuarial Standards of Practice*. The actuarial assumptions for this funding policy were developed using the experience for the four-year period ending June 30, 2020 (State of Mississippi Retirement Systems Experience Investigation for the Four-Year Period Ending June 30, 2020). The long-term investment return assumption adopted by the PERS' Board in conjunction with the experience investigation is 7.55 percent and, upon approval by the Board, will be reduced until it reaches the rate recommended by the actuary in the most recent experience study using investment gains based on the following parameters:
  - 2% Excess return over assumed rate, lower assumption by 5 basis points,
  - 5% Excess return over assumed rate, lower assumption by 10 basis points,
  - 8% Excess return over assumed rate, lower assumption by 15 basis points,
  - 12% Excess return over assumed rate, lower assumption by 20 basis points.

IV. Governance Policy/Process

Below is a list of specific actuarial and funding related studies, the frequency at which they should be commissioned by the Board and additional responsibilities related to each:

- **Actuarial Valuation (performed annually)** – The Board is responsible for the review of PERS' annual actuarial valuation report, which provides the annual funded ratio and the calculation of the ADC.
- **Projection Report (performed annually)** – The Board is responsible for the review of PERS' 30-year projection report, which will include the actuarial metrics and Signal Light status for each metric over a 30-year period.
- **Experience Analysis (performed every two years on a rolling four-year)** – The Board is responsible for ensuring that an experience analysis is performed as prescribed, review of the results of the study, and approving the actuarial assumptions and methodologies to be used for all actuarial purposes relating to the defined benefit pension plan.
- **Actuarial Audit (performed at least every five years)** – The Board is responsible for the review of an audit report performed by a new actuarial firm to provide a critique of the reasonableness of the actuarial methods and assumptions in use and the resulting actuarially computed liabilities and contribution rates.
- **Funding Policy Review (performed at least annually)** – The Board is responsible for the periodic review of this policy, but at least annually following the Projection Report and biennially following the Experience Analysis.

V. Glossary of Funding Policy Terms

- **Actuarial Accrued Liability (AAL):** The AAL is the value at a particular point in time of all past normal costs. This is the amount of assets the plan would have today if the current plan provisions, actuarial assumptions, and participant data had always been in effect, contributions equal to the normal cost had been made, and all actuarial assumptions had been met.
- **Actuarial Cost Method:** The actuarial cost method allocates a portion of the total cost (present value of benefits) to each year of service, both past service and future service.
- **Actuarial Determined Contribution (ADC):** The potential payment to the plan as determined by the actuary using a contribution allocation procedure that, if contributed consistently and combined with investment earnings, would be sufficient to pay promised benefits in full over the long term. The ADC may or may not be the amount actually paid by the plan sponsor or other contributing entity.
- **Asset Values**:
  - **Actuarial Value of Assets (AVA):** The AVA is the market value of assets less the deferred investment gains or losses not yet recognized by the asset smoothing method.

  - **Market Value of Assets (MVA):** The MVA is the fair value of assets of the plan as reported in the plan's audited financial statements.

- **Entry Age Normal Actuarial Cost Method (EAN):** The EAN actuarial cost method is a funding method that calculates the normal cost as a level percentage of pay or level dollar amount over the working lifetime of the plan's members.

- **Funded Ratio:** The funded ratio is the ratio of the plan assets to the plan's actuarial accrued liabilities.
  - **Actuarial Value Funded Ratio:** is the ratio of the AVA to the AAL.

- **Normal Cost**: The normal cost is the cost allocated under the actuarial cost method to each year of active member service.

- **Present Value of Benefits (PVB) or total cost:** The PVB is the value at a particular point in time of all projected future benefit payments for current plan members. The future benefit payments and the value of those payments are determined using actuarial assumptions regarding future events. Examples of these assumptions are estimates of retirement and termination patterns, salary increases, investment returns, etc.

- **Surplus:** A surplus refers to the positive difference, if any, between the AVA and the AAL.

- **Unfunded Actuarial Accrued Liability (UAAL):** The UAAL is the portion of the AAL that is not currently covered by the AVA. It is the positive difference between the AAL and the AVA.

- **Valuation Date:** The valuation date is the annual date upon which an actuarial valuation is performed; meaning that the trust assets and liabilities of the plan are valued as of that date. PERS' annual valuation date is June 30.

Schedule G: History of PERS Plan Provisions

Since 1985, the benefit structure of the Public Employees Retirement System (PERS) of Mississippi has undergone significant changes as noted in the table below.

Fiscal Year Beginning	Benefit Modifications
July 1, 1985	• Final average compensation calculated using the highest four consecutive years (reduced from highest five consecutive years) • Liberalized survivor benefit provision to reduce the marriage requirement from 5 years to 1 year and to allow a member to designate a child as beneficiary • Minimum benefit increased from $5.00 to $7.50 per month for each year of creditable service for current and future retirees • Eligibility for service retirement reduced from 10 years to 4 years at age 60 • Established "discretionary" COLA provision in addition to the base COLA provision to be paid to eligible retirees based on sufficient actuarial gains • 3% ad hoc increase for all retirees
July 1, 1986	• Eligibility for non-duty related disability retirement reduced from 10 years to 4 years • Permanent exemption from 3% penalty for those required to retire at age 60 • Retirement incentive granted – one additional year of credit to any member with 30 years of service credit or age 60
July 1, 1987	• Established service retirement eligibility based on 25 & out with reduced benefits • Benefit accrual increased from 1-5/8% to 1-3/4% for the first 20 years • Minimum benefit increased from $7.50 to $10.00 per month for each year of service for current and future retirees • 5% ad hoc increase for all retirees • Provided elected official leave credit
July 1, 1989	• Unreduced retirement at age 55 with 25 years of service • Benefit accrual increased from 1-3/4% to 1-7/8% for the first 30 years of service • Unreduced retirement lowered from age 65 to age 60 • 5% ad hoc increase for all retirees
July 1, 1990	• Provided that base COLA percentage granted shall be cumulative from year to year
July 1, 1991	• Unreduced retirement at any age with 25 years of service • Benefit accrual increased to 2% for all years of service over 25

Schedule G: History of PERS Plan Provisions

Fiscal Year Beginning	Benefit Modifications
July 1, 1992	• Ad hoc increase for those retired prior to July 1, 1991, with more than 25 years of service • Tiered disability benefit • Expanded survivor benefits to include automatic spousal and dependent child benefits • Liberalized definition of average compensation to provide that the highest four years did not have to be consecutive years • Expanded military service credit to include all active duty military • Removed reference to "Governor's Salary" and established maximum compensation cap at $125,000
July 1, 1994	• Benefits for all retirees under Options 2(5) and 4A(5) were recalculated to remove the reduction imposed for the right to revert to the Maximum
July 1, 1999	• Benefit accrual increased from 2% to 2-1/4% for all years of service over 25 for current and future retirees • Base COLA increased to 3% simple up to age 55 and 3% compounded after age 55 • Reemployed retiree COLA will be based on all fiscal years in retirement, not just the fiscal years in retirement since the last retirement. • Provided that the COLA will be prorated and paid to the beneficiary of a retiree or beneficiary who is receiving the COLA in a lump sum and who dies between July 1 and December 1
July 1, 2000	• Benefit accrual increased from 1-7/8% to 2% for all years of service over 10 and less than 25 for current and future retirees
July 1, 2001	• Benefit accrual increased from 1-7/8% to 2% for all years of service over 5 and less than 25 for current and future retirees
July 1, 2002	• Benefit accrual increased from 1-7/8% to 2% for all years of service up to and including 25 and from 2-1/4% to 2-1/2% for all years of service over 25 for current and future retirees • Increased maximum compensation cap to $150,000 • Provided for free active duty military service for pre-1972 service in the Commissioned Corps of the U.S. Public Health Service for those retiring on or after July 1, 2002 • Reemployed retiree who has previously been retired for at least one full fiscal year no longer has to wait another full fiscal year for his or her COLA to resume • A local county or municipal elected official who is receiving retirement benefits may receive a salary for the elected position that does not exceed 25% of the retiree's average compensation

Schedule G: History of PERS Plan Provisions

Fiscal Year Beginning	Benefit Modifications
July 1, 2004	• Removed remarriage penalty on certain spouse / survivor benefits and provided upon application for the reinstatement of spouse survivor benefits previously terminated due to remarriage
July 1, 2008	• Maximum reportable earned compensation was increased from \$150,000 to \$230,000 to coincide with the compensation limit set pursuant to Section 401(a)(17) of the Internal Revenue Code • Vesting requirement for those employees hired on or after July 1, 2007 was increased from 4 to 8 years of service.
July 1, 2010	• Members who retire on or after July 1, 2010 receive additional credit toward retirement for one-half day of leave for each full fiscal year of membership service accrued after June 30, 2010 • Option 4, a 75% joint and survivor annuity, made available to members who retire on or after January 1, 2011
July 1, 2011	• For members hired on or after July 1, 2011, 30 years of creditable service will be required for retirement regardless of age. • For members hired on or after July 1, 2011, 33 years of creditable service will be required to select a partial lump sum option at retirement. • For members hired on or after July 1, 2011, the retirement formula will be 2% of average compensation for the first 30 years of creditable service plus 2.5% of average compensation for each year beyond 30 years of creditable service. • For members hired on or after July 1, 2011, the actuarial reduction for early retirement will be the lesser of the number of years below 30 years of creditable service or the number of years in age a member is below age 65. • For members hired on or after July 1, 2011, the COLA will be a simple 3% of the annual retirement allowance at retirement up to the fiscal year in which the retired member reaches age 60. Thereafter, the COLA will be a compounded 3% for all future years.
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.

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

Prepared as of June 30, 2021

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The experience and dedication you deserve

December 8, 2021

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 (MHSPRS). 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, 2021. The results may not be applicable for other purposes.

The date of the valuation was June 30, 2021.

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.

Since the previous valuation, the Board adopted new actuarial assumptions based on the experience investigation for the four-year period ending June 30, 2020. The results of this study were presented to the Board in April, 2021 and the Board adopted the demographic assumption recommendations with regard to the rates of mortality, retirement, withdrawal, and salary merit scale and adopted the economic assumption recommendations with regards to the investment return, price inflation, and wage inflation assumptions at its August, 2021 meeting. The complete list of new actuarial assumption changes is shown on pages 2 and 3 of this report.

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.

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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.

Future actuarial results may differ significantly from the current results 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. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

In order to prepare the results in this report we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information, but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments that we believe would be appropriate due to the pandemic.

This actuarial valuation was performed to determine the adequacy of statutory contributions 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.

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: Summary of Principal Results

1. This report, prepared as of June 30, 2021, 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, 2021. 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.

VALUATION DATE	June 30, 2021	June 30, 2020
Investment Return Assumption	**7.55%**	**7.75%**
Active members included in valuation		
Number	478	511
Annual compensation	$ 29,780,428	$ 32,345,730
Retirees		
Number	761	740
Annual allowances	$ 35,443,890	$ 33,344,108
Assets		
Market related actuarial value	$ 403,748,000	$ 373,511,000
Market value	$ 463,984,000	$ 364,102,000
Unfunded actuarial accrued liability (UAAL)	$ 169,385,895	$ 188,151,296
Funded Ratio	70.4%	66.5%
Employer contribution rate		
Normal Cost*	16.29%	15.69%
Accrued liability	32.79	33.39
Total	49.08%	49.08%
Anticipated accrued liability payment period	21.0 years	21.7 years
Unfunded actuarial accrued liability based on Market value of assets	$ 109,149,895	$ 197,560,296
Funded Ratio	81.0%	64.8%
Payment period	7.1 years	23.6 years

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

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

3. Comments on the valuation results are given in Section IV, the derivation of the experience gains and losses during the valuation year are given in Section V and the rates of contribution payable by employers are given 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 2021 fiscal year, the total additional fees were $3,544,000. We have kept our expected contributions from these sources at $3,700,000 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 21.0 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 34.2 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 50.97%.

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, 2021 on an actuarial value of assets basis was 12.61%, compared to the assumed rate of return for the period of 7.75%.

6. Since the previous valuation, various economic and demographic assumptions have been revised. The changes are summarized below and shown in more detail in Schedule B:
   - The expectation of retired life mortality was changed to the PubS.H-2010(B) Retiree Table with the following adjustments:
     - For males, 95% of male rates up to age 60, 110% for ages 61 to 75, and 101% for ages above 77.
     - For females, 84% of female rates up to age 72 scaled up to 100% for ages above 76.
     - Projection scale MP-2020 will be used to project future improvements in life expectancy generationally.

Section I: Summary of Principal Results

- The expectation of contingent life mortality was changed to the PubS.H-2010(B) Contingent Annuitant Table with the following adjustments:
    - For males, 97% of male rates for all ages.
    - For females, 110% of female rates for all ages.
    - Projection scale MP-2020 will be used to project future improvements in life expectancy generationally.
- The expectation of disabled mortality was changed to PubG.H-2010 Disabled Retiree Table for disabled retirees with the following adjustments:
    - For males, 134% of male rates at all ages.
    - For females, 121% of female rates at all ages.
    - Projection scale MP-2020 will be used to project future improvements in life expectancy generationally.
- The investment rate of return assumption was reduced from 7.75% to 7.55%.
- The price inflation assumption was reduced from 2.75% to 2.40%.
- The wage inflation assumption was reduced from 3.00% to 2.65%.
    - Withdrawal rates, pre-retirement mortality rates, disability rates, service retirement rates, and salary merit scale were also adjusted to reflect actual experience more closely.

7. Schedule C gives a summary of the benefit and contribution provision of the System. There have been no changes since the previous valuation.

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 table on page 4 provides a ten-year history of some pertinent figures.

Section I: Summary of Principal Results

Comparative Schedule

	Active Members				Retired Lives				Valuation Results ($ thousands)		
Valuation Date June 30	Number	Payroll ($ in thousands)	Average Salary	% increase from previous year	Number	Active/ Retired Ratio	Annual Benefits ($ thousands)	Benefits as % of Payroll	Accrued Liability	Valuation Assets	UAAL
2012	547	$25,670	$46,929	(2.8)%	713	0.8	$25,167.9	98.0%	$421,415	$268,424	$152,991
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

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, 2021 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	$ 29,780,428	$62,302	41.7	12.8

Of the 478 active members, 353 are vested and 125 are non-vested.

Retired Lives

			Group Averages	
Type of Benefit Payment	**No.**	**Annual Benefits**	**Benefit**	**Age**
Retirement	575	$30,666,559	$53,333	68.0
Disability	13	339,114	26,086	65.0
Survivor	173	4,438,217	25,654	74.4
Total in HSPRS	761	$35,443,890	$46,575	69.4

Deferred Vested/Inactive Lives

Type of Member	No.	Deferred Benefits	Outstanding Balance
Deferred Vested – Benefit Included	40	$988,937	N/A
Inactive	24	N/A	$301,060
Total in HSPRS	64	$988,937	$301,060

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, 2021 and, for comparison purposes, as of the immediately preceding valuation date of June 30, 2020. 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, 2021	JUNE 30, 2020
ASSETS		
Current actuarial value of assets:		
Annuity Savings Account	$ 24,844,307	$ 26,382,246
Annuity Reserve	46,621,071	42,345,345
Employers' Accumulation Account	332,282,622	304,783,409
Total current assets	$ 403,748,000	$ 373,511,000
Future member contributions to Annuity Savings Account	$ 18,258,055	$ 19,581,350
Prospective contributions to Employer's Accumulation Account		
Normal contributions	$ 40,318,822	$ 41,701,524
Unfunded actuarial accrued liability contributions	169,385,895	188,151,296
Total prospective contributions	$ 209,704,717	$ 229,852,820
Total assets	$ 631,710,772	$ 622,945,170
LIABILITIES		
Present value of benefits payable on account of present retired members and beneficiaries	$ 417,468,199	$ 389,268,876
Present value of benefits payable on account of inactive members for service rendered before the valuation date	11,260,140	12,965,403
Present value of benefits payable on account of active members	$ 202,982,433	$ 220,710,891
Total liabilities	$ 631,710,772	$ 622,945,170

Section III: Valuation Balance Sheet

BREAKDOWN OF TOTAL AND ACCRUED LIABILITIES
AS OF JUNE 30, 2021

	Total Liability	Accrued Liability
Active Members		
Retirement	$ 193,509,907	$ 143,665,927
Death	2,959,669	298,875
Disability	1,275,736	62,353
Termination	5,237,121	378,401
Total	$ 202,982,433	$ 144,405,556
Retirees		
Retirement	$ 376,995,325	$ 376,995,325
Survivor	36,960,109	36,960,109
Disability	3,512,765	3,512,765
Total	$ 417,468,199	$ 417,468,199
Deferred Vested Members	10,658,020	10,658,020
Inactive Members	602,120	602,120
Total Actuarial Values	$ 631,710,772	$ 573,133,895
Actuarial Value of Assets		403,748,000
Unfunded Actuarial Accrued Liability		$ 169,385,895

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, 2021.

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 $24,844,307. The assets credited to the Annuity Reserve were $46,621,071 and the assets credited to the Employer's Accumulation Account totaled $332,282,622. Current actuarial assets as of the valuation date equaled the sum of these three funds, $403,748,000. Future member contributions to the Annuity Savings Account were valued to be $18,258,055. Prospective contributions to the Employer's Accumulation Account were calculated to be $209,704,717 of which $40,318,822 is attributable to service rendered after the valuation date (normal contributions) and $169,385,895 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 $631,710,772 as of June 30, 2021.

Total Liabilities

The present value of benefits payable on account of presently retired members and beneficiaries totaled $417,468,199 as of the valuation date. The present value of future benefit payments on behalf of active members amounted to $202,982,433. In addition, the present value of benefits for inactive members, due to service rendered before the valuation date, was calculated to be $11,260,140.

Therefore, the balance sheet shows the present value for all prospective benefit payments under the System to be $631,710,772 as of June 30, 2021.

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, 2021 valuation is 21.0 years, compared to 21.7 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) coincide 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. Detail on the derivation of the experience gain/(loss) for the years ended June 30, 2021 and June 30, 2020 are shown below.

		2021 Valuation $ Thousands	2020 Valuation $ Thousands
(1)	UAAL* as of beginning of year	$ 188,151.3	$ 179,334.5
(2)	Total normal cost from last valuation	7,643.1	7,521.6
(3)	Total contributions	21,940.0	22,572.0
(4)	Interest accrual: [[(1) + (2)] x .0775] - [(3) x .03875]	14,323.9	13,606.6
(5)	Expected UAAL before changes: (1) + (2) – (3) + (4)	$ 188,178.3	$ 177,890.7
(6)	Change due to plan amendments	0.0	0.0
(7)	Change due to actuarial assumptions or methods	2,545.6	0.0
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 190,723.9	$ 177,890.7
(9)	Actual UAAL as of end of year	$ 169,385.9	$ 188,151.3
(10)	Gain/(loss): (8) – (9)	$ 21,338.0	$ (10,260.6)
(11)	Gain/(loss) as percent of actuarial accrued liabilities at start of year.	3.8%	(1.9)%

*Unfunded actuarial accrued liability.

Valuation Date June 30	Actuarial Gain/(Loss) as a % of Beginning Accrued Liabilities
2016	(1.2)%
2017	1.9
2018	(2.9)
2019	(0.6)
2020	(1.9)
2021	3.8

Section VI: Required 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 for the 2022/2023 fiscal year and a comparison to the previous valuation results.

Contribution for	2022/2023 Fiscal Year	2021/2022 Fiscal Year
Normal Cost:		
Service retirement benefits	20.87%	19.82%
Disability benefits	0.56	0.87
Survivor benefits	0.97	0.92
Total	22.40%	21.61%
Member Contributions:	7.25%	7.25%
Less future refunds	(0.86)	(1.08)
Available for benefits	6.39%	6.17%
Employer Normal Cost	16.01%	15.44%
Administrative Expense Load	0.28%	0.25%
Unfunded Actuarial Accrued Liabilities (21.0 year level % of payroll amortization*)	32.79%	33.39%
Total Computed Employer Contribution Rate	49.08%	49.08%

* Amortization period a year ago was 21.7 years.

The current funding policy has set the employer contribution rate to 49.08% of payroll and set 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: Required Contribution Rates

The components of the change in the computed unfunded actuarial accrued liability amortization period from 21.7 years to 21.0 years are as follows:

Previously Reported Period	21.7 years
Change due to:	
Normal amortization	(1.0)
Actuarial experience	(0.7)
MVR fee assumption change	0.0
Assumption/Method changes	1.0
Contribution experience	0.0
Computed Period	21.0 years

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, 2021

GROUP	NUMBER
Retired participants and beneficiaries currently receiving benefits	761
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	64
Active Participants	478
Total	1,303

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 remained relatively level 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)
06/30/2012	$268,424	$421,415	63.7%	$152,991	$25,670	596.0%
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

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	**2021**	**2020**
Employer contribution rate		
Normal Cost*	16.29%	15.69%
Accrued liability	24.60	25.93
Total	40.89%	41.62%
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)
6/30/2012	$20,760	$300,753	$99,902	$268,424	100%	82.3%	0.0%
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	121,220	339,114	100	89.2	0.0
6/30/2018	27,581	358,342	141,505	352,415	100	90.6	0.0
6/30/2019	27,244	372,526	142,155	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	130,822	403,748	100	90.8	0.0

As can be seen from the table above, the HSPRS plan assets currently covers 100% of the active member contribution account balances as of the valuation date but only covers about 90.8% 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

Valuation Date	Number of Employers	Active Members: Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2012	1	547	$25,670,030	$46,929	(2.8)%
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)

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

	Fiscal Year Ended June 30									
Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Beginning of Year	704	713	713	720	724	724	726	725	734	740
Added	31	23	28	22	26	22	17	28	21	39
Removed	(22)	(23)	(21)	(18)	(26)	(20)	(18)	(19)	(15)	(18)
End of Year	713	713	720	724	724	726	725	734	740	761

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

Section VII: Supplemental Disclosure Information

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

Year Ending	2015	2016	2017	2018	2019	2020	2021
Beginning of Year	$26,966,360	$28,076,536	$28,782,015	$29,563,842	$30,614,457	$31,814,897	$33,344,108
Added	890,167	833,870	717,225	787,728	1,186,864	1,202,084	2,196,435
Removed	(480,408)	(830,278)	(694,187)	(494,512)	(812,457)	(613,918)	(1,029,029)
Benefit increase due to annual COLA	700,417	701,887	758,789	757,399	826,033	941,045	932,376
Benefit increase due to plan amendments	0	0	0	0	0	0	0
End of Year	$28,076,536	$28,782,015	$29,563,842	$30,614,457	$31,814,897	$33,344,108	$35,443,890

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, 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
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

Section VII: Supplemental Disclosure Information

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, 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
July 1, 2011 to June 30, 2012									
Average Monthly Benefit	$1,648.69		$2,340.93	$982.05	$1,568.62	$2,267.88	$4,335.37	$3,798.92	$3,112.35
Average Final Salary	$39,568.45		$58,021.27	$39,971.01	$28,716.82	$46,824.02	$71,048.35	$62,979.14	$56,306.75
Number of Active Retirants	1		1	1	1	10	5	12	31

Section VIII: Risk Assessment

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 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 actuarially determined contributions.

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. The annual projection report will assess many of the risks listed above.

Schedule A: Development of Actuarial Value of Assets

($ thousands)

	Valuation Date June 30:	2020	2021	2022	2023	2024	2025
A.	Actuarial Value Beginning of Year	$362,591	$373,511				
B.	Market Value End of Year	364,102	463,984				
C.	Market Value Beginning of Year	366,165	364,102				
D.	Cash Flow						
	D1. Contributions	18,853	18,396				
	D2. Other Revenue	3,719	3,544				
	D3. Benefit Payments	(35,455)	(37,433)				
	D4. Refunds	(48)	(66)				
	D5. Administrative Expenses	(328)	(320)				
	D6. Net	(13,259)	(15,879)				
E.	Investment Income						
	E1. Market Total: B.-C.-D6.	11,196	115,761				
	E2. Assumed Rate	7.75%	7.75%				
	E3. Amount for Immediate Recognition	27,864	27,603				
	E4. Amount for Phased-In Recognition	(16,668)	88,158				
F.	Phased-In Recognition of Investment Income						
	F1. Current Year: 0.20*E4.	(3,334)	17,632				
	F2. First Prior Year	(331)	(3,334)	17,632			
	F3. Second Prior Year	365	(331)	(3,334)	17,632		
	F4. Third Prior Year	4,181	365	(331)	(3,334)	17,632	
	F5. Fourth Prior Year	(4,566)	4,181	365	(331)	(3,334)	17,632
	F6. Total Recognized Investment Gain	(3,685)	18,513	14,332	13,967	14,298	17,632
G.	Actuarial Value End of Year: A + D6. + E3. + F6.	$373,511	$403,748				
H.	Difference Between Market & Actuarial Values	$(9,409)	$60,236	$45,904	$31,937	$17,639	$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, 2021 ($ in Thousands)	
	Market Value	**Actuarial Value**
(1) Assets at June 30, 2020	$364,102	$373,511
(2) Contributions and Misc. Revenue	21,940	21,940
(3) Investment Increment	115,761	46,116
(4) Benefit Payments	(37,433)	(37,433)
(5) Refunds	(66)	(66)
(6) Administrative Expenses	(320)	(320)
(7) Assets at June 30, 2021 (1)+(2)+(3)+(4)+(5)+(6)	$463,984	$403,748
(8) Net Investment Return [2 x (3)] / [(7) + (1) – (3)]	32.50%	12.61%

Schedule B: Statement of Actuarial Assumptions & Methods

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: 0.28% 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.

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.

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.

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.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded actuarial accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from the HSPRS. 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, 2021, 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*
7/1/2008	12/31/2011	30.30%	7.25%	
1/1/2012	6/30/2012	35.21	7.25	
7/1/2012	6/30/2018	37.00	7.25	
7/1/2018	6/30/2021	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 $175,665).

Effective July 1, 2021, additional contributions from SB 2659 and HB 1015 are estimated to be $3,700,000 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; 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

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 3% for each year of age below age 55, or 3% for each year of service below 25 years of creditable service, whichever is less.

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 purposed of disability benefits, average annual compensation is calculated using the last two years of salary before retirement.
Duty-Related	If you become permanently disabled due to sickness or injury caused or sustained as a direct result of duty, you may be eligible for duty-related disability retirement. You are covered for this benefit from the first day of employment if you have not reached age 55, regardless of your 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 you are vested, your 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 your 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 your spouse and dependent children regardless of your vesting status. If you are vested, your 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 your 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	518	26	40	578	16	181	1,359
Refunded	(3)	(2)					(5)
Deceased	(1)			(15)	(3)	(7)	(26)
Certain Period End						(1)	(1)
Inactive							
Duplicate*	(24)						(24)
Retired	(12)			12			
For Valuation	478	24	40	575	13	173	1,303

*Also included in Pensioner File

STATUS RECONCILIATION FROM 2020 TO 2021

Reconciliation of Data from Last Year to This Year	Actives	Retirees	Disableds	Survivors	Deferred Vested	Inactives	Total
As of June 30, 2020	511	556	16	168	47	25	1,323
Retirement	(25)	36			(11)		
Disabled							
Death with Survivor	(2)	(11)	(2)	15			
Terminated Def Vested	(10)				12	(2)	
Inactives	(1)				(5)	6	
Return to Active Svc	5				(3)	(2)	
Refunded						(3)	(3)
Death No Survivor	(1)	(6)	(1)	(8)			(16)
Benefit Ended				(2)			(2)
Removed/Cleanup							
New / Pick-up	1						1
As of June 30, 2021	478	575	13	173	40	24	1,303

Schedule D: Detailed Tabulations of the Data

Retirants & Beneficiaries as of June 30, 2021
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
2021	36	$2,086,944	$0	$2,086,944	$4,831
2020	23	1,301,004	19,207	1,320,211	4,783
2019	26	1,172,818	54,262	1,227,080	3,933
2018	16	789,871	58,868	848,739	4,421
2017	18	802,918	80,172	883,090	4,088
2016	12	504,237	68,578	572,815	3,978
2015	15	703,343	120,023	823,366	4,574
2014	21	941,868	184,728	1,126,596	4,471
2013	16	644,831	146,782	791,613	4,123
2012	18	775,830	197,399	973,229	4,506
2011	20	883,693	258,596	1,142,289	4,760
2010	45	1,797,873	607,154	2,405,027	4,454
2009	30	1,259,147	452,050	1,711,198	4,753
2008	14	529,604	212,745	742,349	4,419
2007	20	687,798	279,656	967,454	4,031
2006	18	574,517	266,713	841,230	3,895
2005	20	600,369	289,289	889,658	3,707
2004	18	672,565	365,751	1,038,316	4,807
2003	9	222,489	124,764	347,253	3,215
2002	26	728,649	450,463	1,179,112	3,779
2001	21	611,286	400,281	1,011,567	4,014
2000	13	421,153	294,433	715,586	4,587
1999	14	400,097	299,877	699,975	4,167
1998	29	849,354	666,753	1,516,107	4,357
1997	27	692,352	589,762	1,282,114	3,957
1996	20	496,821	413,527	910,348	3,793
1995	14	356,266	322,825	679,090	4,042
1994	13	298,076	289,638	587,714	3,767
1993	17	344,791	339,597	684,388	3,355
1992	3	53,655	54,386	108,041	3,001
1991	5	69,809	78,634	148,443	2,474
1990	10	143,659	168,765	312,424	2,604
1989	1	20,314	24,653	44,967	3,747
1988	3	33,169	40,974	74,143	2,060
1987	88	1,424,477	1,843,908	3,268,384	3,095
1986	8	109,361	143,372	252,733	2,633
1985	8	108,138	166,950	275,088	2,865
1984 and Prior	46	334,322	620,887	955,209	1,730
TOTAL	761	$24,447,469	$10,996,421	$35,443,890	$3,881

Schedule D: Detailed Tabulations of the Data

Schedule of Retired Members by Type of Retirement

Benefits Payable June 30, 2021

Amount of Original Monthly Benefit	Number of Rets.	Ret Type 1*	Ret Type 2*	Ret Type 3*
$1 – $500	29	2	2	25
501 – 1,000	89	7	3	79
1,001 – 1,500	64	23	1	40
1,501 – 2,000	96	78	5	13
2,001 – 2,500	102	95	1	6
2,501 – 3,000	92	88	1	3
3,001 – 3,500	97	92		5
3,501 – 4,000	57	56		1
4,001 – 4,500	47	46		1
4,501 – 5,000	23	23		
Over 5,000	65	65		
Totals	761	575	13	173

*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, 2021

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	29	25		1						3			
501 – 1,000	89	77		1	1			2	1	8		1	1
1,001 – 1,500	64	39		3				1	3	21	2		6
1,501 – 2,000	96	21		8	2		1	2	3	62	1	1	9
2,001 – 2,500	102	11		8			1	2	1	80	10	3	14
2,501 – 3,000	92	8		9	1		2	3	2	69	5	5	34
3,001 – 3,500	97	13	1	10				1		72	8	5	33
3,501 – 4,000	57	4		1	1		3	2		46	8	4	19
4,001 – 4,500	47	1	1	4			1	2		38	4	6	14
4,501 – 5,000	23			1						22	4		10
Over 5,000	65	1		1						63	6	8	16
Totals	761	200	2	47	5	0	8	15	10	484	48	33	156

<u>Option Selected</u>

Life	-	Return of Contributions
Opt. 1	-	Return 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, 2021

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20					4	$34,292	4	$34,292
20 – 24					1	$12,214	1	$12,214
25 – 29							0	$0
30 – 34					2	$36,489	2	$36,489
35 – 39					4	$55,736	4	$55,736
40 – 44	1	$49,224					1	$49,224
45 – 49	9	$397,575	2	$28,892	5	$114,273	16	$540,740
50 – 54	37	$1,822,370	2	$73,177	4	$91,304	43	$1,986,851
55 – 59	61	$3,207,089	2	$50,966	4	$101,979	67	$3,360,034
60 – 64	117	$6,664,890	1	$33,736	4	$148,339	122	$6,846,965
65 – 69	116	$6,219,149	1	$20,575	13	$367,877	130	$6,607,601
70 – 74	110	$5,808,976	2	$80,391	26	$684,408	138	$6,573,775
75 – 79	62	$3,282,503	1	$23,095	39	$1,122,569	102	$4,428,167
80 – 84	40	$2,072,100	1	$13,232	30	$800,495	71	$2,885,827
85 – 89	15	$794,668	1	$15,050	20	$511,104	36	$1,320,822
90 – 94	6	$283,008			12	$264,048	18	$547,056
95							0	$0
96	1	$65,007			1	$29,739	2	$94,746
97					1	$18,188	1	$18,188
98					1	$16,595	1	$16,595
99					1	$10,610	1	$10,610
100 & Over					1	$17,958	1	$17,958
Totals	575	$30,666,559	13	$339,114	173	$4,438,217	761	$35,443,890

Average Age: 69.4 years
Average Age at Retirement: 50.4 years

Schedule D: Detailed Tabulations of the Data

Total Active Member Data as of June 30, 2021
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		10								10	$ 465,512
25 to 29		49	1							50	2,352,030
30 to 34	1	33	31	2						67	3,316,098
35 to 39		11	28	23	10					72	4,247,379
40 to 44	1	10	15	27	26	10				89	5,519,493
45 to 49		7	2	26	16	41	3			95	6,575,785
50 to 54		3	2	9	6	29	18	2		69	5,165,762
55 to 59				2	1	5	9	4		21	1,777,165
60 to 64						2	2	1		5	361,204
65 to 69											0
70 & Over											0
Total Count	2	123	79	89	59	87	32	7		478	$ 29,780,428

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

Age: 41.7 years
Service: 12.8 years
Annual Pay: $62,302

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 6/30/2021	$ Gain (or Loss) For Year Ending 6/30/2020
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	$ 307.9	$ 121.9
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	29.2	23.4
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	295.3	44.4
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(706.1)	(344.9)
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	2,569.0	(3,254.6)
New Members / Rehires. Additional unfunded actuarial accrued liability will produce a loss.	(16.3)	(101.1)
Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.	17,784.2	(3,408.0)
Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.	2,322.4	(859.4)
Other. Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, etc.	(1,247.6)	(2,482.4)
Gain (or Loss) During Year From Financial Experience	$ 21,338.0	$ (10,260.6)
Non-Recurring Items. Adjustments for plan amendments, software changes, assumption changes, or method changes.	(2,545.6)	0.0
Composite Gain (or Loss) During Year	$ 18,792.4	$ (10,260.6)

Schedule F: Funding Policy

FUNDING POLICY OF THE MHSPRS BOARD OF TRUSTEES

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

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.

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Report on the Annual Valuation of the Supplemental Legislative Retirement Plan of Mississippi

Prepared as of June 30, 2021

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December 8, 2021

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 Supplemental Legislative Retirement Plan of Mississippi. The purpose of the valuation was to measure the Plan's funding progress and to determine the unfunded actuarial accrued liability amortization period beginning July 1, 2021. The results may not be applicable for other purposes.

The date of the valuation was June 30, 2021.

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.

Since the previous valuation, the Board adopted new actuarial assumptions based on the experience investigation for the four-year period ending June 30, 2020. The results of this study were presented to the Board in April, 2021 and the Board adopted the demographic assumption recommendations with regard to the rates of mortality, retirement, and withdrawal and adopted the economic assumption recommendations with regards to the investment return, price inflation, and wage inflation assumptions at its August, 2021 meeting. The complete list of new actuarial assumption changes is shown on page 2 of this report.

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.

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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.

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

In order to prepare the results in this report we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information, but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments that we believe would be appropriate due to the pandemic

This actuarial valuation was performed to determine the adequacy of statutory contributions 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.

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 plan, and on actuarial assumptions that are, in the aggregate, internally consistent and reasonably based on the actual experience of the plan.

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: Summary of Principal Results

1. This report, prepared as of June 30, 2021, presents the results of the annual actuarial valuation of the Plan. 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, 2021. Based on the funding policy adopted by the Board in 2012, the employer contribution rate is to be set at 7.40% of annual compensation and the amortization period calculated on an open basis.

VALUATION DATE	June 30, 2021	June 30, 2020
Investment Return Assumption	**7.55%**	**7.75%**
Active members included in valuation		
Number	173	171
Annual compensation	$ 8,029,670	$ 6,890,817
Retirees		
Number	233	235
Annual allowances	$ 1,596,810	$ 1,565,656
Assets		
Market related actuarial value	$ 19,980,000	$ 18,472,000
Market value	$ 22,950,000	$ 17,995,000
Unfunded actuarial accrued liability (UAAL)	$ 5,422,264	$ 5,012,818
Funded Ratio	78.7%	78.7%
Employer contribution rate		
Normal Cost*	2.85%	2.83%
Accrued liability	4.55	4.57
Total	7.40%	7.40%
Anticipated accrued liability payment period	25.1 years	27.7 years
Unfunded actuarial accrued liability based on Market value of assets	$ 2,452,264	$ 5,489,818
Funded Ratio	90.3%	76.6%
Payment period	8.0 years	33.6 years

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

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

Section I: Summary of Principal Results

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

4. 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, 2021 on an actuarial value of assets basis was 12.64%, compared to the assumed rate of return for the period of 7.75%.

5. Since the previous valuation, various economic and demographic assumptions have been revised. The changes are summarized below and shown in more detail in Schedule B:
   - The expectation of retired life mortality was changed to the PubS.H-2010(B) Retiree Table with the following adjustments:
     - For males, 95% of male rates up to age 60, 110% for ages 61 to 75, and 101% for ages above 77.
     - For females, 84% of female rates up to age 72 scaled up to 100% for ages above 76.
     - Projection scale MP-2020 will be used to project future improvements in life expectancy generationally.
   - The expectation of contingent life mortality was changed to the PubS.H-2010(B) Contingent Annuitant Table with the following adjustments:
     - For males, 97% of male rates for all ages.
     - For females, 110% of female rates for all ages.
     - Projection scale MP-2020 will be used to project future improvements in life expectancy generationally.
   - The expectation of disabled mortality was changed to PubG.H-2010 Disabled Retiree Table for disabled retirees with the following adjustments:
     - For males, 134% of male rates at all ages.
     - For females, 121% of female rates at all ages.
     - Projection scale MP-2020 will be used to project future improvements in life expectancy generationally.
   - The investment rate of return assumption was reduced from 7.75% to 7.55%.
   - The price inflation assumption was reduced from 2.75% to 2.40%.
   - The wage inflation assumption was reduced from 3.00% to 2.65%.
   - Withdrawal rates, pre-retirement mortality rates, and service retirement rates were also adjusted to reflect actual experience more closely.

6. Schedule C gives a summary of the benefit and contribution provisions of the plan. There have been no changes since the previous valuation.

7. 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.

8. 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 funding 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 funding ratio does not have any relationship to measuring the sufficiency if the plan had to settle its liabilities.

9. The table on page 4 provides a ten-year history of some pertinent figures.

Comparative Schedule

	Active Members				Retired Lives				Valuation Results ($ thousands)		
Valuation Date June 30	Number	Payroll ($ in thousands)	Average Salary	% increase from previous year	Number	Active/ Retired Ratio	Annual Benefits ($ thousands)	Benefits as % of Payroll	Accrued Liability	Valuation Assets	UAAL
2012	175	$6,872	$39,267	0.3%	173	1.0	$1,046.7	15.2%	$19,537	$13,268	$6,269
2013	175	6,695	38,259	(2.6)	188	0.9	1,121.4	16.7	19,978	13,554	6,424
2014	175	6,918	39,531	3.3	187	0.9	1,139.5	16.5	20,240	14,899	5,341
2015	174	6,861	39,432	(0.3)	185	0.9	1,133.6	16.5	21,213	16,098	5,115
2016	171	6,862	40,130	1.8	207	0.8	1,277.8	18.6	21,259	16,447	4,812
2017	174	6,928	39,817	(0.8)	205	0.8	1,279.5	18.5	21,849	17,208	4,641
2018	174	6,833	39,270	(1.4)	207	0.8	1,304.5	19.1	22,319	17,945	4,374
2019	170	6,937	40,806	3.9	215	0.8	1,372.9	19.8	22,934	18,428	4,506
2020	171	6,891	40,297	(1.2)	235	0.7	1,565.7	22.7	23,485	18,472	5,013
2021	173	8,030*	46,414	15.2	233	0.7	1,596.8	19.9	25,402	19,980	5,422

* Payroll for the fiscal year ending June 30, 2021 was larger than past years due to a longer Legislative session.

Section II: Membership Data

Data regarding the membership of the Plan for use as a basis for the valuation were furnished by the Plan's office. The following tables summarize the membership of the Plan as of June 30, 2021 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	5	173	$ 8,029,670	$46,414	55.6	9.7

* Eligibility service is 14.8 years.

Of the 173 active members, 117 are vested and 56 are non-vested.

Retired Lives

			Group Averages	
Type of Benefit Payment	No.	Annual Benefits	Benefit	Age
Retirement	186	$1,242,055	$6,678	73.4
Disability	1	8,646	8,646	66.5
Survivor	46	346,109	7,524	74.8
Total in SLRP	233	$1,596,810	$6,853	73.7

Deferred Vested/Inactive Lives

Type of Member	No.	Deferred Benefits	Outstanding Balance
Deferred Vested – Benefit Included	33	$118,061	N/A
Inactive	29	N/A	$171,943
Total in SLRP	62	$118,061	$171,943

For the liability in this valuation, deferred vested participants with benefits provided are valued assuming a retirement age of 60 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 plan as of the current valuation date of June 30, 2021 and, for comparison purposes, as of the immediately preceding valuation date of June 30, 2020. 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
SUPPLEMENTAL LEGISLATIVE RETIREMENT PLAN OF MISSISSIPPI

	JUNE 30, 2021	JUNE 30, 2020
ASSETS		
Current actuarial value of assets:		
Annuity Savings Account	$ 2,331,172	$ 2,145,475
Annuity Reserve	3,943,744	3,923,992
Employers' Accumulation Account	13,705,084	12,402,533
Total current assets	$ 19,980,000	$ 18,472,000
Future member contributions to Annuity Savings Account	$ 1,660,506	$ 1,654,871
Prospective contributions to Employer's Accumulation Account		
Normal contributions	$ 1,422,500	$ 1,423,189
Unfunded actuarial accrued liability contributions	5,422,264	5,012,818
Total prospective contributions	$ 6,844,764	$ 6,436,007
Total assets	$ 28,485,270	$ 26,562,878
LIABILITIES		
Present value of benefits payable on account of present retired members and beneficiaries	$ 16,275,129	$ 16,356,108
Present value of benefits payable on account of inactive members for service rendered before the valuation date	1,331,692	1,227,402
Present value of benefits payable on account of active members	$ 10,878,449	$ 8,979,368
Total liabilities	$ 28,485,270	$ 26,562,878

Section III: Valuation Balance Sheet

BREAKDOWN OF TOTAL AND ACCRUED LIABILITIES
AS OF JUNE 30, 2021

	Total Liability	Accrued Liability
Active Members		
Retirement	$ 8,816,112	$ 6,879,499
Death	525,450	373,695
Disability	263,538	94,304
Termination	1,273,349	447,945
Total	$ 10,878,449	$ 7,795,443
Retirees		
Retirement	$ 13,307,540	$ 13,307,540
Survivor	2,893,319	2,893,319
Disability	74,270	74,270
Total	$ 16,275,129	$ 16,275,129
Deferred Vested Members	987,806	987,806
Inactive Members	343,886	343,886
Total Actuarial Values	$ 28,485,270	$ 25,402,264
Actuarial Value of Assets		19,980,000
Unfunded Actuarial Accrued Liability		$ 5,422,264

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 Plan as of June 30, 2021.

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 plan. 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 $2,331,172. The assets credited to the Annuity Reserve were $3,943,744 and the assets credited to the Employer's Accumulation Account totaled $13,705,084. Current actuarial assets as of the valuation date equaled the sum of these three funds, $19,980,000. Future member contributions to the Annuity Savings Account were valued to be $1,660,506. Prospective contributions to the Employer's Accumulation Account were calculated to be $6,844,764 of which $1,422,500 is attributable to service rendered after the valuation date (normal contributions) and $5,422,264 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 Plan to be $28,485,270 as of June 30, 2021.

Total Liabilities

The present value of benefits payable on account of presently retired members and beneficiaries totaled $16,275,129 as of the valuation date. The present value of future benefit payments on behalf of active members amounted to $10,878,449. In addition, the present value of benefits for inactive members, due to service rendered before the valuation date, was calculated to be $1,331,692.

Therefore, the balance sheet shows the present value for all prospective benefit payments under the Plan to be $28,485,270 as of June 30, 2021.

Section 25-11-307(1) of State law requires that active members contribute 3.00% of annual compensation to the Plan.

Section 25-11-307(2) 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 Plan. These individual contribution percentages are established in accordance with an actuarial valuation. Based on the funding policy adopted by the Board in October 2012, the employer rate is set at 7.40% of annual compensation and the amortization period calculated on an open basis. Therefore, the amortization period for the June 30, 2021 valuation is 25.1 years, compared to 27.7 years for the previous valuation.

The primary reason for the decrease in the amortization period is the economic and demographic experience of the System, offset by the actuarial assumption changes. 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) coincide 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. Detail on the derivation of the experience gain/(loss) for the years ended June 30, 2021 and June 30, 2020 is shown below.

		2021 Valuation $ Thousands	2020 Valuation $ Thousands
(1)	UAAL* as of beginning of year	$ 5,012.8	$ 4,505.9
(2)	Total normal cost from last valuation	413.8	421.2
(3)	Total contributions	849.0	719.0
(4)	Interest accrual: [[(1) + (2)] x .0775] - [(3) x .03875]	387.7	353.9
(5)	Expected UAAL before changes: (1) + (2) – (3) + (4)	$ 4,965.3	$ 4,562.0
(6)	Change due to plan amendments	0.0	0.0
(7)	Change due to actuarial assumptions or methods	364.7	0.0
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 5,330.0	$ 4,562.0
(9)	Actual UAAL as of end of year	$ 5,422.3	$ 5,012.8
(10)	Gain/(loss): (8) – (9)	$ (92.3)	$ (450.8)
(11)	Gain/(loss) as percent of actuarial accrued liabilities at start of year.	(0.4)%	(2.0)%

*Unfunded actuarial accrued liability.

Valuation Date June 30	Actuarial Gain/(Loss) as a % of Beginning Accrued Liabilities
2016	1.7%
2017	1.9
2018	1.4
2019	(0.2)
2020	(2.0)
2021	(0.4)

Section VI: Required Contribution Rates

The valuation balance sheet gives the basis for determining the percentage rates for contributions to be made by employers to the Retirement Plan. The following table shows the rates of contribution payable by employers as determined from the present valuation for the 2022/2023 fiscal year and a comparison to the previous valuation results.

Contribution for	2022/2023 Fiscal Year	2021/2022 Fiscal Year
Normal Cost:		
Service retirement benefits	4.12%	4.25%
Disability benefits	0.25	0.27
Survivor benefits	0.25	0.30
Total	4.62%	4.82%
Member Contributions:	3.00%	3.00%
Less future refunds	(0.95)	(0.76)
Available for benefits	2.05%	2.24%
Employer Normal Cost	2.57%	2.58%
Administrative Expense Load	0.28%	0.25%
Unfunded Actuarial Accrued Liabilities (25.1 year level % of payroll amortization*)	4.55%	4.57%
Total Statutory Employer Contribution Rate	7.40%	7.40%

*Amortization period a year ago was 27.7 years.

The current funding policy has set the employer contribution rate to 7.40% of payroll and set 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: Required Contribution Rates

The components of the change in the computed unfunded actuarial accrued liability amortization period from 27.7 years to 25.1 years are as follows:

Previously Reported Period	27.7 years
Change due to:	
Normal amortization	(1.0)
Actuarial experience	(6.0)
Assumption changes	5.1
Plan amendments	0.0
Contribution experience	(0.7)
Computed Period	25.1 years

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, 2021

GROUP	NUMBER
Retired participants and beneficiaries currently receiving benefits	233
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	62
Active Participants	173
Total	468

Section VII: Supplemental Disclosure Information

2. Another such item is the schedule of funding progress as shown below. As can be seen in column 3 of the table below, the funded ratio remained level this year and remains at a healthy level. In addition, the UAAL as a percentage of payroll, shown in column 6, has decreased this valuation after increasing the past two years.

SCHEDULE OF FUNDING PROGRESS

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)
06/30/2012	$13,268,000	$19,536,604	67.9%	$6,268,604	$6,871,757	91.2%
06/30/2013#	13,554,000	19,977,584	67.8	6,423,584	6,695,359	95.9
06/30/2014	14,899,000	20,239,757	73.6	5,340,757	6,917,939	77.2
06/30/2015#	16,098,000	21,213,446	75.9	5,115,446	6,861,166	74.6
06/30/2016	16,447,000	21,258,800	77.4	4,811,800	6,862,262	70.1
06/30/2017#	17,208,000	21,848,868	78.8	4,640,868	6,928,085	67.0
06/30/2018	17,945,000	22,318,685	80.4	4,373,685	6,832,961	64.0
06/30/2019#	18,428,000	22,933,853	80.4	4,505,853	6,937,075	65.0
06/30/2020	18,472,000	23,484,818	78.7	5,012,818	6,890,817	72.7
06/30/2021#	19,980,000	25,402,264	78.7	5,422,264	8,029,670	67.5

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	**2021**	**2020**
Employer contribution rate		
Normal Cost*	2.85%	2.83%
Accrued liability	4.17	4.39
Total	7.02%	7.22%
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)

Valuation Date	Actuarial Accrued Liabilities for: (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	Portions of Accrued Liabilities Covered by Assets: (1)	(2)	(3)
6/30/2012	$2,105	$11,428	$6,004	$13,268	100%	97.7%	0.0%
6/30/2013	2,416	11,909	5,652	13,554	100	93.5	0.0
6/30/2014	2,638	11,920	5,682	14,899	100	100.0	6.0
6/30/2015	2,862	12,329	6,023	16,098	100	100.0	15.1
6/30/2016	2,485	13,758	5,016	16,447	100	100.0	4.1
6/30/2017	2,636	13,799	5,414	17,208	100	100.0	14.3
6/30/2018	2,693	13,840	5,786	17,945	100	100.0	24.4
6/30/2019	2,701	14,282	5,951	18,428	100	100.0	24.3
6/30/2020	2,145	16,356	4,984	18,472	100	99.8	0.0
6/30/2021	2,331	16,275	6,796	19,980	100	100.0	20.2

As can be seen from the table above, the SLRP plan assets currently covers 100% of the active member contribution account balances and 100% of the retiree liability as of the valuation date. However, the remaining assets only cover a small percentage of the employer financed active liabilities.

Section VII: Supplemental Disclosure Information

Schedule of Active Member Valuation Data

Valuation Date	Number of Employers	Active Members			
		Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
2012	5	175	$6,871,757	$39,267	0.3%
2013	5	175	6,695,359	38,259	(2.6)
2014	5	175	6,917,939	39,531	3.3
2015	5	174	6,861,166	39,432	(0.3)
2016	5	171	6,862,262	40,130	1.8
2017	5	174	6,928,085	39,817	(0.8)
2018	5	174	6,832,961	39,270	(1.4)
2019	5	170	6,937,075	40,806	3.9
2020	5	171	6,890,817	40,297	(1.2)
2021	5	173	8,029,670	46,414	15.2

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

Item	Fiscal Year Ended June 30									
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Beginning of Year	147	173	188	187	185	207	205	207	215	235
Added	33	20	6	8	28	6	6	11	25	3
Removed	(7)	(5)	(7)	(10)	(6)	(8)	(4)	(3)	(5)	(5)
End of Year	173	188	187	185	207	205	207	215	235	233

*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	2015	2016	2017	2018	2019	2020	2021
Beginning of Year	$1,139,477	$1,133,588	$1,277,763	$1,279,471	$1,304,548	$1,372,878	$1,565,656
Added	58,303	177,207	31,300	34,983	72,406	216,379	14,393
Removed	(95,910)	(57,546)	(64,321)	(42,480)	(43,651)	(64,124)	(26,951)
Benefit increase due to annual COLA	31,718	24,514	34,729	32,574	39,575	40,523	43,712
Benefit increase due to plan amendments	0	0	0	0	0	0	0
End of Year	$1,133,588	$1,277,763	$1,279,471	$1,304,548	$1,372,878	$1,565,656	$1,596,810

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, 2020 to June 30, 2021									
Average Monthly Benefit	$192.21					$815.03			$399.82
Average Final Salary	$32,588.76					$44,865.25			$36,680.92
Number of Active Retirants	2					1			3
July 1, 2019 to June 30, 2020									
Average Monthly Benefit	$244.53	$334.26	$551.15	$799.36		$969.20		$713.07	$657.06
Average Final Salary	$36,523.16	$40,009.26	$32,107.39	$39,043.63		$34,675.32		$42,094.84	$37,017.34
Number of Active Retirants	3	2	5	7		4		3	24
July 1, 2018 to June 30, 2019									
Average Monthly Benefit	$169.43	$372.79	$636.97	$742.14		$738.58		$960.08	$548.53
Average Final Salary	$24,872.76	$42,782.28	$42,042.72	$42,479.52		$40,654.56		$44,126.04	$38,076.62
Number of Active Retirants	3	2	1	2		1		2	11
July 1, 2017 to June 30, 2018									
Average Monthly Benefit	$33.20		$538.18	$512.85				$1,284.96	$485.87
Average Final Salary	$20,839.50		$40,100.76	$41,549.28				$41,618.04	$27,732.60
Number of Active Retirants	2		1	2				1	6
July 1, 2016 to June 30, 2017									
Average Monthly Benefit	$180.95		$609.42	$452.29	$732.45				$434.72
Average Final Salary	$29,821.02		$37,791.24	$28,377.72	$40,932.00				$32,520.12
Number of Active Retirants	2		1	2	1				6

Section VII: Supplemental Disclosure Information

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, 2015 to June 30, 2016									
Average Monthly Benefit	$249.59	$349.70	$486.61	$654.27	$522.12			$1,200.33	$527.40
Average Final Salary	$36,599.58	$39,877.51	$35,210.67	$39,774.39	$41,482.12			$42,237.92	$38,850.14
Number of Active Retirants	6	6	4	7	2			3	28
July 1, 2014 to June 30, 2015									
Average Monthly Benefit	$163.64	$739.53	$720.77		$578.67			$1,032.05	$607.33
Average Final Salary	$18,636.25	$68,228.41	$37,911.50		$34,790.50			$42,949.00	$40,911.48
Number of Active Retirants	2	2	2		1			1	8
July 1, 2013 to June 30, 2014									
Average Monthly Benefit		$345.04	$490.81	$472.60		$579.73			$454.01
Average Final Salary		$34,404.37	$34,871.00	$39,300.75		$43,164.50			$36,836.00
Number of Active Retirants		2	2	1		1			6
July 1, 2012 to June 30, 2013									
Average Monthly Benefit	$168.36	$182.74	$462.84	$550.22		$730.99			$320.75
Average Final Salary	$27,924.79	$29,576.45	$36,139.50	$39,580.94		$38,727.25			$32,325.08
Number of Active Retirants	6	7	1	4		2			20
July 1, 2011 to June 30, 2012									
Average Monthly Benefit	$193.84	$404.90	$429.73	$675.67		$731.32		$1,237.30	$582.26
Average Final Salary	$33,827.49	$43,765.24	$36,045.25	$38,900.81		$38,644.58		$57,275.51	$41,862.66
Number of Active Retirants	10	6	3	4		3		7	33

Section VIII: Risk Assessment

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 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 actuarially determined contributions.

Annual actuarial valuations are performed for SLRP 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. SLRP 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. The annual projection report will assess many of the risks listed above.

Schedule A: Development of Actuarial Value of Assets

($ thousands)

	Valuation Date June 30:	2020	2021	2022	2023	2024	2025
A.	Actuarial Value Beginning of Year	$18,428	$18,472				
B.	Market Value End of Year	17,995	22,950				
C.	Market Value Beginning of Year	18,609	17,995				
D.	Cash Flow						
	D1. Contributions	719	849				
	D2. Other Revenue	0	0				
	D3. Benefit Payments	(1,858)	(1,608)				
	D4. Refunds	(19)	(6)				
	D5. Administrative Expenses	(10)	(12)				
	D6. Net	(1,168)	(777)				
E.	Investment Income						
	E1. Market Total: B.-C.-D6.	554	5,732				
	E2. Assumed Rate	7.75%	7.75%				
	E3. Amount for Immediate Recognition	1,397	1,365				
	E4. Amount for Phased-In Recognition	(843)	4,367				
F.	Phased-In Recognition of Investment Income						
	F1. Current Year: 0.20*E4.	(169)	873				
	F2. First Prior Year	(17)	(169)	873			
	F3. Second Prior Year	19	(17)	(169)	873		
	F4. Third Prior Year	214	19	(17)	(169)	873	
	F5. Fourth Prior Year	(232)	214	19	(17)	(169)	873
	F6. Total Recognized Investment Gain	(185)	920	706	687	704	873
G.	Actuarial Value End of Year: A. + D6. + E3. + F6.	$18,472	$19,980				
H.	Difference Between Market & Actuarial Values	$(477)	$2,970	$2,264	$1,577	$873	$0

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, 2021 ($ in Thousands)	
	Market Value	**Actuarial Value**
(1) Assets as of June 30, 2020	$17,995	$18,472
(2) Contributions and Misc. Revenue	849	849
(3) Investment Increment	5,732	2,285
(4) Benefit Payments	(1,608)	(1,608)
(5) Refunds	(6)	(6)
(6) Administrative Expenses	(12)	(12)
(7) Adjustment	0	0
(8) Assets as of June 30, 2021 (1)+(2)+(3)+(4)+(5)+(6)+(7)	$22,950	$19,980
(9) Net Investment Return [2 x (3)] / [(7) + (1) – (3)]	32.56%	12.64%

Schedule B: Statement of Actuarial Assumptions & Methods

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 rates of separation from active service are as follows:

	Annual Rate of		
	Death*		
Age	Male	Female	Disability**
20	0.0483%	0.0126%	0.04%
25	0.0567	0.0189	0.05
30	0.0630	0.0259	0.07
35	0.0714	0.0350	0.11
40	0.0893	0.0483	0.17
45	0.1218	0.0665	0.23
50	0.1764	0.0917	0.30
55	0.2594	0.1274	0.35
60	0.3980	0.1757	0.40
65	0.6353	0.2429	0.00
70	1.1655	0.4739	0.00
75	2.1389	0.9247	0.00

* Adjusted Base rates.
** 93% are presumed to be non-duty related, and 7% are assumed to be duty related.

WITHDRAWAL AND VESTING: 15% in an election year, 2% in a non-election year.

SERVICE RETIREMENT: 30% in an election year, 2.5% in a non-election year. All members are assumed to retire no later than age 80.

It is assumed that a member will be granted 2.5 years of service credit for unused leave at termination of employment.

SALARY INCREASES: 2.65% per annum, for all ages.

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

Schedule B: Statement of Actuarial Assumptions & Methods

PAYROLL GROWTH: 2.65% per annum, compounded annually.

ADMINISTRATIVE EXPENSES: 0.28% of payroll.

TIMING OF DECREMENTS AND PAY INCREASES: Middle of Year.

ASSUMED INTEREST RATE ON EMPLOYEE CONTRIBUTIONS: 2.00%

MARRIAGE ASSUMPTION: 85% married with the husband three years older than his wife.

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.

MAXIMUM COVERED EARNINGS ASSUMPTION GROWTH: 2.65%

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

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 SLRP are determined following a level funding approach and consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded actuarial accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from the SLRP. 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 Plan in effect June 30, 2021 as interpreted in preparing the actuarial valuation.

DEFINITIONS

Average Compensation	Average annual covered earnings of an employee during the four highest years of service. To determine your four highest years, PERS considers these scenarios: • Four highest fiscal years of earned compensation; • Four highest calendar years of earned compensation; • Combination of four highest fiscal and calendar years of earned compensation that do not overlap; or • Final 48 months of earned compensation prior to termination of employment.
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.
Eligibility Service	Service while a contributing member of PERS plus additional service as described below. (OLD: Eligibility service" is all service in PERS, including that credited for SLRP service.)
Credited Service	Service while a contributing member of SLRP plus additional service as described below. (OLD: "Creditable service" includes only SLRP service.)
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 the Average Compensation definition.
Additional Service	Additional service credit may be granted for service prior to July 1, 1989, including active duty military service.
Attribution	Attribution period for the normal cost is based on entry into PERS even for members who first participated in SLRP at a later age than PERS.

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
7/1/2009	12/31/2011	6.65	3.00	$245,000
1/1/2012	6/30/2012	7.40	3.00	$245,000
7/1/2012	6/30/2013	7.40	3.00	$250,000
7/1/2013	6/30/2014	7.40	3.00	$255,000
7/1/2014	6/30/2015	7.40	3.00	$260,000
7/1/2015	6/30/2017	7.40	3.00	$265,000
7/1/2017	6/30/2018	7.40	3.00	$270,000
7/1/2018	6/30/2019	7.40	3.00	$275,000
7/1/2019	6/30/2020	7.40	3.00	$280,000
7/1/2020	6/30/2021	7.40	3.00	$285,000

Schedule C: Summary of Main Benefit & Contribution Provisions

BENEFITS

Superannuation Retirement

Condition for Retirement

(a) A retirement allowance is paid upon the request of any member who retires and has attained age 60 and completed at least eight years* of membership service under PERS. A retirement allowance may also be paid upon the completion of at least 25 years of creditable service under PERS for members hired prior to July 1, 2011, or upon the completion of 30 years of creditable service for members hired on or after July 1, 2011.

(b) Any member who withdraws from service prior to his or her attainment of age 60 and who has completed at least eight years* of ,membership service under PERS is entitled to receive, in lieu of a refund of his or her accumulated contributions, a retirement allowance commencing at age 60.

Amount of Allowance

The annual retirement allowance payable to a member who retires under condition (a) above 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 1% of his or her average compensation for each of the first 25 years of creditable service plus 1.25% for each year of creditable service over 25 years.

The minimum allowance is $60 per year of creditable service.

Disability Retirement

Condition for Retirement

A retirement allowance is paid to a member who is totally and permanently disabled, as determined by the Board of Trustees, and has accumulated eight or more years* of membership service under PERS.

* four years for those who entered PERS before July 1, 2007.

Amount of Allowance

For those who were active members prior to July 1, 1992, and did not elect the benefit structure outlined below, the annual disability retirement allowance payable is equal to a superannuation retirement allowance if the member has attained age 60, otherwise it is equal to a superannuation retirement allowance calculated as follows:

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

2. An employer's annuity equal to the amount that would have been payable had the member continued in service to age 60.

For those who become active members after June 30, 1992, and for those who were active members prior to July 1, 1992, who so elected, the following benefits are payable:

1. A temporary allowance equal to the greater of (a) 20% of average compensation plus 5% for each dependent child up to a maximum of 2, or (b) the member's accrued allowance. This temporary allowance is paid for a period of time based on the member's age at disability, as follows:

Age at Disability	Duration
60 and earlier	to age 65
61	to age 66
62	to age 66
63	to age 67
64	to age 67
65	to age 68
66	to age 68
67	to age 69
68	to age 70
69 and later	one year

The minimum allowance is $60 per year of service credit.

2. A deferred allowance commencing when the temporary allowance ceases equal to the greater of (a) the allowance the member would have received based on service to the termination age of the temporary allowance, but not more than 20% of average compensation, or (b) the member's accrued allowance.

The minimum allowance is $60 per year of service credit.

Effective July 1, 2004, a temporary benefit can be paid out of a member's accumulated contribution balance while the member is awaiting a determination for eligibility for disability benefits. Future disability payments, if any, would be offset by advanced payments made from the member's accumulated contributions.

Accidental Disability Retirement

Condition for Retirement

A retirement allowance is paid to a member who is totally and permanently disabled in the line of performance of duty.

Amount of Allowance

The annual accidental disability retirement allowance is equal to the allowance payable on disability retirement but not less than 25% of average compensation. There is no minimum benefit.

Accidental Death Benefit

Condition for Benefit

A retirement allowance is paid to a spouse and/or dependent children upon the death of an active member in the line of performance of duty.

Amount of Allowance

The annual retirement allowance is equal to 25% of average compensation payable to the spouse and 12-1/2% of average compensation payable to one dependent child or 25% to two or more children until age 19 (23 if a full time student). There is no minimum benefit.

Ordinary Death Benefit

Condition for Benefit

Upon the death of a member who has completed at least eight years* of membership service, a benefit is payable, in lieu of a refund of the member's accumulated contributions, to his or her spouse, if said spouse has been married to the member for not less than one year.

* four years for those who entered the system before July 1, 2007.

Amount of Allowance

The annual retirement allowance payable to the lawful spouse of a vested member who dies is equal to the greater of (i) the allowance that would have been payable had the member retired and elected Option 2, reduced by an actuarially determined factor based on the number of years the member lacked in qualifying for unreduced benefits, or (ii) a lifetime benefit equal to 20% of the deceased member's average compensation, but not less than $25 per month.

In addition, a benefit is payable to dependent children until age 19 (23 if a full time student). The benefit is equal to the greater of 5% of average compensation or $25 per month for each dependent child up to 3.

Return of Contributions

Upon the withdrawal of a member without a retirement benefit, his or her contributions are returned to him or her, together with accumulated regular interest thereon.

Upon the death of a member before retirement, his or her contributions, together with the full accumulated regular interest thereon, are paid to his or her designated beneficiary, if any, otherwise, to his or her estate provided no other survivor benefits are payable.

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

The normal form of benefit is an allowance payable during the life of the member with the provision that upon his or her death the excess of his or her total contributions at the time of retirement over the total retirement annuity paid to him or her will be paid to his or her designated beneficiary.

Optional Benefits

A member upon retirement may elect to receive his or her 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 SLRP 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.

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 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 at retirement.

A member who has at least 28 years of creditable service* under PERS can 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 the partial lump-sum 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.

*or at least age 63 with four years of membership service for those who entered PERS before July 1, 2007.

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 55, plus (b) 3% compounded for each year thereafter beginning with the fiscal year in which the member turns age 55.

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.

CONTRIBUTIONS

Members currently contribute 3.00% of covered earnings. The employer contributes 7.40% of covered earnings.

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	Inactive	Deferred Vested	Retirees	Disableds	Survivors	
From PERS	178	29	33	193	1	48	482
Refunded	(1)						(1)
Deceased				(8)		(2)	(10)
Certain Period End							
Inactive							
Duplicate*	(3)						(3)
Retired	(1)			1			
For Valuation	173	29	33	186	1	46	468

*Also included in Pensioner File

STATUS RECONCILIATION FROM 2020 TO 2021

	Actives	Retirees	Disableds	Survivors	Deferred Vested	Inactive	Total
As of June 30, 2020	171	191	1	43	29	33	468
Retirement	(1)	3			(2)		
Disabled							
Death with Survivor		(5)		5			
Terminated Def Vest	(1)				10	(9)	
Terminated NonVest	(2)				(4)	6	
Rehired							
Refunded						(1)	(1)
Death No Survivor		(3)		(2)			(5)
Benefit Ended							
Removed/Cleanup							
New	6						6
As of June 30, 2021	173	186	1	46	33	29	468

Schedule D: Detailed Tabulations of the Data

Retirants & Beneficiaries as of June 30, 2021

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
2021	5	$27,933	$0	$27,933	$466
2020	26	210,112	3,932	214,044	686
2019	7	41,467	1,469	42,936	511
2018	6	30,647	2,365	33,012	459
2017	7	37,149	3,992	41,141	490
2016	23	152,794	18,936	171,730	622
2015	4	35,146	5,644	40,790	850
2014	5	21,980	4,718	26,698	445
2013	16	62,958	14,422	77,380	403
2012	29	179,630	46,735	226,365	650
2011	3	5,193	1,686	6,879	191
2010	4	18,656	6,367	25,023	521
2009	5	25,467	9,785	35,252	588
2008	15	67,656	28,401	96,057	534
2007	1	4,417	2,070	6,487	541
2006	6	21,944	11,505	33,449	465
2005	5	15,970	8,803	24,773	413
2004	16	77,865	47,782	125,647	654
2003	0	0	0	0	0
2002	3	9,092	6,057	15,149	421
2001	8	23,099	17,987	41,086	428
2000	9	40,042	31,651	71,693	664
1999	5	25,692	21,744	47,436	791
1998	2	4,590	3,951	8,541	356
1997	3	9,560	8,728	18,288	508
1996	4	8,061	8,325	16,386	341
1995	1	1,058	1,158	2,216	185
1994	0	0	0	0	0
1993	6	19,383	22,597	41,980	583
1992	8	32,308	40,784	73,092	761
1991	0	0	0	0	0
1990	1	2,203	3,144	5,347	446
TOTAL	233	$1,212,072	$384,738	$1,596,810	$571

Schedule D: Detailed Tabulations of the Data

Schedule of Retired Members by Type of Retirement

Benefits Payable June 30, 2021

Amount of Original Monthly Benefit	Number of Rets.	Ret Type 1*	Ret Type 2*	Ret Type 3*
$1 – $100	15	14		1
101 – 200	33	28		5
201 – 300	38	34		4
301 – 400	46	34		12
401 – 500	28	17	1	10
501 – 600	15	8		7
601 – 700	19	17		2
701 – 800	11	9		2
801 – 900	9	8		1
901 – 1,000	8	8		
Over 1,000	11	9		2
Totals	233	186	1	46

<u>*Type of Retirement</u>
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, 2021

Amount of Original Monthly Benefit	Number of Rets.	Life	Option 1	Option 2	Option 3	Option 4	Option 4A	Option 4B	Option 4C*	PLSO* 1 Year	PLSO* 2 Years	PLSO* 3 Years
$1 – $100	15	6		6				3	1			1
101 – 200	33	14	1	16		1		1				5
201 – 300	38	15	1	14	2	1	3	2		1		2
301 – 400	46	24	1	11			3	7		2		8
401 – 500	28	13	1	8	2		1	3		1	2	6
501 – 600	15	5		4	3		1	2			1	6
601 – 700	19	9		8			1	1			2	2
701 – 800	11	5		5		1				1	1	2
801 – 900	9	5		2		1	1					3
901 – 1,000	8	2	1	3				2			1	2
Over 1,000	11	6		2		1	1	1		2	1	3
Totals	233	104	5	79	7	5	11	22	1	7	8	40

<u>Option Selected</u>

Life	-	Return of Contributions
Opt. 1	-	Return 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. 5	-	Pop-Up
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, 2021

Attained Age	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20								
20 – 24								
25 – 29								
30 – 34								
35 – 39								
40 – 44								
45 – 49								
50 – 54	1	$9,072			4	$27,537	5	$36,609
55 – 59	8	$65,895			3	$30,505	11	$96,400
60 – 64	17	$92,126			3	$27,209	20	$119,335
65 – 69	43	$273,049	1	$8,646	3	$17,781	47	$299,476
70 – 74	43	$281,726			8	$58,658	51	$340,384
75 – 79	34	$236,228			8	$68,211	42	$304,439
80 – 84	23	$146,276			8	$50,461	31	$196,737
85 – 89	12	$91,086			7	$52,537	19	$143,623
90 – 94	4	$38,301			2	$13,210	6	$51,511
95								
96								
97								
98								
99								
100 & Over	1	$8,296					1	$8,296
Totals	186	$1,242,055	1	$8,646	46	$346,109	233	$1,596,810

Average Age: 73.7 years

Average Age at Retirement: 61.9 years

Schedule D: Detailed Tabulations of the Data

Total Active Member Data as of June 30, 2021
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											$ -
25 to 29		2	1							3	136,908
30 to 34		3	2							5	225,152
35 to 39		4	2							6	264,676
40 to 44	2	12	8	2	1					25	1,103,895
45 to 49		7	9	1	2	1				20	927,326
50 to 54	1	4	16	4						25	1,140,852
55 to 59	1	8	15	2	2	2				30	1,442,726
60 to 64	1	4	7	3	3	1	2			21	980,825
65 to 69	1	1	5	1	2		2		2	14	648,981
70 & Over		3	3	6	2		6		4	24	1,158,329
Total Count	6	48	68	19	12	4	10		6	173	$ 8,029,670

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

Age:	55.6 years
Benefit Service:	9.7 years
Eligibility Service:	14.8 years
Annual Pay:	$46,414

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 6/30/2021	$ Gain (or Loss) For Year Ending 6/30/2020
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	$ 10.3	$ 117.0
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	12.8	13.3
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	10.6	12.1
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(186.5)	42.1
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(846.9)	66.5
New Members. Additional unfunded actuarial accrued liability will produce a loss.	(65.1)	(360.4)
Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.	884.0	(171.0)
Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.	63.1	(47.1)
Other. Miscellaneous gains and losses resulting from data adjustments, timing of financial transactions, etc.	25.4	(123.3)
Gain (or Loss) During Year From Financial Experience	$ (92.3)	$ (450.8)
Non-Recurring Items. Adjustments for plan amendments, software changes, assumption changes, or method changes.	(364.7)	0.0
Composite Gain (or Loss) During Year	$ (457.0)	$ (450.8)

Schedule F: Funding Policy of the SLRP Board of Trustees

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. The policy refers to pension benefits and does not address retiree healthcare benefits that may be provided under statute in the future. In addition to periodic reviews of this policy, the Board will amend the policy if retiree healthcare benefits become payable.

I. Funding Goals

The objective in requiring employer and member contributions to the System 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 projected funded ratio is less than 75 percent in 2042, a contribution rate increase will be determined that is sufficient to generate a funded ratio of 85 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 rates for the Supplemental Legislative Retirement Plan (SLRP) set under this policy as revised October 23, 2012, was 7.40 percent of active member payroll effective July 1, 2013.
- **Unfunded Actuarial Accrued Liability (UAAL) amortization period** – The amortization period for the System's UAAL should be declining over time.

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.

The actuarial assumptions used will be those last adopted by the 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 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.

Cavanaugh Macdonald
CONSULTING, LLC

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PERS
of MISSISSIPPI

Report on Thirty-Year Projections of the Mississippi Highway Safety Patrol Retirement System (HSPRS) and Supplemental Legislative Retirement System (SLRP)

Prepared as of June 30, 2021

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

December 8, 2021

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 30-year projections of the Mississippi Highway Safety Patrol Retirement System (HSPRS) and the Mississippi Supplemental Legislative Retirement Plan (SLRP). The purpose of the projection study is to develop a forecast of the Systems' funding progress over time, to review the funding goals and benchmarks outlined in the funding policies that were adopted by the Board of Trustees and provide the status of the metrics/targets in the funding policies that determines whether or not a contribution rate increase should be recommended.

The projections are based on the June 30, 2021 actuarial valuations of HSPRS and SLRP. Membership was projected over a 30-year period from that date and actuarial valuations were performed annually for each of the 30 years to measure the Systems' funding progress. In order to prepare the results in this report, we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

The Executive Summary provides a summary of the main projection results. We certify that we are members of the American Academy of Actuaries and that we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

Respectfully submitted,

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

Ben Mobley, ASA, FCA, MAAA
Consulting Actuary

EJK/BM:mjn

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Table of Contents

Section I - Executive Summary

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 (13^{th} 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.

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.
July 1, 1992	• Provided benefits to dependent children to age 23 if they remain in school.

Section I - Executive Summary

Fiscal Year Beginning	Benefit Modifications
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 unreduced retirement benefit to select a partial lump-sum option at retirement. • Allowed the Cost of Living Adjustment to be calculated on all 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.
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.

Section I - Executive Summary

Fiscal Year Beginning	Benefit Modifications
	• 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.

Section I - Executive Summary

History of Contributions

HSPRS

In 2012, the Board adopted a Fixed Contribution Rate approach, and the employer contribution remained level at 37.00% of annual compensation for several years. But the amortization period to pay off the Unfunded Accrued Liability was increasing each year and in 2018, the Board chose to increase the employer contribution rate to 49.08% of annual compensation effective July 1, 2018.

The employee contribution rate has remained at 7.25% for many years.

SLRP

In 2012, the Board adopted a Fixed Contribution Rate approach, and the employer contribution has remained level at 7.40% of annual compensation since.

The employee contribution rate has also remained at 3.00% for many years.

History of Investment Experience

The assets for all Systems under PERS are commingled and invested similarly. Since 1986, PERS' assets have experienced better than assumed investment returns overall. As you can see from the table below, for the period ending June 30, 2021, the annualized returns for each rolling period is above the current assumption of 7.55%. The historical rolling returns are as follows (these returns are gross returns):

Period Ending June 30	10-Year Annualized Rate of Return	20-Year Annualized Rate of Return	25-Year Annualized Rate of Return	30-Year Annualized Rate of Return
2018	7.4%	6.2%	7.8%	8.5%
2019	10.5	6.0	8.1	8.3
2020	9.4	5.8	7.5	8.0
2021	10.1	7.7	8.1	8.7

Section I - Executive Summary

The following report is being provided to the Board of Trustees of the Highway Safety Patrol Retirement System and the Supplemental Legislative Retirement Plan of Mississippi to develop a forecast of the Systems' funding progress over time, to review the funding goals and benchmarks outlined in the funding policies that were adopted by the Board of Trustees and provide the status of the metrics/targets in the funding policies that determines whether or not a contribution rate increase should be recommended.

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.

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.

- **Unfunded Actuarial Accrued Liability (UAAL) amortization period** – The amortization period for the System's UAAL should be declining over time.

For HSPRS, the employer contribution rate as a percentage of annual compensation was increased from 37.00% to 49.08% as of July 1, 2018. The funding policy still reads that if the projected funded ratio is less than 60% in 2042 or less than 70% following three consecutive projection reports, a contribution rate increase will be determined that is sufficient to generate a funded ratio of 90% in 2042. If a funded ratio of 100% or more is attained and is projected to remain above 100% for the ensuing 30 years following three consecutive annual projection reports, a reduced contribution pattern will be established provided the funded ratio remains at or above 100% in every future year. Please note that the projections for HSPRS include additional contributions estimated at $3.7 million to be made in perpetuity due to Senate Bill No. 2659 (enacted in 2004) and House Bill No. 1015 (enacted in 2013).

For SLRP, if the projected funded ratio is less than 60% in 2042 or less than 75% following two consecutive projection reports, a contribution rate increase will be determined that is sufficient to generate a funded ratio of 85% in 2042. If a funded ratio of 100% or more is attained and is projected to remain above 100% for the ensuing 30 years following two consecutive annual projection reports, a reduced contribution pattern will be established provided the funded ratio remains at or above 100% in every future year.

Section I - Executive Summary

The results of the 30-year projections for each of the HSPRS and SLRP plans are shown in the next 5 sections of the report.

Regular actuarial valuations measure the Systems present financial position and contribution adequacy by calculating and financing the liabilities created by the present benefit program. This process involves discounting to present values the future benefit payments on behalf of present active and retired members and their survivors. However, valuations do not produce information regarding future changes in the makeup of the covered group or the amounts of benefits to be paid or investment income to be received – actuarial projections do provide this information.

Whereas valuations provide a snapshot of the System as of a given date, projections provide a moving forecast. Projected active and retired groups are developed from year to year by the application of assumptions regarding pre-retirement withdrawal from service, retirements, deaths, disabilities, and the addition of new members. Projected information regarding the retired life group leads to assumed future benefit payouts. Performing actuarial valuations every year during the projection period generates expected contribution rates and unfunded accrued liability (UAL) amortization periods. Combining future benefit payments with assumed contributions based on periodic valuations of the projected membership and expected investment earnings produces the net cash flow of the System each year, and thus end of year asset levels. Finally, the valuation results permit the development of the funded ratio trend line for the entire projection period.

Projections are used for many purposes. Among them are (i) developing cash flow patterns for investment policy and asset mix consideration, (ii) exploring the effect of alternative assumptions about future experience, and (iii) analyzing the impact on plan funding progress of changes in the workforce.

Projection results are useful in demonstrating changing relationships among key elements affecting plan financial activity (e.g., how benefits payable and plan assets will grow in future decades). Projections are not predictions of specific future events and do not provide numeric precision in absolute terms. For instance, cash flow projected to occur 10 years in the future will not be exact (except by coincidence) but understanding the changed relationship between future benefit payout and future investment income can be very useful.

The projection of System finances over 30 years requires an assumption regarding future new entrants to the Systems as well as the regular valuation assumptions used to estimate the timing of future events for current members. As members are assumed to terminate service for any reason, they are replaced with a sufficient number of new entrants to keep the active population constant in number. Valuations are then performed on the projected active and retired membership for each of the thirty years of the study.

Section I - Executive Summary

The main results from the study (details can be found in the following sections of this report) are noted on the following pages.

For HSPRS:

- Utilizing the funding policy for HSPRS, with a fixed contribution rate of 49.08% of payroll for the length of the projection period, the projection results for this study show that the Plan will have a funded ratio of 128.5% in 2042. During last year's study, the funded ratio in 2042 was 88.3%. The main reason for the increase was due to the favorable investment experience for the 2021 fiscal year. The increase was slightly offset by the change in the actuarial assumptions, including the decrease in the investment return assumption from 7.75% to 7.55%. We have assumed that the fund will earn 7.55% for each of the projection years and that the actuarial assumptions in the back of this report are experienced.

- **This result meets the funding goals and benchmarks set by the Board in the current funding policy and <u>no change in the employer contribution rate</u> from 49.08% is necessary at this time.**

For SLRP:

- Utilizing the funding policy for SLRP, with a fixed contribution rate of 7.40% of payroll for the length of the projection period, the projection results for this study show that the Plan will have a funded ratio of 129.8% in 2042. During last year's study, the funded ratio in 2042 was 88.3%. The main reason for the increase was due to the favorable investment experience. The increase was slightly offset by the change in the actuarial assumptions, including the decrease in the investment return assumption from 7.75% to 7.55%. We have assumed that the fund will earn 7.55% for each of the projection years and that the actuarial assumptions in the back of this report are experienced.

- **This result meets the funding goals and benchmarks set by the Board in the current funding policy and <u>no change in the employer contribution rate</u> from 7.40% is necessary at this time.**

It must be kept in mind that projections do not purport to show exact numerical results over the entire period under study. They do however provide a good basis for drawing conclusions about the likely position of the Systems and the relative impact changes over the years will have on System finances. Below are tables showing the summary of the funded ratios in 2042 for each of the two plans.

2021 Summary of Funded Ratios in 2042

System	7.55% Assumption	7.25% Assumption	7.00% Assumption
HSPRS	128.5%	114.1%	103.3%
SLRP	129.8%	114.8%	103.4%

Reconciliation of Projected Funded Ratio in 2042 from 2020 to 2021

Below is a reconciliation of the projected funded ratio for both plans.

	HSPRS	SLRP
2020 Projected Funded Ratio in 2042	**88.3%**	**88.3%**
Change in Employer Contribution Rate	**0.0%**	**0.0%**
Assumption Changes	**(8.6)%**	**(7.9)%**
Investment Experience	**47.2%**	**50.9%**
Method Change	**0.0%**	**0.0%**
Demographic Experience	**1.6%**	**(1.5)%**
2021 Projected Funded Ratio in 2042	**128.5%**	**129.8%**

Section II – HSPRS Projection Results

SPECIAL ASSUMPTIONS

In addition to the regular valuation assumptions used in performing the annual actuarial valuations of HSPRS (all assumptions utilized in the projection study are outlined in Appendix A), 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 three years (2019, 2020 and 2021). That profile is summarized in the table below.

Age	Average Pay	Percent Male	Weight
23	$42,000	90%	14%
25	$43,000	95%	32%
29	$41,000	94%	23%
32	$42,000	80%	14%
38	$43,000	99%	7%
41	$43,000	99%	6%
48	$44,000	99%	4%

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, 2021 would remain in place for the following 30 years.

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, 2021 and those who are hired after June 30, 2021. 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	2021	2026	2031	2042	2051
Active – Existing Employees	478	358	246	70	8
Active – New Entrants	0	157	269	445	507
Retirees	575	678	774	937	1,050
Beneficiaries	173	195	212	211	215
Disableds	13	11	11	12	17
Vested Terminations	40	33	45	64	74
Total	1,279	1,432	1,557	1,739	1,871

PROJECTION RESULTS

The baseline projection results shown below use the same actuarial assumptions as used the June 30, 2021 actuarial valuation report. Please note that contributions from SB 2659 and HB 1015 are assumed to continue to provide an additional $3,700,000 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)

	2021	2026	2031	2042	2051
Total Payroll	$29,780	$34,542	$37,016	$45,816	$57,202
UAL	$169,386	$74,505	$17,635	$0	$0
Normal Cost Rate	16.29%	16.40%	16.44%	16.50%	16.65%
UAL Rate	32.79%	32.68%	32.64%	32.58%	32.43%
Total Rate	49.08%	49.08%	49.08%	49.08%	49.08%
Funding Ratio	70.4%	88.3%	97.5%	100.0%	100.0%
Amortization Period	21 years	6 years	1 year	0 years	0 years
Cash Flow %	(3.70)%	(3.46)%	(3.61)%	(2.79)%	(1.83)%

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

	2021	2026	2031	2042	2051
Total Payroll	$29,780	$34,542	$37,016	$45,816	$57,202
UAL	$169,386	$101,588	$61,243	$0	$0
Normal Cost Rate	16.29%	18.36%	18.41%	18.50%	18.68%
UAL Rate	32.79%	30.72%	30.67%	30.58%	30.40%
Total Rate	49.08%	49.08%	49.08%	49.08%	49.08%
Funding Ratio	70.4%	84.6%	91.5%	100.0%	100.0%
Amortization Period	21 years	9 years	5 years	0 years	0 years
Cash Flow %	(3.70)%	(3.51)%	(3.73)%	(3.03)%	(2.08)%

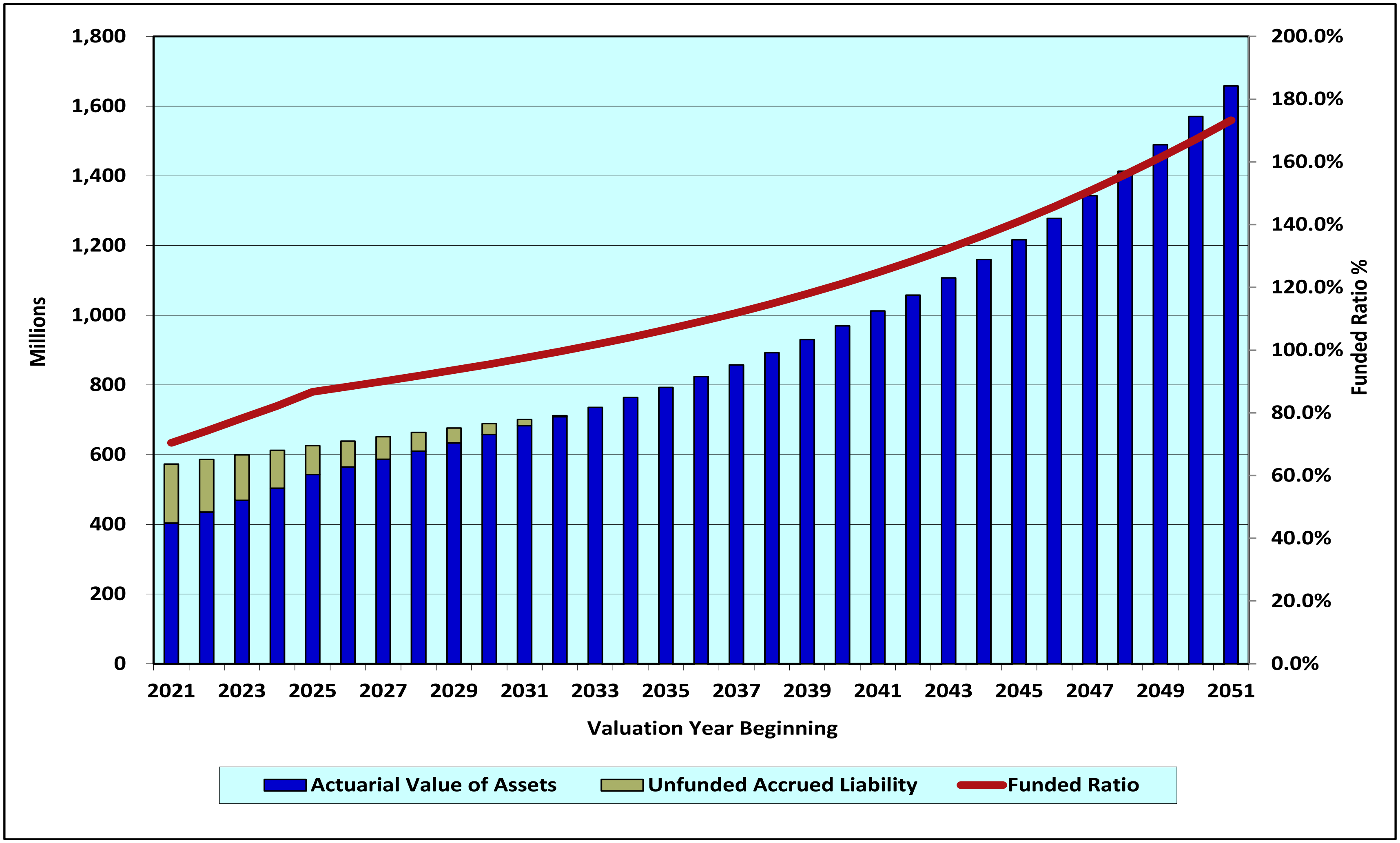
Section II – HSPRS Projection Results

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

	2021	2026	2031	2042	2051
Total Payroll	$29,780	$34,542	$37,016	$45,816	$57,202
UAL	$169,386	$124,276	$97,371	$0	$0
Normal Cost Rate	16.29%	19.96%	20.02%	20.14%	20.35%
UAL Rate	32.79%	29.12%	29.06%	28.94%	28.73%
Total Rate	49.08%	49.08%	49.08%	49.08%	49.08%
Funding Ratio	70.4%	81.7%	86.9%	100.0%	100.0%
Amortization Period	21 years	12 years	8 years	0 years	0 years
Cash Flow %	(3.70)%	(3.56)%	(3.83)%	(3.25)%	(2.33)%

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 page 13. As you can see, under the current assumptions, the funded ratio shows a steady increase during the projection period reaching 100% in 2033.

Mississippi PERS – HSPRS Plan
30 Year Projection of Funded Ratio on Actuarial Asset Value
Based on June 30, 2021 Valuation Results



Section III – SLRP Projection Results

SPECIAL ASSUMPTIONS

In addition to the regular valuation assumptions used in performing the annual actuarial valuations of SLRP (all assumptions utilized in the projection study are outlined in Appendix B), 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.

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 over the 4-year period prior to the projection start date of June 30, 2021.

It is important to note that an eligibility service load of 2.50 years was included in the new entrant profile as the census data shows more and more active members in SLRP are entering the Plan with service from the PERS plan. Please also note that while the annual compensation for active members of SLRP was significantly higher for the fiscal year ending June 30, 2021 than in past years due to more legislative sessions, we have assumed going forward that annual compensation will return to more normal levels. The new entrant profile is summarized in the table below.

Age	Average Pay	Percent Male	Weight
29	$41,000	80%	15%
40	$41,000	80%	15%
44	$41,000	80%	26%
52	$41,000	80%	18%
57	$41,000	80%	15%
67	$41,000	80%	11%

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, 2021 would remain in place for the following 30 years.

Section III – SLRP 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, 2021 and those who are hired after June 30, 2021. Although the 2021 active headcounts were at 173 actives, we have assumed the active membership will continue at the current maximum population of 174 active members over the projected period. As can be seen from the chart below, the retiree and deferred vested headcount begins to drop as retiree deaths outnumber new retirees.

Member	2021	2026	2031	2042	2051
Active – Existing Employees	173	115	72	18	5
Active – New Entrants	0	59	102	156	169
Retired/Deferred Vesteds	266	280	274	234	199
Total	439	454	448	408	373

PROJECTION RESULTS

The baseline projection results shown below use the same actuarial assumption as used in the June 30, 2021 actuarial valuation report. 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)

	2021	2026	2031	2042	2051
Total Payroll	$8,030	$7,676	$8,814	$11,952	$15,198
UAL	$5,422	$243	$0	$0	$0
Normal Cost Rate	2.85%	3.46%	3.61%	3.67%	3.52%
UAL Rate	4.55%	3.94%	3.79%	3.73%	3.88%
Total Rate	7.40%	7.40%	7.40%	7.40%	7.40%
Funding Ratio	78.7%	99.1%	100.0%	100.0%	100.0%
Amortization Period	25 years	1 year	0 years	0 years	0 years
Cash Flow %	(4.02)%	(4.68)%	(4.98)%	(3.08)%	(2.22)%

Section III – SLRP Projection Results

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

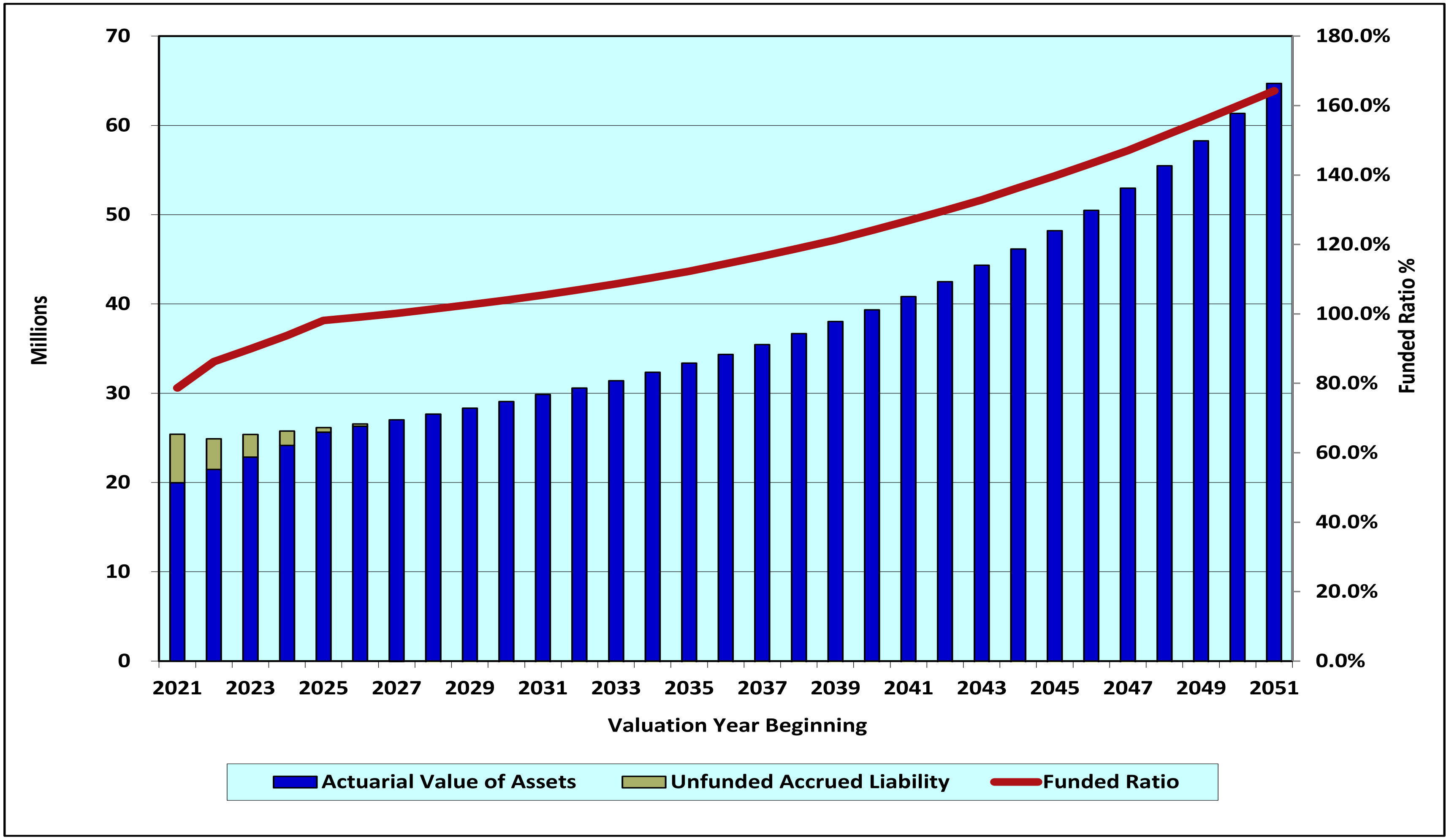
	2021	2026	2031	2042	2051
Total Payroll	$8,030	$7,676	$8,814	$11,952	$15,198
UAL	$5,422	$1,244	$195	$0	$0
Normal Cost Rate	2.85%	3.85%	4.01%	4.07%	3.91%
UAL Rate	4.55%	3.55%	3.39%	3.33%	3.49%
Total Rate	7.40%	7.40%	7.40%	7.40%	7.40%
Funding Ratio	78.7%	95.4%	99.3%	100.0%	100.0%
Amortization Period	25 years	5 years	1 year	0 years	0 years
Cash Flow %	(4.02)%	(4.76)%	(5.16)%	(3.38)%	(2.57)%

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

	2021	2026	2031	2042	2051
Total Payroll	$8,030	$7,676	$8,814	$11,952	$15,198
UAL	$5,422	$2,079	$1,617	$0	$0
Normal Cost Rate	2.85%	4.17%	4.34%	4.40%	4.24%
UAL Rate	4.55%	3.23%	3.06%	3.00%	3.16%
Total Rate	7.40%	7.40%	7.40%	7.40%	7.40%
Funding Ratio	78.7%	92.5%	94.6%	100.0%	100.0%
Amortization Period	25 years	10 years	7 years	0 years	0 years
Cash Flow %	(4.02)%	(4.82)%	(5.32)%	(3.66)%	(2.92)%

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 page 17. As you can see, under the current assumptions, the funded ratio shows a steady increase during the projection period reaching 100% in 2027.

Mississippi PERS – SLRP Plan
30 Year Projection of Funded Ratio on Actuarial Asset Value
Based on June 30, 2021 Valuation Results



Section IV – Cash Flow Analysis

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 and SLRP, have negative cash flow, where benefit payments paid out of the trust are more than the contributions being collected by employers and employees.

For the fiscal year ending June 30, 2022, we are projecting HSPRS to have a negative cash flow of approximately $17 Million (benefit payments of $39 Million and contributions of $22 Million). With a market value of assets of $464 Million as of June 30, 2021, the cash flow as a percentage of assets is estimated to be negative 3.70% for the 2022 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 2022 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.

For the fiscal year ending June 30, 2022, we are projecting SLRP to have a negative cash flow of approximately $0.9 Million (benefit payments of $1.8 Million and contributions of $0.9 Million). With a market value of assets of $22.9 Million as of June 30, 2021, the cash flow as a percentage of assets is estimated to be negative 4.02% for the 2022 fiscal year.

Section IV – Cash Flow Analysis

The tables on the following pages demonstrate the open group projection of cash flow on the baseline assumption and then a sensitivity analysis, using a one-year return of negative 7.00% for the fiscal year ending June 30, 2022. This demonstrates the projection of this metric if either System 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 tables on pages 22 and 24, the cash flow as a percentage of market value of assets does not at any point get less than negative 5.1% on the baseline assumptions, meaning that HSPRS and SLRP 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 tables on pages 23 and 25), the negative cash flow will be less than the baseline cash flow, however, neither Plan will have a decrease in their assets at any point during the remaining projection period.

Mississippi PERS
30-year Open Group Projection of Cash Flow
HSPRS Plan
Based on June 30, 2021 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
2021	7.55%	31,012,146	463,984,000	21,518,525	(38,695,482)	-3.70%	34,394,160	17,217,203	481,201,203	2022
2022	7.55%	32,970,828	481,201,203	22,643,917	(38,791,193)	-3.36%	35,732,222	19,584,946	500,786,149	2023
2023	7.55%	33,482,045	500,786,149	22,937,645	(39,632,409)	-3.33%	37,190,593	20,495,829	521,281,977	2024
2024	7.55%	34,044,778	521,281,977	23,260,972	(40,841,119)	-3.37%	38,705,213	21,125,065	542,407,043	2025
2025	7.55%	34,542,474	542,407,043	23,546,931	(42,077,347)	-3.42%	40,264,936	21,734,520	564,141,563	2026
2026	7.55%	35,053,953	564,141,563	23,840,810	(43,360,355)	-3.46%	41,869,232	22,349,687	586,491,249	2027
2027	7.55%	35,553,395	586,491,249	24,127,772	(44,545,893)	-3.48%	43,523,329	23,105,208	609,596,457	2028
2028	7.55%	36,068,514	609,596,457	24,423,742	(45,940,812)	-3.53%	45,227,042	23,709,972	633,306,429	2029
2029	7.55%	36,492,089	633,306,429	24,667,114	(47,278,964)	-3.57%	46,976,569	24,364,719	657,671,148	2030
2030	7.55%	37,016,002	657,671,148	24,968,136	(48,542,491)	-3.58%	48,780,432	25,206,077	682,877,225	2031
2031	7.55%	37,596,795	682,877,225	25,301,840	(49,929,646)	-3.61%	50,644,446	26,016,640	708,893,864	2032
2032	7.55%	38,097,578	708,893,864	25,589,573	(51,319,166)	-3.63%	52,567,867	26,838,274	735,732,138	2033
2033	7.55%	38,640,921	735,732,138	25,901,759	(52,476,079)	-3.61%	54,562,848	27,988,528	763,720,667	2034
2034	7.55%	39,411,603	763,720,667	26,344,567	(53,603,505)	-3.57%	56,650,608	29,391,670	793,112,337	2035
2035	7.55%	40,218,750	793,112,337	26,808,326	(54,516,878)	-3.49%	58,853,015	31,144,463	824,256,799	2036
2036	7.55%	41,085,510	824,256,799	27,306,337	(55,458,337)	-3.42%	61,187,986	33,035,986	857,292,785	2037
2037	7.55%	41,952,589	857,292,785	27,804,531	(56,355,862)	-3.33%	63,667,403	35,116,073	892,408,858	2038
2038	7.55%	42,864,458	892,408,858	28,328,460	(57,319,616)	-3.25%	66,302,365	37,311,209	929,720,067	2039
2039	7.55%	43,751,128	929,720,067	28,837,911	(58,123,610)	-3.15%	69,108,444	39,822,745	969,542,812	2040
2040	7.55%	44,768,974	969,542,812	29,422,730	(58,900,899)	-3.04%	72,107,928	42,629,760	1,012,172,572	2041
2041	7.55%	45,815,505	1,012,172,572	30,024,031	(59,557,121)	-2.92%	75,324,440	45,791,350	1,057,963,922	2042
2042	7.55%	46,995,460	1,057,963,922	30,701,993	(60,204,662)	-2.79%	78,782,814	49,280,145	1,107,244,067	2043
2043	7.55%	48,145,988	1,107,244,067	31,363,048	(61,022,852)	-2.68%	82,497,641	52,837,837	1,160,081,905	2044
2044	7.55%	49,224,301	1,160,081,905	31,982,610	(61,857,027)	-2.58%	86,478,943	56,604,526	1,216,686,430	2045
2045	7.55%	50,421,444	1,216,686,430	32,670,447	(62,530,730)	-2.45%	90,753,109	60,892,826	1,277,579,257	2046
2046	7.55%	51,737,072	1,277,579,257	33,426,363	(63,217,147)	-2.33%	95,353,093	65,562,309	1,343,141,565	2047
2047	7.55%	53,084,027	1,343,141,565	34,200,277	(64,033,559)	-2.22%	100,301,472	70,468,190	1,413,609,755	2048
2048	7.55%	54,379,762	1,413,609,755	34,944,762	(64,891,432)	-2.12%	105,617,618	75,670,948	1,489,280,704	2049
2049	7.55%	55,781,115	1,489,280,704	35,749,932	(65,709,387)	-2.01%	111,330,301	81,370,846	1,570,651,549	2050
2050	7.55%	57,201,755	1,570,651,549	36,566,184	(66,694,775)	-1.92%	117,467,531	87,338,940	1,657,990,489	2051
2051	7.55%	58,614,182	1,657,990,489	37,377,716	(67,677,547)	-1.83%	124,055,274	93,755,443	1,751,745,932	2052

Mississippi PERS
30-year Open Group Projection of Cash Flow
HSPRS Plan
Based on June 30, 2021 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
2021	-7.00%	31,012,146	463,984,000	21,518,525	(38,695,482)	-3.70%	(31,866,780)	(49,043,737)	414,940,263	2022
2022	7.55%	32,970,828	414,940,263	22,643,917	(38,791,193)	-3.89%	30,729,521	14,582,245	429,522,508	2023
2023	7.55%	33,482,045	429,522,508	22,937,645	(39,632,409)	-3.89%	31,810,189	15,115,425	444,637,932	2024
2024	7.55%	34,044,778	444,637,932	23,260,972	(40,841,119)	-3.95%	32,918,588	15,338,440	459,976,373	2025
2025	7.55%	34,542,474	459,976,373	23,546,931	(42,077,347)	-4.03%	34,041,420	15,511,004	475,487,377	2026
2026	7.55%	35,053,953	475,487,377	23,840,810	(43,360,355)	-4.11%	35,175,841	15,656,296	491,143,672	2027
2027	7.55%	35,553,395	491,143,672	24,127,772	(44,545,893)	-4.16%	36,324,587	15,906,466	507,050,138	2028
2028	7.55%	36,068,514	507,050,138	24,423,742	(45,940,812)	-4.24%	37,484,795	15,967,725	523,017,863	2029
2029	7.55%	36,492,089	523,017,863	24,667,114	(47,278,964)	-4.32%	38,649,782	16,037,932	539,055,795	2030
2030	7.55%	37,016,002	539,055,795	24,968,136	(48,542,491)	-4.37%	39,824,972	16,250,617	555,306,412	2031
2031	7.55%	37,596,795	555,306,412	25,301,840	(49,929,646)	-4.43%	41,012,850	16,385,044	571,691,455	2032
2032	7.55%	38,097,578	571,691,455	25,589,573	(51,319,166)	-4.50%	42,209,085	16,479,492	588,170,947	2033
2033	7.55%	38,640,921	588,170,947	25,901,759	(52,476,079)	-4.52%	43,421,978	16,847,658	605,018,606	2034
2034	7.55%	39,411,603	605,018,606	26,344,567	(53,603,505)	-4.51%	44,668,602	17,409,664	622,428,270	2035
2035	7.55%	40,218,750	622,428,270	26,808,326	(54,516,878)	-4.45%	45,966,368	18,257,816	640,686,085	2036
2036	7.55%	41,085,510	640,686,085	27,306,337	(55,458,337)	-4.39%	47,328,397	19,176,397	659,862,482	2037
2037	7.55%	41,952,589	659,862,482	27,804,531	(56,355,862)	-4.33%	48,761,415	20,210,085	680,072,567	2038
2038	7.55%	42,864,458	680,072,567	28,328,460	(57,319,616)	-4.26%	50,270,975	21,279,819	701,352,386	2039
2039	7.55%	43,751,128	701,352,386	28,837,911	(58,123,610)	-4.18%	51,866,685	22,580,986	723,933,372	2040
2040	7.55%	44,768,974	723,933,372	29,422,730	(58,900,899)	-4.07%	53,564,415	24,086,247	748,019,619	2041
2041	7.55%	45,815,505	748,019,619	30,024,031	(59,557,121)	-3.95%	55,380,892	25,847,802	773,867,421	2042
2042	7.55%	46,995,460	773,867,421	30,701,993	(60,204,662)	-3.81%	57,333,528	27,830,859	801,698,280	2043
2043	7.55%	48,145,988	801,698,280	31,363,048	(61,022,852)	-3.70%	59,428,934	29,769,130	831,467,411	2044
2044	7.55%	49,224,301	831,467,411	31,982,610	(61,857,027)	-3.59%	61,668,549	31,794,132	863,261,542	2045
2045	7.55%	50,421,444	863,261,542	32,670,447	(62,530,730)	-3.46%	64,069,530	34,209,247	897,470,790	2046
2046	7.55%	51,737,072	897,470,790	33,426,363	(63,217,147)	-3.32%	66,654,904	36,864,120	934,334,909	2047
2047	7.55%	53,084,027	934,334,909	34,200,277	(64,033,559)	-3.19%	69,436,570	39,603,288	973,938,197	2048
2048	7.55%	54,379,762	973,938,197	34,944,762	(64,891,432)	-3.07%	72,422,416	42,475,746	1,016,413,944	2049
2049	7.55%	55,781,115	1,016,413,944	35,749,932	(65,709,387)	-2.95%	75,628,861	45,669,406	1,062,083,349	2050
2050	7.55%	57,201,755	1,062,083,349	36,566,184	(66,694,775)	-2.84%	79,070,632	48,942,041	1,111,025,390	2051
2051	7.55%	58,614,182	1,111,025,390	37,377,716	(67,677,547)	-2.73%	82,759,409	52,459,578	1,163,484,968	2052

Mississippi PERS
30-year Open Group Projection of Cash Flow
SLRP Plan
Based on June 30, 2021 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
2021	*7.55%*	*8,242,456*	*22,950,000*	*874,360*	*(1,796,260)*	-4.02%	*1,698,556*	*776,656*	*23,726,656*	**2022**
2022	*7.55%*	*7,032,896*	*23,726,656*	*746,050*	*(1,816,675)*	-4.51%	*1,751,682*	*681,056*	*24,407,712*	**2023**
2023	*7.55%*	*7,226,720*	*24,407,712*	*766,610*	*(1,939,869)*	-4.81%	*1,799,298*	*626,040*	*25,033,752*	**2024**
2024	*7.55%*	*7,470,551*	*25,033,752*	*792,476*	*(2,026,016)*	-4.93%	*1,844,329*	*610,789*	*25,644,541*	**2025**
2025	*7.55%*	*7,676,392*	*25,644,541*	*814,312*	*(2,043,729)*	-4.79%	*1,890,597*	*661,180*	*26,305,721*	**2026**
2026	*7.55%*	*7,885,896*	*26,305,721*	*836,536*	*(2,068,702)*	-4.68%	*1,940,414*	*708,248*	*27,013,969*	**2027**
2027	*7.55%*	*8,093,350*	*27,013,969*	*858,543*	*(2,213,020)*	-5.01%	*1,989,353*	*634,875*	*27,648,844*	**2028**
2028	*7.55%*	*8,345,868*	*27,648,844*	*885,330*	*(2,244,716)*	-4.92%	*2,037,105*	*677,719*	*28,326,563*	**2029**
2029	*7.55%*	*8,576,959*	*28,326,563*	*909,844*	*(2,263,225)*	-4.78%	*2,088,495*	*735,114*	*29,061,677*	**2030**
2030	*7.55%*	*8,813,979*	*29,061,677*	*934,987*	*(2,280,327)*	-4.63%	*2,144,294*	*798,954*	*29,860,631*	**2031**
2031	*7.55%*	*9,058,686*	*29,860,631*	*960,945*	*(2,447,432)*	-4.98%	*2,199,384*	*712,898*	*30,573,529*	**2032**
2032	*7.55%*	*9,346,979*	*30,573,529*	*991,528*	*(2,415,073)*	-4.66%	*2,255,540*	*831,995*	*31,405,523*	**2033**
2033	*7.55%*	*9,600,888*	*31,405,523*	*1,018,462*	*(2,399,003)*	-4.40%	*2,319,950*	*939,409*	*32,344,933*	**2034**
2034	*7.55%*	*9,861,429*	*32,344,933*	*1,046,100*	*(2,404,851)*	-4.20%	*2,391,683*	*1,032,932*	*33,377,865*	**2035**
2035	*7.55%*	*10,130,775*	*33,377,865*	*1,074,673*	*(2,575,245)*	-4.50%	*2,464,413*	*963,841*	*34,341,706*	**2036**
2036	*7.55%*	*10,439,692*	*34,341,706*	*1,107,443*	*(2,531,416)*	-4.15%	*2,540,022*	*1,116,048*	*35,457,754*	**2037**
2037	*7.55%*	*10,724,267*	*35,457,754*	*1,137,630*	*(2,541,479)*	-3.96%	*2,625,029*	*1,221,181*	*36,678,935*	**2038**
2038	*7.55%*	*11,012,136*	*36,678,935*	*1,168,167*	*(2,533,209)*	-3.72%	*2,718,667*	*1,353,626*	*38,032,561*	**2039**
2039	*7.55%*	*11,308,332*	*38,032,561*	*1,199,588*	*(2,708,544)*	-3.97%	*2,815,532*	*1,306,575*	*39,339,136*	**2040**
2040	*7.55%*	*11,640,190*	*39,339,136*	*1,234,791*	*(2,655,242)*	-3.61%	*2,917,458*	*1,497,007*	*40,836,143*	**2041**
2041	*7.55%*	*11,952,265*	*40,836,143*	*1,267,896*	*(2,637,355)*	-3.35%	*3,032,372*	*1,662,913*	*42,499,056*	**2042**
2042	*7.55%*	*12,273,495*	*42,499,056*	*1,301,972*	*(2,612,436)*	-3.08%	*3,160,109*	*1,849,645*	*44,348,701*	**2043**
2043	*7.55%*	*12,603,583*	*44,348,701*	*1,336,988*	*(2,812,164)*	-3.33%	*3,293,652*	*1,818,476*	*46,167,177*	**2044**
2044	*7.55%*	*12,958,671*	*46,167,177*	*1,374,656*	*(2,762,726)*	-3.01%	*3,434,176*	*2,046,105*	*48,213,282*	**2045**
2045	*7.55%*	*13,305,829*	*48,213,282*	*1,411,482*	*(2,739,413)*	-2.75%	*3,590,885*	*2,262,954*	*50,476,236*	**2046**
2046	*7.55%*	*13,661,907*	*50,476,236*	*1,449,255*	*(2,710,603)*	-2.50%	*3,764,206*	*2,502,858*	*52,979,094*	**2047**
2047	*7.55%*	*14,028,192*	*52,979,094*	*1,488,111*	*(2,920,668)*	-2.70%	*3,946,826*	*2,514,268*	*55,493,362*	**2048**
2048	*7.55%*	*14,417,468*	*55,493,362*	*1,529,405*	*(2,877,830)*	-2.43%	*4,139,772*	*2,791,347*	*58,284,709*	**2049**
2049	*7.55%*	*14,802,888*	*58,284,709*	*1,570,290*	*(2,861,356)*	-2.22%	*4,352,645*	*3,061,580*	*61,346,289*	**2050**
2050	*7.55%*	*15,197,954*	*61,346,289*	*1,612,199*	*(2,833,924)*	-1.99%	*4,586,364*	*3,364,639*	*64,710,928*	**2051**
2051	*7.55%*	*15,601,852*	*64,710,928*	*1,655,044*	*(3,089,807)*	-2.22%	*4,832,498*	*3,397,735*	*68,108,663*	**2052**

Mississippi PERS
30-year Open Group Projection of Cash Flow
SLRP Plan
Based on June 30, 2021 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
2021	-7.00%	8,242,456	22,950,000	874,360	(1,796,260)	-4.02%	(1,573,648)	(2,495,548)	20,454,452	2022
2022	7.55%	7,032,896	20,454,452	746,050	(1,816,675)	-5.23%	1,504,630	434,004	20,888,456	2023
2023	7.55%	7,226,720	20,888,456	766,610	(1,939,869)	-5.62%	1,533,594	360,336	21,248,792	2024
2024	7.55%	7,470,551	21,248,792	792,476	(2,026,016)	-5.81%	1,558,565	325,025	21,573,817	2025
2025	7.55%	7,676,392	21,573,817	814,312	(2,043,729)	-5.70%	1,583,257	353,840	21,927,657	2026
2026	7.55%	7,885,896	21,927,657	836,536	(2,068,702)	-5.62%	1,609,870	377,704	22,305,361	2027
2027	7.55%	8,093,350	22,305,361	858,543	(2,213,020)	-6.07%	1,633,854	279,376	22,584,737	2028
2028	7.55%	8,345,868	22,584,737	885,330	(2,244,716)	-6.02%	1,654,765	295,379	22,880,116	2029
2029	7.55%	8,576,959	22,880,116	909,844	(2,263,225)	-5.92%	1,677,288	323,907	23,204,023	2030
2030	7.55%	8,813,979	23,204,023	934,987	(2,280,327)	-5.80%	1,702,041	356,701	23,560,724	2031
2031	7.55%	9,058,686	23,560,724	960,945	(2,447,432)	-6.31%	1,723,741	237,255	23,797,979	2032
2032	7.55%	9,346,979	23,797,979	991,528	(2,415,073)	-5.98%	1,743,986	320,441	24,118,419	2033
2033	7.55%	9,600,888	24,118,419	1,018,462	(2,399,003)	-5.72%	1,769,773	389,232	24,507,652	2034
2034	7.55%	9,861,429	24,507,652	1,046,100	(2,404,851)	-5.54%	1,799,968	441,217	24,948,869	2035
2035	7.55%	10,130,775	24,948,869	1,074,673	(2,575,245)	-6.01%	1,828,024	327,452	25,276,321	2036
2036	7.55%	10,439,692	25,276,321	1,107,443	(2,531,416)	-5.63%	1,855,585	431,611	25,707,932	2037
2037	7.55%	10,724,267	25,707,932	1,137,630	(2,541,479)	-5.46%	1,888,918	485,070	26,193,002	2038
2038	7.55%	11,012,136	26,193,002	1,168,167	(2,533,209)	-5.21%	1,926,979	561,938	26,754,940	2039
2039	7.55%	11,308,332	26,754,940	1,199,588	(2,708,544)	-5.64%	1,964,071	455,114	27,210,054	2040
2040	7.55%	11,640,190	27,210,054	1,234,791	(2,655,242)	-5.22%	2,001,713	581,262	27,791,316	2041
2041	7.55%	11,952,265	27,791,316	1,267,896	(2,637,355)	-4.93%	2,047,488	678,029	28,469,345	2042
2042	7.55%	12,273,495	28,469,345	1,301,972	(2,612,436)	-4.60%	2,100,866	790,402	29,259,747	2043
2043	7.55%	12,603,583	29,259,747	1,336,988	(2,812,164)	-5.04%	2,154,436	679,260	29,939,007	2044
2044	7.55%	12,958,671	29,939,007	1,374,656	(2,762,726)	-4.64%	2,208,949	820,878	30,759,885	2045
2045	7.55%	13,305,829	30,759,885	1,411,482	(2,739,413)	-4.32%	2,273,154	945,223	31,705,108	2046
2046	7.55%	13,661,907	31,705,108	1,449,255	(2,710,603)	-3.98%	2,346,986	1,085,638	32,790,746	2047
2047	7.55%	14,028,192	32,790,746	1,488,111	(2,920,668)	-4.37%	2,422,606	990,048	33,780,794	2048
2048	7.55%	14,417,468	33,780,794	1,529,405	(2,877,830)	-3.99%	2,500,473	1,152,048	34,932,842	2049
2049	7.55%	14,802,888	34,932,842	1,570,290	(2,861,356)	-3.70%	2,589,579	1,298,514	36,231,356	2050
2050	7.55%	15,197,954	36,231,356	1,612,199	(2,833,924)	-3.37%	2,690,186	1,468,461	37,699,817	2051
2051	7.55%	15,601,852	37,699,817	1,655,044	(3,089,807)	-3.81%	2,793,159	1,358,396	39,058,213	2052

Section V – Sensitivity Analysis

As mentioned earlier in the report, the intended purpose of the Projection Report 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 Report 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 Report process, like other actuarial modeling, is not intended to provide absolute results. The intended purpose of the Projection Report 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 Report 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.

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 V – Sensitivity Analysis

Annual actuarial valuations are performed for HSPRS and SLRP 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 and SLRP also have 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.

Section V – 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	HSPRS	SLRP
• 1.55% in 2022	114.3%	112.1%
• 3.55% in 2022	119.0%	118.0%
• 5.55% in 2022	123.7%	123.9%
• **7.55% in 2022 (Baseline)**	**128.5%**	**129.8%**
• 9.55% in 2022	133.2%	135.7%
• 11.55% in 2022	138.0%	141.6%
• 13.55% in 2022	142.7%	147.5%
• Simulate 2008 loss using -15% in 2022	75.0%	63.4%
Average Returns over next 10-Year Period (Simulated returns using mean and standard deviations from PERS' Investment Consultant's Capital Market Assumptions)*		
• 6.00%	98.5%	94.6%
• 7.00%	117.6%	117.3%
• 8.00%	141.9%	147.4%

* *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%

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 these Plans 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 V – 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, meaning the active membership will be the same in each of the projections than it is in 2021. 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. Since SLRP has a set number of active legislative members and should remain static over the projection period, we have not reviewed the sensitivity around this assumption. In the table below, we review these alternatives to the static active membership growth:

Projected Funded Ratio in 2042

Active Membership Growth	HSPRS
• Increase 0.50% each year	130.3%
• Increase 0.25% each year	129.4%
• **Static Population (Baseline Assumption)**	**128.5%**
• Decrease 0.25% each year	127.6%
• Decrease 0.50% each year	126.7%

Section V – 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	HSPRS	SLRP
1 - Baseline	2.40%	7.55%	2.65%	**128.5%**	**129.8%**
2	2.40%	7.30%	2.65%	116.4%	117.2%
3	2.10%	7.30%	2.35%	114.9%	116.4%

Contribution Risk

To demonstrate the contribution risk of making the Fixed Contribution Rates (FCR) for all three plans, we have calculated the projected funded ratios if the FCRs were 1% higher or 1% lower than the current rates for all future years beginning on July 1, 2023.

Projected Funded Ratios in 2042

Change in Fixed Contribution Rate (FCR)	HSPRS	SLRP
• Baseline	**128.5%**	**129.8%**
• 1.00% increase in FCR	130.4%	141.1%
• 1.00% decrease in FCR	126.6%	118.4%

As can be seen in the table above, the contribution risk has a much bigger impact for SLRP than for HSPRS.

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 VI – Conclusion

2021 Summary of Funded Ratios in 2042

System	7.55% Assumption	7.25% Assumption	7.00% Assumption
HSPRS	128.5%	114.1%	103.3%
SLRP	129.8%	114.8%	103.4%

HSPRS

Utilizing the funding policy for HSPRS, with a fixed contribution rate of 49.08% of payroll for the length of the projection period, the projection results for 2021 show that the Plan will have a funded ratio of 128.5% in 2042 at a 7.55% assumption. **This result meets the funding goals and benchmarks set by the Board in the current funding policy and no change in the HSPRS employer contribution rate is necessary at this time.**

SLRP

Utilizing the funding policy for SLRP, with a fixed contribution rate of 7.40% of payroll for the length of the projection period, the projection results for 2021 show that the Plan will have a funded ratio of 129.8% in 2042 at a 7.55% assumption. **This result meets the funding goals and benchmarks set by the Board in the current funding policy and no change in the SLRP employer contribution rate is necessary at this time.**

Going forward, short-term variations, both positive and negative, are to be expected given the volatility inherent in the actual investment return from year to year and should not elicit extreme concern without further analysis. With the addition of several actuarial metrics and sensitivity to the projection results, the Board now has more information on the trend of funded ratios for each of the Systems when making decisions in the future.

Appendix A – HSPRS Actuarial Assumptions and Methods

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.

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.

Appendix A – HSPRS Actuarial Assumptions and Methods

PAYROLL GROWTH: 2.65% per annum, compounded annually.

ADMINISTRATIVE EXPENSES: 0.28% 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.

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.

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.

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.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded actuarial accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from the HSPRS. The accrued liability contribution amortizes the balance of the unfunded actuarial accrued liability over a period of years from the valuation date.

Appendix B – SLRP Actuarial Assumptions and Methods

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 rates of separation from active service are as follows:

	Annual Rate of		
	Death*		
Age	**Male**	**Female**	**Disability****
20	0.0483%	0.0126%	0.04%
25	0.0567	0.0189	0.05
30	0.0630	0.0259	0.07
35	0.0714	0.0350	0.11
40	0.0893	0.0483	0.17
45	0.1218	0.0665	0.23
50	0.1764	0.0917	0.30
55	0.2594	0.1274	0.35
60	0.3980	0.1757	0.40
65	0.6353	0.2429	0.00
70	1.1655	0.4739	0.00
75	2.1389	0.9247	0.00

* Adjusted Base rates.
** 93% are presumed to be non-duty related, and 7% are assumed to be duty related.

WITHDRAWAL AND VESTING: 15% in an election year, 2% in a non-election year.

SERVICE RETIREMENT: 30% in an election year, 2.5% in a non-election year. All members are assumed to retire no later than age 80.

It is assumed that a member will be granted 2.5 years of service credit for unused leave at termination of employment.

SALARY INCREASES: 2.65% per annum, for all ages.

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.

PAYROLL GROWTH: 2.65% per annum, compounded annually.

ADMINISTRATIVE EXPENSES: 0.28% of payroll.

TIMING OF DECREMENTS AND PAY INCREASES: Middle of Year.

ASSUMED INTEREST RATE ON EMPLOYEE CONTRIBUTIONS: 2.00%

MARRIAGE ASSUMPTION: 85% married with the husband three years older than his wife.

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.

MAXIMUM COVERED EARNINGS ASSUMPTION GROWTH: 2.65%

Appendix B – SLRP Actuarial Assumptions and Methods

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

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 SLRP are determined following a level funding approach and consist of a normal contribution and an accrued liability contribution.

The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded actuarial accrued liability is determined by subtracting the current assets and the present value of prospective employer normal contributions and member contributions from the present value of expected benefits to be paid from the SLRP. The accrued liability contribution amortizes the balance of the unfunded actuarial accrued liability over a period of years from the valuation date.

Appendix C – Board Funding Policies

Funding Policy for HSPRS

The purpose of the funding policy is to state the overall funding goals for the Mississippi Highway Safety Patrol Retirement System (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.

The policy refers to pension benefits and does not address retiree healthcare benefits that may be provided under statute in the future. In addition to periodic reviews of this policy, the Board will amend the policy if retiree healthcare benefits become payable.

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 projection reports, 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 following three consecutive annual projection reports, 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 reaches a level that triggers a change in contribution rates. The initial employer contribution rate set under this policy as revised June 19, 2013 is 37.00 percent of active member payroll effective July 1, 2013. This contribution rate will increase to 49.08 percent of active member payroll effective July 1, 2018.

- **Unfunded Actuarial Accrued Liability (UAAL) amortization period -** The amortization period for the System's UAAL should be declining over time.

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.

Appendix C – Board Funding Policies

Funding Policy for SLRP

The purpose of the funding policy is to state the overall funding goals for the Supplemental Legislative Retirement Plan (referred to as "System" in this policy), 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.

The policy refers to pension benefits and does not address retiree healthcare benefits that may be provided under statute in the future. In addition to periodic reviews of this policy, the Board will amend the policy if retiree healthcare benefits become payable.

I. Funding Goals

The objective in requiring employer and member contributions to the System 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 projected funded ratio is less than 60 percent in 2042 or if the projected funded ratio is projected to be less than 75 percent in 2042 following two consecutive annual projection reports, a contribution rate increase will be determined that is sufficient to generate a funded ratio of 85 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 following two consecutive annual projection reports, 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 rates for the Supplemental Legislative Retirement Plan (SLRP) set under this policy, as revised October 23, 2012, will be 7.40 percent of active member payroll effective July 1, 2013.

- **Unfunded Actuarial Accrued Liability (UAAL) amortization period -** The amortization period for the System's UAAL should be declining over time.

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.

The actuarial assumptions used will be those last adopted by the 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 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.

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PERS
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Report on the Annual Valuation of the Mississippi Municipal Retirement Systems

Prepared as of June 30, 2021

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The experience and dedication you deserve

December 8, 2021

Board of Trustees
Mississippi Municipal Retirement Systems
429 Mississippi Street
Jackson, MS 39201-1005

Ladies and Gentlemen:

Presented in this report are the results of the annual actuarial valuation covering the participation of 17 municipalities in the Mississippi Municipal Retirement Systems (MRS). MRS is a closed, defined benefit pension plan that was closed to new members beginning July 1, 1987. The purpose of the valuation is to measure the Systems' funding progress and to certify the employer contribution rates (millage rates) necessary for the period beginning October 1, 2022. The results may not be applicable for other purposes.

The date of the valuation was June 30, 2021.

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 certified millage rates on page 5 and the comments on page 7.

The calculations of these millage rates are based on the funding policy which extended contributions beyond 2020 and generated an ultimate asset reserve level equal to projected benefit payments.

Since the previous valuation, the Board adopted new actuarial assumptions based on the experience investigation for the four-year period ending June 30, 2020. The changes are summarized on page 2 of this report.

Since the previous valuation, there was one change made to the benefit provisions. The City of Tupelo granted a 1% ad-hoc benefit increase for members who were retired for at least one full fiscal year as of September 30, 2020.

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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.

We note that as we are preparing this report, the world is in the midst of a pandemic. We have considered available information, but do not believe that there is yet sufficient data to warrant the modification of any of our assumptions. We will continue to monitor the situation and advise the Board in the future of any adjustments that we believe would be appropriate due to the pandemic.

In order to prepare the results in this report we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results.

This actuarial valuation was performed to determine the adequacy of statutory contributions 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

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

Ben Mobley

Ben Mobley, ASA, FCA, MAAA
Consulting Actuary

Table of Contents

REPORT ON THE ANNUAL VALUATION OF THE MISSISSIPPI MUNICIPAL RETIREMENT SYSTEMS PREPARED AS OF JUNE 30, 2021

1. This report, prepared as of June 30, 2021, presents the results of the annual actuarial valuation of the 17 Systems. 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 reflects any amendments to the Systems effective through July 1, 2021. Please note that the Plan has only retired members remaining.

VALUATION DATE	June 30, 2021	June 30, 2020
Retirees		
Number	1,510	1,585
Annual allowances	$ 30,845,547	$ 31,819,367
Assets		
Market related actuarial value	$ 140,258,345	$ 140,731,034
Market value	$ 159,572,184	$ 136,780,881
Unfunded Accrued Liability	$ 134,167,637	$ 145,705,405

2. Rates of contribution payable by employers are given in Section III and comments on the valuation results are given in Section IV.

3. The current funding policy was adopted by the Board in February 2011. In this funding policy, contributions are extended past 2020 and an employer contribution rate, expressed as a millage rate tax applied to assessed property values, is established that will generate an ultimate asset reserve level equal to a reasonable percentage (initially 100% - 150%) of the next year's projected benefit payment. At that point, employer contributions are set equal to the fiscal year's projected benefit payments (basically on a pay as you go basis) and adjusted as necessary to maintain the assets at the established reserve level. This calculation is performed using projected cash flow analysis using the current market value of assets as of the valuation date, a 6.05% assumption on investment earnings and an assumption that assessed property values will remain level over time. Schedule H of this report shows the projected cash flow of each municipality, including the certified millage rates, based on the funding policy.

4. Schedule A of this report presents the development of the actuarial value of assets.

5. Schedule B details the actuarial assumptions and methods employed. Since the previous valuation, various economic and demographic assumptions have been revised. The changes are summarized below and shown in more detail in Schedule B:

   - Changes were made to the Mortality Table for both healthy and disabled lives.
   - The investment rate of return assumption was reduced from 7.75% to 7.55%.
   - The investment return assumption to calculate the certified millage rates was lowered from 6.25% to 6.05% to maintain a 150 basis point difference with the long-term investment return assumption.

6. Schedule C details the summary of benefit and contribution provisions of the Plan. Since the previous valuation, the following changes were made to the benefit provisions:

   - The City of Tupelo granted a 1% ad-hoc benefit increase for members who were retired for at least one full fiscal year as of September 30, 2020.

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

Mississippi Municipal Retirement Systems

Comparative Schedule

	Active Members				Retired Lives				Valuation Results ($ thousands)		
Valuation Date June 30*	Number	Payroll ($ thousands)	Average Salary	% increase from previous year	Number	Active/ Retired Ratio	Annual Benefits ($ thousands)	Benefits as % of Payroll	Accrued Liability	Valuation Assets	Unfunded Accrued Liability
2012	21	$1,131	$53,869	(0.7)%	1,978	.01	$35,097.3	3,103.2%	$356,571	$155,484	$201,087
2013	16	794	49,615	(7.9)	1,941	.01	35,105.9	4,421.4	349,588	153,241	196,347
2014	14	727	51,953	4.7	1,890	.01	34,723.5	4,776.3	340,385	157,970	182,415
2015	11	579	52,661	1.4	1,849	.01	34,478.4	5,954.8	341,525	162,616	178,909
2016	8	419	52,375	(0.5)	1,798	.00	34,088.4	8,135.7	330,663	159,160	171,503
2017	6	321	53,541	2.2	1,754	.00	33,751.5	10,514.5	321,747	157,674	164,073
2018	4	200	49,936	(6.7)	1,694	.00	32,997.7	16,498.9	307,456	154,749	152,707
2019	2	95	47,436	(5.0)	1,634	.00	32,423.3	34,129.8	296,006	147,671	148,335
2020	0	0	0	N/A	1,585	.00	31,819.4	N/A	286,436	140,731	145,705
2021	0	0	0	N/A	1,510	.00	30,845.5	N/A	274,426	140,258	134,168

* Valuation date was as of September 30 for years prior to 2013.

Section II - Membership Data

Data regarding the membership of the Systems for use as a basis for the valuation were furnished by the PERS office. There are no more remaining active members in the closed System. However, there are still 1,510 retirees, disability retirees and survivors collecting benefits from the System as of the valuation date. The following table summarizes the retirement membership of the system as of June 30, 2021 upon which the valuation was based. Detailed tabulations of the data are given in Schedule D.

Retired Lives

Employers	Retirement	Disability	Survivor	Total	Annual Benefit
Biloxi	34	5	40	79	$1,973,214
Clarksdale	24	1	21	46	593,061
Clinton	27	0	5	32	917,050
Columbus	34	2	29	65	1,065,740
Greenville	32	0	28	60	831,300
Greenwood	25	0	23	48	707,701
Gulfport	41	8	29	78	1,747,664
Hattiesburg	90	6	39	135	3,289,229
Jackson	291	4	205	500	10,835,489
Laurel	43	2	22	67	906,768
McComb	10	1	6	17	264,388
Meridian	90	1	53	144	2,175,044
Natchez	20	3	16	39	602,950
Pascagoula	33	3	23	59	1,233,026
Tupelo	41	0	32	73	1,488,345
Vicksburg	27	2	29	58	2,017,147
Yazoo City	8	0	2	10	197,431
Total in MRS	870	38	602	1,510	$30,845,547

Section III - Computed Employer Contribution Rates

Mississippi Municipal Retirement Systems
Computed Employer Contribution Rates[1]
As of June 30, 2021 for the 2023 Fiscal Year End

Municipality	Certified Rate for Fiscal Year Ending 9/30/2022	Current Millage Rate for Fiscal Year Ending 9/30/2022	Calculated Rate for Fiscal Year Ending 9/30/2023	Certified Rate[2] for Fiscal Year Ending 9/30/2023
Biloxi	1.81	1.90	1.71	1.71
Clarksdale	5.38	5.38	4.72	4.72
Clinton	0.93	0.93	0.35	0.35
Columbus	5.35	5.35	5.09	5.09
Greenville	2.58	2.58	1.89	1.89
Greenwood	3.28	3.28	2.62	2.62
Gulfport	1.06	1.23	0.91	0.91
Hattiesburg	2.86	2.86	2.03	2.03
Jackson	3.79	3.79	2.65	2.65
Laurel	2.10	2.60	1.18	1.18
McComb	1.65	1.90	1.05	1.05
Meridian	2.02	2.50	1.18	1.18
Natchez	3.06	3.90	2.26	2.26
Pascagoula	1.57	1.57	1.07	1.07
Tupelo	1.53	1.61	1.24	1.24
Vicksburg	3.13	3.13	2.25	2.25
Yazoo City[3]	2.93	2.93	3.60	3.43

[1] Millage rates applied to assessed property

[2] Calculated using cash flow projections and 6.05% investment return assumption (see Schedule H)

[3] The certified rate for the 2023 fiscal year for Yazoo City is limited to the ½ millage increase limit per plan statutes

The Systems are funded through taxes levied on assessed properties located in the Municipalities.

Section III - Computed Employer Contribution Rates

Since the millage rates are developed assuming 0% annual growth in assessed property values in the future, the following table provides the recent history of assessed values as a guide to the appropriateness of that assumption.

Mississippi Municipal Retirement Systems
Total Assessed Property Values
Last Five Fiscal Years

Municipality	2016	2017	2018	2019	2020	Average % Increase
Biloxi	$574,544,932	$592,181,786	$579,988,410	$585,246,074	$593,305,051	0.8
Clarksdale	85,193,003	83,414,667	84,564,374	83,760,178	82,849,209	(0.7)
Clinton	208,729,466	207,772,348	215,682,895	216,824,192	215,400,746	0.8
Columbus	199,814,257	208,552,785	203,048,379	207,384,299	207,520,472	1.0
Greenville	198,785,980	193,778,841	198,137,988	201,216,099	205,375,459	0.8
Greenwood	110,569,319	113,719,820	115,001,002	115,862,323	106,864,240	(0.8)
Gulfport	737,909,261	749,196,904	761,757,224	805,811,344	816,814,675	2.6
Hattiesburg	437,346,637	470,026,110	467,912,761	473,044,936	482,280,326	2.5
Jackson	1,197,598,015	1,201,390,327	1,207,182,951	1,252,499,510	1,251,727,960	1.1
Laurel	166,322,618	180,736,668	182,758,430	188,151,450	197,898,826	4.4
McComb	100,951,928	102,003,113	102,851,829	106,190,926	102,885,698	0.5
Meridian	342,244,755	341,865,756	347,111,909	355,154,627	365,967,586	1.7
Natchez	139,808,455	153,395,477	128,903,757	124,775,441	133,225,319	(1.2)
Pascagoula	234,224,731	235,913,098	245,159,735	228,725,988	227,131,210	(0.8)
Tupelo	497,690,205	497,231,537	505,969,659	520,896,796	545,794,918	2.3
Vicksburg	326,807,260	327,183,714	322,506,308	288,172,230	308,408,615	(1.4)
Yazoo City	49,956,737	49,268,781	52,021,220	54,792,825	55,250,160	2.5

Section IV - Comments on Valuation

1. Based on the Board's funding policy, the millage rates established by the municipalities must be set at a level which will ensure actuarial soundness of the Systems. As can be seen from the table on page 5, the current millage rate for the fiscal year ending September 30, 2022 for one of the municipalities is less than the certified rate for the fiscal year ending September 30, 2023 under the funding policy. Therefore, Yazoo City needs to increase their millage rate to the certified millage rate for the fiscal year ending September 30, 2023.

2. As shown in the analysis of experience on pages 29 and 30, the System had an actuarial gain for the year. The gain was primarily due to the investment return on the assets for the year being more than expected. There were additional gains due to more deaths than expected for the year as well as the change in actuarial assumptions from the recommendations of the experience study for the 4-year period ending on June 30, 2020.

3. From 2019 to 2020, the value of assessed property increased for eleven and decreased for six of the seventeen municipalities. Under the funding policy, the value of assessed property is assumed to remain level. In general, if assessed property values grow, it contributes to a decrease in the millage rate.

Section V - 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, 2021

GROUP	NUMBER
Retired participants and beneficiaries currently receiving benefits	1,510
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	0
Inactive Participants	0
Active Participants	0
Total	1,510

Section V - Supplemental Disclosure Information

2. The actuarial accrued liability is as follows:

ACTUARIAL ACCRUED LIABILITY

Municipality	Actuarial Accrued Liability	Actuarial Value of Assets	Unfunded Actuarial Accrued Liability	Funded Ratio
Biloxi	$20,671,110	$8,378,358	$12,292,752	40.53%
Clarksdale	5,092,849	1,052,520	4,040,329	20.67%
Clinton	10,237,242	9,101,862	1,135,380	88.91%
Columbus	9,007,626	1,218,267	7,789,359	13.52%
Greenville	7,020,137	2,534,826	4,485,311	36.11%
Greenwood	5,855,399	2,593,523	3,261,876	44.29%
Gulfport	16,877,387	7,401,781	9,475,606	43.86%
Hattiesburg	33,086,450	19,902,137	13,184,313	60.15%
Jackson	89,616,360	47,481,374	42,134,986	52.98%
Laurel	8,281,691	4,839,715	3,441,976	58.44%
McComb	2,444,514	1,041,309	1,403,205	42.60%
Meridian	18,277,654	11,964,370	6,313,284	65.46%
Natchez	5,371,007	1,657,904	3,713,103	30.87%
Pascagoula	10,503,666	7,175,033	3,328,633	68.31%
Tupelo	12,667,226	4,790,130	7,877,096	37.82%
Vicksburg	17,588,815	8,941,839	8,646,976	50.84%
Yazoo City	1,826,849	183,397	1,643,452	10.04%
Totals	$274,425,982	$140,258,345	$134,167,637	51.11%

During the year ended June 30, 2021, the Systems experienced a net decrease of $12,010,457 in the actuarial accrued liability.

3. Another such item is the schedule of funding progress as shown below. As can be seen in column 3 of the table below, the funded ratio has begun to slowly improve in recent years. As this is a closed plan, the funded ratio should continue to increase to 100% when all the cities reach a pay-as-you-go status.

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)
09/30/12	$155,484	$356,571	43.6%	$201,087	$1,131	17,779.6%
06/30/13	153,241	349,588	43.8	196,347	794	24,728.8
06/30/14	157,970	340,385	46.4	182,415	727	25,091.5
06/30/15	162,616	341,525	47.6	178,909	579	30,899.7
06/30/16	159,160	330,663	48.1	171,503	419	40,931.5
06/30/17	157,674	321,747	49.0	164,073	321	51,113.1
06/30/18	154,749	307,457	50.3	152,707	200	76,354.0
06/30/19	147,671	296,006	49.9	148,335	95	156,142.1
06/30/20	140,731	286,436	49.1	145,705	N/A	N/A
06/30/21	140,258	274,426	51.1	134,168	N/A	N/A

Numbers shown above reflect all changes in benefit provisions, actuarial assumptions, and/or actuarial methods, if any.

History of Funding Progress

	Actuarial Value of Assets as Percentage of AAL									
Municipality	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Biloxi	39.41%	38.18%	39.49%	39.55%	40.41%	41.27%	44.17%	44.50%	42.30%	40.53%
Clarksdale	19.99	23.82	23.18	26.51	27.32	26.80	26.10	22.74	20.74	20.67
Clinton	75.02	74.38	79.09	82.74	84.38	87.19	87.20	87.00	87.03	88.91
Columbus	10.74	11.29	13.10	10.54	9.82	9.49	9.76	10.09	11.35	13.52
Greenville	34.25	34.11	36.12	36.64	35.56	35.41	34.58	34.19	32.93	36.11
Greenwood	34.72	35.05	36.61	38.27	39.47	40.56	41.40	41.18	40.60	44.29
Gulfport	46.37	45.03	46.99	47.63	47.01	47.60	48.56	49.64	46.86	43.86
Hattiesburg	54.17	53.82	56.90	58.53	58.29	58.68	59.86	58.67	58.27	60.15
Jackson	48.80	48.35	50.83	51.49	50.95	51.24	52.25	51.17	49.89	52.98
Laurel	26.79	29.51	33.03	36.20	40.17	40.07	43.23	45.54	48.56	58.44
McComb	27.48	25.52	24.99	25.49	25.94	27.40	30.28	31.83	32.85	42.60
Meridian	31.22	33.90	38.17	42.40	48.51	55.76	59.84	62.08	61.95	65.46
Natchez	28.55	30.03	30.21	29.61	30.24	29.45	27.79	30.54	29.98	30.87
Pascagoula	50.75	52.53	57.57	59.64	60.57	62.75	66.07	67.89	68.11	68.31
Tupelo	42.81	42.51	44.96	44.31	43.82	43.26	42.41	39.79	37.49	37.82
Vicksburg	47.83	49.26	52.08	53.82	53.77	53.02	53.64	49.63	50.22	50.84
Yazoo City	22.32	21.96	16.66	20.20	18.42	17.25	19.12	17.49	16.95	10.04

4. In determining the actuarially determined employer contribution for GASB purposes, the accrued liability amount is based on the amortization of the unfunded actuarial accrued liability over a closed period from the valuation date. The period as of June 30, 2021 is 13 years. The calculation of this amount is shown below.

2021/2022 FISCAL YEAR
ACTUARIALLY DETERMINED EMPLOYER CONTRIBUTION (ADEC)
BASED ON THE VALUATION AS OF JUNE 30, 2021

ACTUARIALLY DETERMINED EMPLOYER CONTRIBUTION (ADEC)	
Normal	$ 0
Accrued liability	16,557,357
Total	$ 16,557,357

5. Additional information as of June 30, 2021 follows.

Valuation date	6/30/2021
Actuarial cost method	Entry age
Amortization method	Level dollar, closed
Remaining amortization period	13 years
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return*	7.55%
*Includes price inflation at	2.40%
Cost of living adjustments	2.00% - 3.75% depending upon municipality

Schedule of Employer Contributions

Fiscal Year 10/1-9/30	Valuation date	Actuarially Determined Contribution	Percentage Contributed
2012-13	9/30/2012	$19,511,877	102.6%
2013-14	6/30/2013	19,343,836	105.4
2014-15	6/30/2014	18,337,572	105.5
2015-16	6/30/2015	18,034,182	102.8
2016-17	6/30/2016	17,693,519	100.2
2017-18	6/30/2017	17,393,028	101.2
2018-19	6/30/2018	16,694,899	102.5
2019-20	6/30/2019	16,777,608	99.0
2020-21	6/30/2020	17,118,242	N/A
2021-22	6/30/2021	16,557,357	N/A

Contributions Required and Contributions Made

Municipality	Actuarially Determined Contribution	Actual 2019 – 2020 Contribution	Percentage Contributed
Biloxi	$1,220,849	$1,181,694	96.8%
Clarksdale	488,689	419,051	85.8
Clinton	154,858	343,065	221.5
Columbus	988,138	1,140,811	115.5
Greenville	607,234	537,969	88.6
Greenwood	452,380	368,513	81.5
Gulfport	1,030,603	521,352	50.6
Hattiesburg	1,625,577	1,358,079	83.5
Jackson	5,506,705	5,114,519	92.9
Laurel	578,925	814,708	140.7
McComb	232,265	267,158	115.0
Meridian	862,363	982,674	114.0
Natchez	471,061	468,000	99.4
Pascagoula	393,262	726,862	184.8
Tupelo	889,931	837,487	94.1
Vicksburg	1,074,704	1,365,617	127.1
Yazoo City	200,064	166,020	83.0
Total	$ 16,777,608	$ 16,613,580	99.0%

Schedule of Active Member Valuation Data

		Active Members			
Valuation Date	Number of Employers	Number	Annual Payroll	Annual Average Pay	% Increase in Average Pay
9/30/12	17	21	$1,131,252	$53,869	(0.7)%
6/30/13	17	16	793,841	49,615	(7.9)
6/30/14	17	14	727,347	51,953	4.7
6/30/15	17	11	579,267	52,661	1.4
6/30/16	17	8	419,000	52,375	(0.5)
6/30/17	17	6	321,243	53,541	2.2
6/30/18	17	4	199,742	49,936	(6.7)
6/30/19	17	2	94,871	47,436	(5.0)
6/30/20	17	0	0	0	N/A
6/30/21	17	0	0	0	N/A

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

	Fiscal Year Ended September 30									
Item	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Beginning of Year	2,016	1,978	1,941	1,890	1,849	1,798	1,754	1,694	1,634	1,585
Added	39	40	29	40	46	34	36	37	34	34
Removed	(77)	(77)	(80)	(81)	(97)	(78)	(96)	(97)	(83)	(109)
End of Year	1,978	1,941	1,890	1,849	1,798	1,754	1,694	1,634	1,585	1,510

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

Schedule of Benefit Payments Added to and Removed From Rolls
Last Six Fiscal Years

Year Ending	2016	2017	2018	2019	2020	2021
Beginning of Year	$34,478,364	$34,088,404	$33,751,528	$32,997,690	$32,423,308	$31,819,367
Added	842,966	712,490	674,428	736,820	654,407	633,039
Removed	(1,365,194)	(1,174,872)	(1,530,600)	(1,441,224)	(1,386,860)	(1,724,751)
Benefit increase due to annual COLA	132,268	125,506	102,334	130,022	128,512	117,892
Benefit increase due to plan amendments	0	0	0	0	0	0
End of Year	$34,088,404	$33,751,528	$32,997,690	$32,423,308	$31,819,367	$30,845,547

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, 2020 to June 30, 2021									
Average Monthly Benefit	$0	$0	$0	$0	$0	$0	$0	$0	$0
Average Final Salary	$0	$0	$0	$0	$0	$0	$0	$0	$0
Number of Active Retirants	0	0	0	0	0	0	0	0	0
July 1, 2019 to June 30, 2020									
Average Monthly Benefit	$0	$0	$0	$0	$0	$0	$0	$3,024	$3,024
Average Final Salary	$0	$0	$0	$0	$0	$0	$0	$47,435	$47,435
Number of Active Retirants	0	0	0	0	0	0	0	2	2
July 1, 2018 to June 30, 2019									
Average Monthly Benefit	$0	$0	$0	$0	$0	$0	$0	$3,427	$3,427
Average Final Salary	$0	$0	$0	$0	$0	$0	$0	$53,998	$53,998
Number of Active Retirants	0	0	0	0	0	0	0	2	2
July 1, 2017 to June 30, 2018									
Average Monthly Benefit	$0	$0	$0	$0	$0	$0	$0	$3,738	$3,738
Average Final Salary	$0	$0	$0	$0	$0	$0	$0	$67,277	$67,277
Number of Active Retirants	0	0	0	0	0	0	0	2	2
July 1, 2016 to June 30, 2017									
Average Monthly Benefit	$0	$0	$0	$0	$0	$0	$0	$2,424	$2,424
Average Final Salary	$0	$0	$0	$0	$0	$0	$0	$43,631	$43,631
Number of Active Retirants	0	0	0	0	0	0	0	2	2
July 1, 2015 to June 30, 2016									
Average Monthly Benefit	$0	$0	$0	$0	$0	$0	$0	$3,479	$3,479
Average Final Salary	$0	$0	$0	$0	$0	$0	$0	$44,155	$44,155
Number of Active Retirants	0	0	0	0	0	0	0	3	3

Schedule A - Development of Actuarial Value of Assets

		6/30/2020	6/30/2021	6/30/2022	6/30/2023	6/30/2024	6/30/2025
A.	Actuarial Value Beginning of Year	$147,670,934	$140,731,034				
B.	Market Value End of Year	136,780,881	159,572,184				
C.	Market Value Beginning of Year	148,463,405	136,780,881				
D.	Cash Flow						
	D1. Contributions	16,621,094	14,906,920				
	D2. Other Revenue	0	0				
	D3. Benefit Payments	(32,169,935)	(31,335,975)				
	D4. Administrative Expenses	(331,418)	(298,991)				
	D5. Net	(15,880,259)	(16,728,046)				
E.	Investment Income						
	E1. Market Total: B.-C.-D5.	4,197,735	39,519,349				
	E2. Assumed Rate	7.75%	7.75%				
	E3. Amount for Immediate Recognition	10,890,554	9,952,306				
	E4. Amount for Phased-In Recognition	(6,692,819)	29,567,043				
F.	Phased-In Recognition of Investment Income						
	F1. Current Year: 0.20*E4.	(1,338,564)	5,913,409	0	0	0	0
	F2. First Prior Year	(199,247)	(1,338,564)	5,913,409	0	0	0
	F3. Second Prior Year	74,382	(199,247)	(1,338,564)	5,913,409	0	0
	F4. Third Prior Year	1,853,071	74,382	(199,247)	(1,338,564)	5,913,409	0
	F5. Fourth Prior Year	(2,339,837)	1,853,071	74,382	(199,247)	(1,338,564)	5,913,409
	F6. Total Recognized Investment Gain	(1,950,195)	6,303,051	4,449,980	4,375,598	4,574,845	5,913,409
G.	Adjustment:	0	0				
H.	Actuarial Value End of Year:						
	A.+D5.+E3.+F6.+G.	$140,731,034	$140,258,345				
I.	Difference Between Market & Actuarial Values	(3,950,153)	19,313,839	14,863,859	10,488,261	5,913,416	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 B - Statement of Actuarial Assumptions and Methods

INTEREST RATE:	7.55% per annum, compounded annually (net after investment expenses) for GASB disclosure.
	6.05% per annum, compounded annually (net after investment expenses) for employer contribution rate determination.
PRICE INFLATION:	2.40% per annum, compounded annually.

MARRIAGE ASSUMPTION: 85% married with the husband three years older than his wife.

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. Actuarial assets were allocated to individual cities in the same proportion that their market value of assets was to the total market value of assets for all cities.

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

Schedule C - Summary of Benefit Provisions Evaluated

The following summary presents the main provisions of the Systems in effect June 30, 2021, as interpreted in preparing the actuarial valuation. As used in the summary, “average compensation” means the average compensation of a member during the six month period prior to receipt of an allowance.

BENEFITS

Service Retirement

Condition for Retirement	A retirement allowance is payable to any member who retires and has completed at least 20 years of creditable service, regardless of age. Any general employee member who has attained age 70 and any fireman or policeman who has attained age 65 shall be retired forthwith.
Amount of Allowance	The annual retirement allowance payable to a retired member is equal to: 1. 50% of average compensation, plus 2. 1.7% of average compensation for each year of credited service over 20. The aggregate amount of (1) and (2) above shall not exceed 66-2/3% (87% for Clinton) of average compensation, regardless of service.

Disability Retirement

Condition for Retirement	A retirement allowance is payable to any member who is not eligible for a service retirement benefit but who becomes totally and permanently disabled, either physically or mentally, regardless of creditable service, if the disability is due to causes in the performance of duty. If the disability is not in the performance of duty, the member must have completed at least 5 years of creditable service to be eligible for retirement.

Amount of Allowance	The annual disability retirement allowance payable is equal to 50% of his salary at the time of retirement, if the disability is due to causes in the performance of duty. If the disability is not in the performance of duty, the allowance is equal to 2.5% times credited service, not in excess of 20, times his salary at the time of retirement for firemen and policemen, and average compensation for general employees.

Death Benefit

Conditions for Benefit	A benefit is payable upon the death of a member under the following conditions: (a) the member has retired, (b) the member is eligible to retire, (c) the death is in the line of duty, or (d) the death is not in the line of duty, but occurs after the member has 5 years of credited service. The benefit is payable to the surviving spouse until remarriage and to children under age 18, to dependent children through age 23 when full time students, and to dependent children of any age if handicapped. For Clarksdale, Columbus, Gulfport, Hattiesburg, Jackson, McComb, Meridian, Vicksburg and Yazoo City, benefits payable to spouses do not cease upon remarriage.
Amount of Benefit	The annual benefit payable under all conditions in the case of firemen and policemen and under other than condition (c) in the case of general employees is equal to 2.5% of average compensation for each year of credited service up to 20 and 1.7% of average compensation for each year over 20, with a maximum benefit of 66-2/3% (87% for Clinton) of average compensation. For general employee members under condition (c), the annual benefit payable is equal to 50% of salary at the time of death.
Return of Contributions	Upon a member's termination of employment for any reason before retirement, his accumulated contributions are refunded. Upon the death of a member who is not eligible for any other death benefit, his accumulated contributions are paid to his beneficiary.

Minimum Allowances

The minimum monthly allowance paid to members from the following municipalities, for all retirement and death benefits, are:

Biloxi:	$600
Columbus:	$500
Gulfport:	$500
Hattiesburg:	$750
Jackson:	$500
Meridian:	$600
Tupelo:	$750
Vicksburg:	$1,515

Post-Retirement Adjustments In Allowances

The allowances of certain retired members are adjusted annually by a cost-of-living adjustment (COLA) on the basis of the annual percentage change in each fiscal year of the Consumer Price Index.

Those adjustments are limited as follows:

Biloxi: 3% per year for each full fiscal year of retirement after June 30, 2000 for all retirees and beneficiaries with the COLA being compounded beginning with the state fiscal year in which the retired member turns age 55. This is in addition to the previously granted maximum of 3% per year (not to exceed 9%) for all members who retired on or before December 31, 1995.

Clarksdale: Maximum of 2-1/2% per year for all retirees and beneficiaries.

Clinton: Maximum of 2-1/2% per year (not to exceed 10%) for service retirements only.

Columbus: Maximum of 2-1/2% per year (not to exceed 25%) for all retirees and beneficiaries.

Greenville: Maximum of 2-1/2% per year (not to exceed 25%) for all retirees and beneficiaries.

Gulfport: Maximum of 3% per year (not to exceed 27%) for each fiscal year of retirement after June 30, 2002 for all retirees and beneficiaries. This is in addition to the previously granted COLA of 2% per year (not to exceed 6%) for those retired before July 1, 2001. All Gulfport retirees and beneficiaries who were receiving a retirement allowance as of June 30, 2002 were granted a monthly ad-hoc benefit increase of $2 per month for each year of service plus $2 per month for each full fiscal year retired.

Hattiesburg: 2-1/2% per year for all retirees and beneficiaries (not to exceed 32%).

Jackson: Maximum aggregate increase of 19.5% for service and disability retirements only.
Laurel: 2% per year, compounded annually (maximum of 3 years) for each fiscal year of retirement after June 30, 2002 for all retirees and beneficiaries. COLA increases begin at the later of age 60 or after one full fiscal year of retirement.

McComb: Maximum of 2-1/2% per year for all retirees and beneficiaries (not to exceed 10%).

Meridian: All retirees and beneficiaries who were receiving a retirement allowance as of June 30, 1999 were granted a 3.9% ad-hoc benefit increase.

Pascagoula: Maximum of 2-1/2% per year for all retirees and beneficiaries (not to exceed 15%).

Tupelo: All retirees and beneficiaries received an increase of 5% in allowances effective December 1, 1991. Additional 3% ad-hoc benefit increases were granted to members who were retired for at least one full fiscal year as of September 30, 1995, as of September 30, 1997, as of September 30, 1998, and as of September 30, 2000. Furthermore, a 2% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 1999 and a 2.34% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2001. Furthermore, a 2% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2010. Furthermore, a 2% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2014. Furthermore, a 3% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2015. Furthermore, a 3% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2016. Furthermore, a 2% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2017. Furthermore, a 3% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2018. Furthermore, a 3% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2019.

Furthermore, a 1% ad-hoc benefit increase was granted to members who were retired for at least one full fiscal year as of September 30, 2020.

Vicksburg: 3% per year for all retirees and beneficiaries.

Yazoo City: Maximum of 2-1/2% per year (not to exceed 25%) for all retirees and beneficiaries.

Post-retirement adjustments are included in System liabilities for future increases for Biloxi, Clinton, Columbus, Greenville, Gulfport, Hattiesburg, Jackson, Laurel, McComb, Pascagoula, Vicksburg, and Yazoo City.

Schedule D - Detailed Tabulations of Data

RECONCILIATION OF DATA RECEIVED FROM PERS

Reconciliation of Data received from PERS	Pensioner File			Total
	Retirees	Disableds	Survivors	
From PERS	920	46	650	1,616
Refunded				
Deceased	(51)	(8)	(48)	(107)
Retired				
Added	1			1
For Valuation	870	38	602	1,510

STATUS RECONCILIATION FROM 2020 TO 2021

	Retirees	Disability	Survivor	Total
As of June 30, 2020	923	46	616	1,585
Retirements				
Disabilities				
Death with Survivors	(28)	(5)	34	1
Deaths with no Survivors	(25)	(3)	(48)	(76)
Benefits Expired				
Data Corrections				
As of June 30, 2021	870	38	602	1,510

Retirants & Beneficiaries as of June 30, 2021

Tabulated by Year of Retirement

Year of Retirement	No.	Annual Benefits excluding COLA	COLA	Total Annual Benefits	Average Monthly Benefit
2021	0	$ 0	$ 0	$ 0	$ 0
2020	2	72,566	0	72,566	3,024
2019	3	96,451	2,056	98,507	2,736
2018	1	43,396	0	43,396	3,616
2017	2	76,266	2,711	78,977	3,291
2016	4	153,667	10,043	163,710	3,411
2015	1	25,335	0	25,335	2,111
2014	3	111,086	10,107	121,193	3,366
2013	9	364,151	48,804	412,955	3,824
2012	4	164,423	32,477	196,900	4,102
2011	0	0	0	0	0
2010	5	156,183	36,699	192,882	3,215
2009	3	79,418	6,048	85,466	2,374
2008	5	132,896	18,970	151,866	2,531
2007	7	224,464	65,006	289,470	3,446
2006	14	371,190	70,279	441,469	2,628
2005	27	708,241	138,081	846,322	2,612
2004	19	440,730	99,760	540,490	2,371
2003	31	811,542	197,505	1,009,047	2,712
2002	40	1,115,573	281,764	1,397,337	2,911
2001	23	658,626	142,996	801,622	2,904
2000	34	860,699	221,446	1,082,145	2,652
1999	34	815,678	187,485	1,003,163	2,459
1998	37	885,449	189,741	1,075,190	2,422
1997	51	1,105,955	202,123	1,308,078	2,137
1996	55	1,083,814	175,950	1,259,764	1,909
1995	98	1,709,156	280,782	1,989,938	1,692
1994	128	2,218,865	440,011	2,658,876	1,731
1993	89	1,508,111	315,512	1,823,623	1,708
1992	80	1,344,173	264,684	1,608,857	1,676
1991	70	1,184,473	201,135	1,385,608	1,650
1990	56	834,179	128,711	962,890	1,433
1989	41	560,018	125,545	685,563	1,393
1988	71	1,036,541	212,636	1,249,177	1,466
1987 & Prior	463	4,619,665	1,163,500	5,783,165	1,041
Totals	1,510	$ 25,572,980	$ 5,272,567	$ 30,845,547	$ 1,702

Schedule of Retired Members by Type of Benefit

Benefits Payable June 30, 2021

Amount of Monthly Benefit	Number of Rets.	Ret. Type 1*	Ret. Type 2*	Ret. Type 3*
$1 - $300	8	1	1	6
301 - 600	60	10	2	48
601 - 900	166	60	10	96
901 - 1,200	296	129	16	151
1,201 - 1,500	194	120	7	67
1,501 - 1,800	219	141		78
1,801 - 2,100	141	100		41
2,101 - 2,400	137	97		40
2,401 - 2,700	77	56	1	20
Over 2,700	212	156	1	55
Totals	1,510	870	38	602

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

Retirant and Beneficiary Information June 30, 2021

Tabulated by Attained Ages

	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Total	
Attained Age	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 45								
45 – 49					1	$22,130	1	$22,130
50 – 54					2	30,569	2	30,569
55 – 59	12	$390,090			5	111,924	17	502,014
60 – 64	31	914,990			26	515,941	57	1,430,931
65 – 69	113	3,042,033	6	$83,631	48	951,233	167	4,076,897
70 – 74	272	6,590,862	11	153,717	103	1,994,270	386	8,738,849
75 – 79	181	3,981,061	6	64,108	138	2,443,281	325	6,488,450
80 – 84	138	2,801,299	11	141,146	130	2,215,995	279	5,158,440
85 – 89	83	1,589,553	3	25,574	89	1,361,575	175	2,976,702
90 – 94	37	623,797			51	688,164	88	1,311,961
95	1	6,402			3	22,955	4	29,357
96	1	2,826			3	33,936	4	36,762
97	1	11,027			1	6,402	2	17,429
98					1	7,500	1	7,500
99			1	10,777			1	10,777
100 & Over					1	6,779	1	6,779
Totals	870	$19,953,940	38	$478,953	602	$10,412,654	1,510	$30,845,547

Schedule E - Analysis of Financial Experience

Actual experience will never (except by coincidence) coincide 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. Detail on the derivation of the experience gain/(loss) for the year ended June 30, 2021 is shown below.

		$ Thousands
(1)	UAAL* as of beginning of year	$ 145,705.4
(2)	Total normal cost from last valuation	0
(3)	Total contributions**	14,607.9
(4)	Interest accrual: {[(1) + (2)] x .0775} – [(3) x .03803]	10,736.7
(5)	Expected UAAL before changes: (1) + (2) – (3) + (4)	$ 141,834.2
(6)	Change due to plan amendments	120.6
(7)	Change due to new actuarial assumptions or methods	(3,057.7)
(8)	Expected UAAL after changes: (5) + (6) + (7)	$ 138,897.1
(9)	Actual UAAL as of end of year	$ 134,167.6
(10)	Gain/(loss): (8) – (9)	$ 4,729.5

*Unfunded actuarial accrued liability.

**Net of administrative expenses.

Schedule E - Analysis of Financial Experience

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

Type of Activity	$ Gain (or Loss) For Year Ending 6/30/2021	$ Gain (or Loss) For Year Ending 6/30/2020
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	$ 0.0	$ (105.1)
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	0.0	0.0
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	0.0	0.6
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	0.0	0.0
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	0.0	0.0
Investment Income. If there is greater investment income than assumed, there is a gain. If less income, a loss.	5,984.8	(1,900.3)
Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.	3,928.4	1,845.0
Other. Miscellaneous gains and losses resulting from data adjustments, software programming, COLAs, etc.	(5,183.7)	(176.8)
Gain (or Loss) During Year From Financial Experience	**$4,729.5**	**$(336.6)**
Non-Recurring Items. Adjustments for plan amendments, assumption changes, or method changes.	2,937.1	(2,438.7)
Composite Gain (or Loss) During Year	$7,666.6	$(2,775.3)

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 an 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. Sometimes referred to as “unfunded accrued liability”.

Valuation Assets. The value of current plan assets recognized for valuation purposes. Generally based on a market-related smoothing method.

Schedule G - The Nature of Actuarial Projections

Regular actuarial valuations measure the Retirement System's present financial position and contributions adequacy by calculating and financing the liabilities created by the present benefit program. This process involves discounting to present values the future benefit payments on behalf of present active and retired members and their survivors. However, valuations do not produce information regarding future changes in the makeup of the covered group or the amounts of benefits to be paid or investment income to be received – actuarial projections do.

Whereas valuations provide a snapshot of the retirement system as of a given date, projections provide a moving picture. Projected active and retired groups are developed from year to year by the application of assumptions regarding pre-retirement withdrawal from service, retirement, deaths and disabilities. Projected information regarding the retired life group leads to assumed future benefit payout. Combining future benefit payments with assumed contributions and expected investment earnings produces the net cash flow of the System each year, and thus end of year asset levels.

Projections are used for many purposes. Among them are (i) developing cash flow patterns for investment policy and asset mix consideration, (ii) exploring the effect of alternative assumptions about future experience, (iii) analyzing the impact on system funding progress of changes in the workforce, and (iv) examining the potential effect of changes in benefits on system financial activity.

Projection results are useful in demonstrating changing relationships among key elements affecting system financial activity. For example: how benefits payable and system assets will grow in future decades. Projections are not predictions of specific future events and do not provide numeric precision in absolute terms. For instance, cash flow projected to occur 10 years in the future will not be exact (except by coincidence), but understanding the changed relationships between future benefit payout and future investment income can be very useful.

Schedule H - Cash Flow Projections Based on Funding Policy

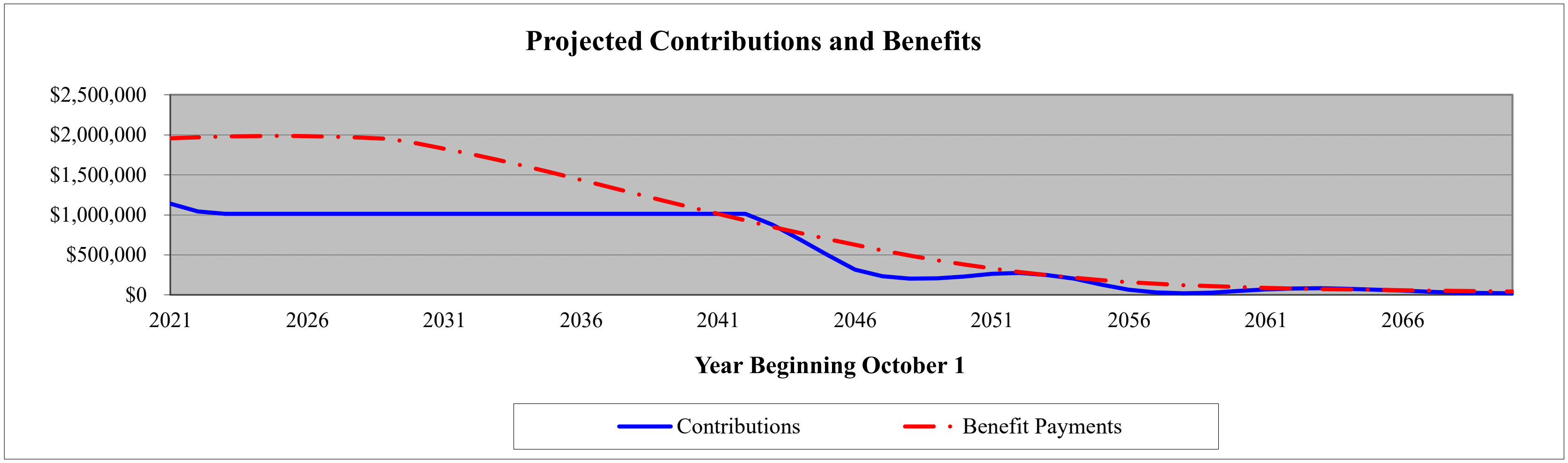
Mississippi Municipal Retirement Systems
City of Biloxi

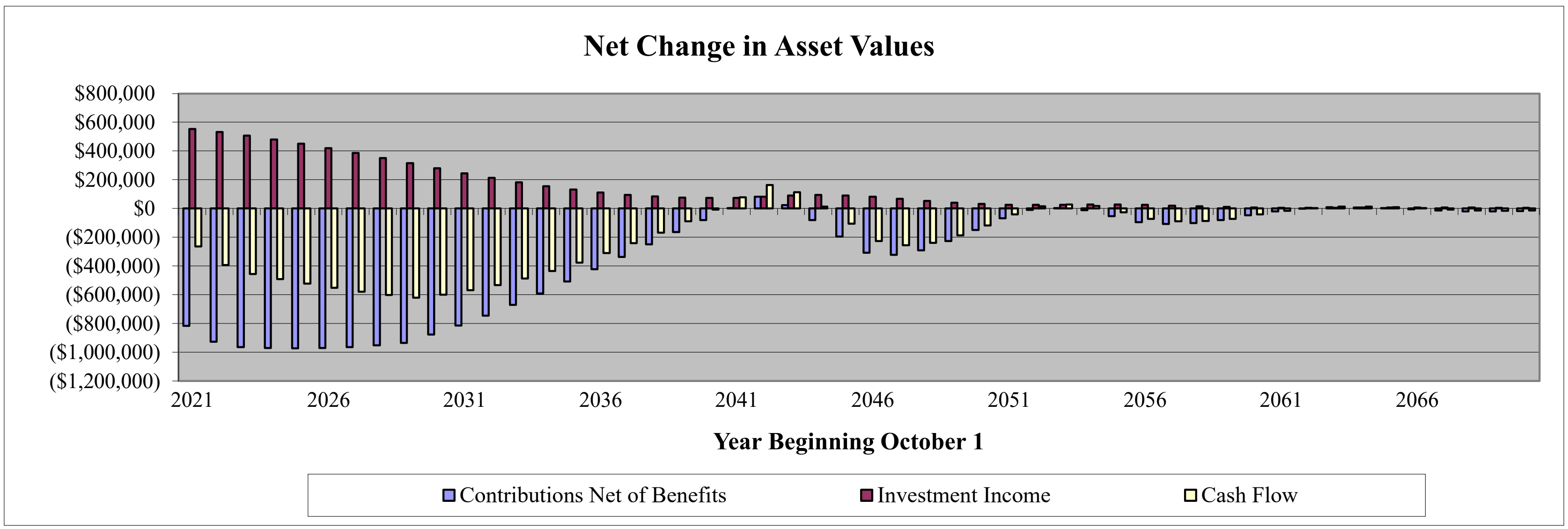
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$593,305,051	$9,532,074	0.00171	$1,141,009	$1,957,285	$552,361	($263,915)	$9,268,159	2022
2022	593,305,051	9,268,159	0.00171	1,042,734	1,970,234	533,079	(394,421)	8,873,738	2023
2023	593,305,051	8,873,738	0.00171	1,014,552	1,979,934	508,087	(457,295)	8,416,443	2024
2024	593,305,051	8,416,443	0.00171	1,014,552	1,986,015	480,240	(491,223)	7,925,220	2025
2025	593,305,051	7,925,220	0.00171	1,014,552	1,988,112	450,458	(523,102)	7,402,118	2026
2026	593,305,051	7,402,118	0.00171	1,014,552	1,985,911	418,876	(552,483)	6,849,635	2027
2027	593,305,051	6,849,635	0.00171	1,014,552	1,979,113	385,653	(578,908)	6,270,727	2028
2028	593,305,051	6,270,727	0.00171	1,014,552	1,967,377	350,979	(601,846)	5,668,880	2029
2029	593,305,051	5,668,880	0.00171	1,014,552	1,950,440	315,072	(620,816)	5,048,065	2030
2030	593,305,051	5,048,065	0.00171	1,014,552	1,893,109	279,222	(599,335)	4,448,730	2031
2035	593,305,051	2,421,570	0.00171	1,014,552	1,521,975	131,381	(376,042)	2,045,528	2036
2040	593,305,051	1,235,660	0.00171	1,014,552	1,095,099	72,357	(8,190)	1,227,470	2041
2045	593,305,051	1,593,630	0.00118	501,294	697,324	90,572	(105,458)	1,488,172	2046
2050	593,305,051	580,223	0.00064	230,039	379,306	30,654	(118,613)	461,610	2051
2055	593,305,051	478,923	0.00031	130,044	184,199	27,361	(26,794)	452,130	2056
2060	593,305,051	131,891	0.00016	49,241	97,566	6,539	(41,786)	90,105	2061
2065	593,305,051	103,425	0.00011	64,397	62,797	6,305	7,905	111,330	2066
2070	593,305,051	73,906	0.00007	21,499	40,543	3,904	(15,140)	58,766	2071

Mississippi Municipal Retirement Systems
City of Biloxi

50 Year Cash Flow Projection
Based on Valuation Assumptions





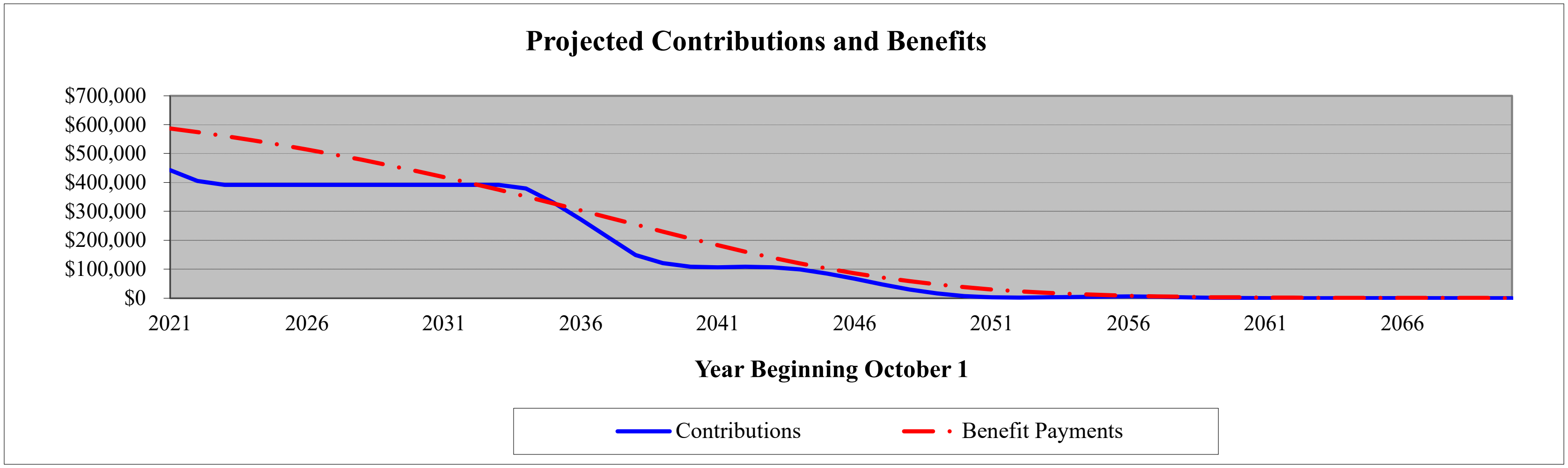
Mississippi Municipal Retirement Systems
City of Clarksdale

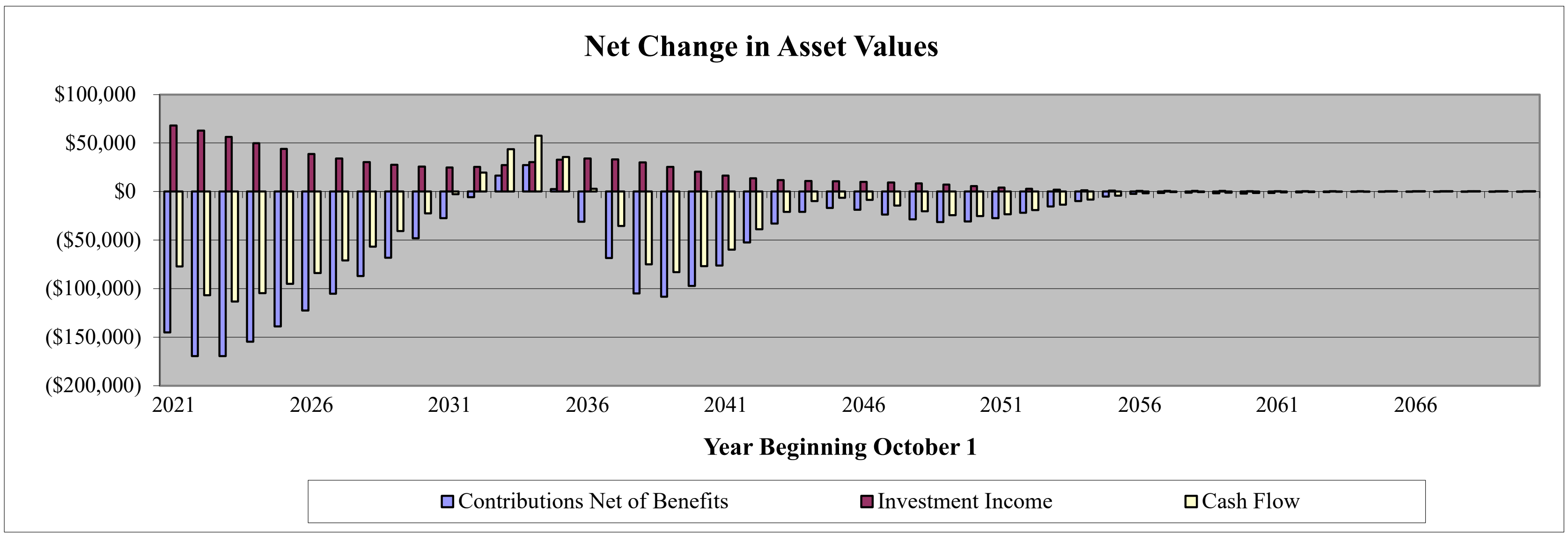
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$82,849,209	$1,197,454	0.00472	$442,138	$587,322	$68,119	($77,065)	$1,120,389	2022
2022	82,849,209	1,120,389	0.00472	404,718	574,373	62,727	(106,928)	1,013,461	2023
2023	82,849,209	1,013,461	0.00472	391,048	560,494	56,264	(113,182)	900,279	2024
2024	82,849,209	900,279	0.00472	391,048	545,728	49,857	(104,823)	795,456	2025
2025	82,849,209	795,456	0.00472	391,048	530,109	43,980	(95,081)	700,375	2026
2026	82,849,209	700,375	0.00472	391,048	513,653	38,718	(83,887)	616,489	2027
2027	82,849,209	616,489	0.00472	391,048	496,357	34,159	(71,150)	545,338	2028
2028	82,849,209	545,338	0.00472	391,048	478,211	30,395	(56,768)	488,570	2029
2029	82,849,209	488,570	0.00472	391,048	459,209	27,527	(40,634)	447,936	2030
2030	82,849,209	447,936	0.00472	391,048	439,343	25,661	(22,634)	425,302	2031
2035	82,849,209	543,331	0.00395	330,207	327,569	32,950	35,588	578,920	2036
2040	82,849,209	387,971	0.00248	108,331	205,640	20,572	(76,737)	311,234	2041
2045	82,849,209	181,739	0.00122	84,667	101,461	10,495	(6,299)	175,440	2046
2050	82,849,209	107,463	0.00045	6,565	37,556	5,578	(25,413)	82,050	2051
2055	82,849,209	17,761	0.00012	4,881	10,177	917	(4,379)	13,382	2056
2060	82,849,209	9,091	0.00002	0	2,007	490	(1,517)	7,574	2061
2065	82,849,209	5,711	0.00000	0	249	338	89	5,800	2066
2070	82,849,209	6,964	0.00000	0	15	421	406	7,370	2071

Mississippi Municipal Retirement Systems
City of Clarksdale

50 Year Cash Flow Projection
Based on Valuation Assumptions





Mississippi Municipal Retirement Systems
City of Clinton

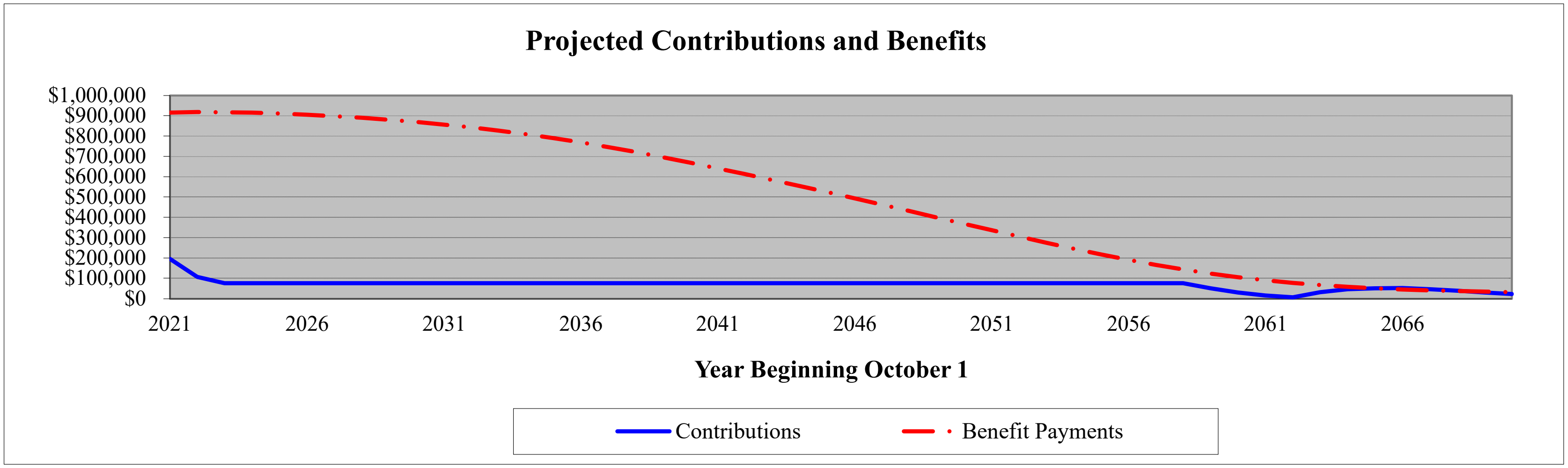
Cash Flow Projection

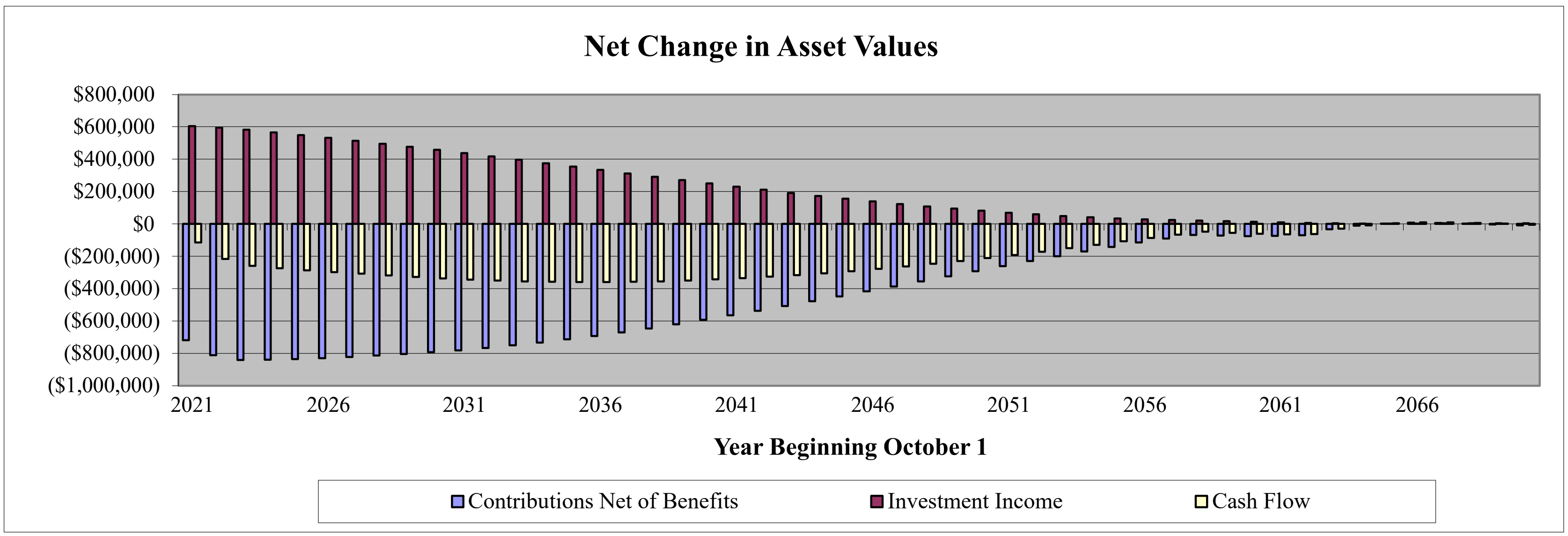
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$215,400,746	$10,355,205	0.00035	$196,317	$915,839	$605,044	($114,478)	$10,240,728	2022
2022	215,400,746	10,240,728	0.00035	106,623	918,166	595,375	(216,168)	10,024,559	2023
2023	215,400,746	10,024,559	0.00035	75,390	917,029	581,400	(260,239)	9,764,320	2024
2024	215,400,746	9,764,320	0.00035	75,390	914,975	565,717	(273,868)	9,490,452	2025
2025	215,400,746	9,490,452	0.00035	75,390	910,978	549,267	(286,321)	9,204,131	2026
2026	215,400,746	9,204,131	0.00035	75,390	904,964	532,124	(297,450)	8,906,680	2027
2027	215,400,746	8,906,680	0.00035	75,390	897,918	514,338	(308,190)	8,598,491	2028
2028	215,400,746	8,598,491	0.00035	75,390	889,716	495,937	(318,389)	8,280,102	2029
2029	215,400,746	8,280,102	0.00035	75,390	880,221	476,958	(327,873)	7,952,230	2030
2030	215,400,746	7,952,230	0.00035	75,390	869,294	457,447	(336,457)	7,615,772	2031
2035	215,400,746	6,208,149	0.00035	75,390	789,764	354,300	(360,074)	5,848,075	2036
2040	215,400,746	4,424,387	0.00035	75,390	669,089	249,980	(343,719)	4,080,668	2041
2045	215,400,746	2,796,595	0.00035	75,390	523,444	155,839	(292,215)	2,504,380	2046
2050	215,400,746	1,485,754	0.00035	75,390	367,900	81,170	(211,340)	1,274,414	2051
2055	215,400,746	631,415	0.00035	75,390	217,146	33,975	(107,781)	523,634	2056
2060	215,400,746	268,062	0.00035	29,966	104,990	13,982	(61,042)	207,020	2061
2065	215,400,746	40,334	0.00023	51,266	50,404	2,466	3,328	43,662	2066
2070	215,400,746	68,543	0.00015	22,553	31,449	3,882	(5,014)	63,529	2071

Mississippi Municipal Retirement Systems
City of Clinton

50 Year Cash Flow Projection
Based on Valuation Assumptions





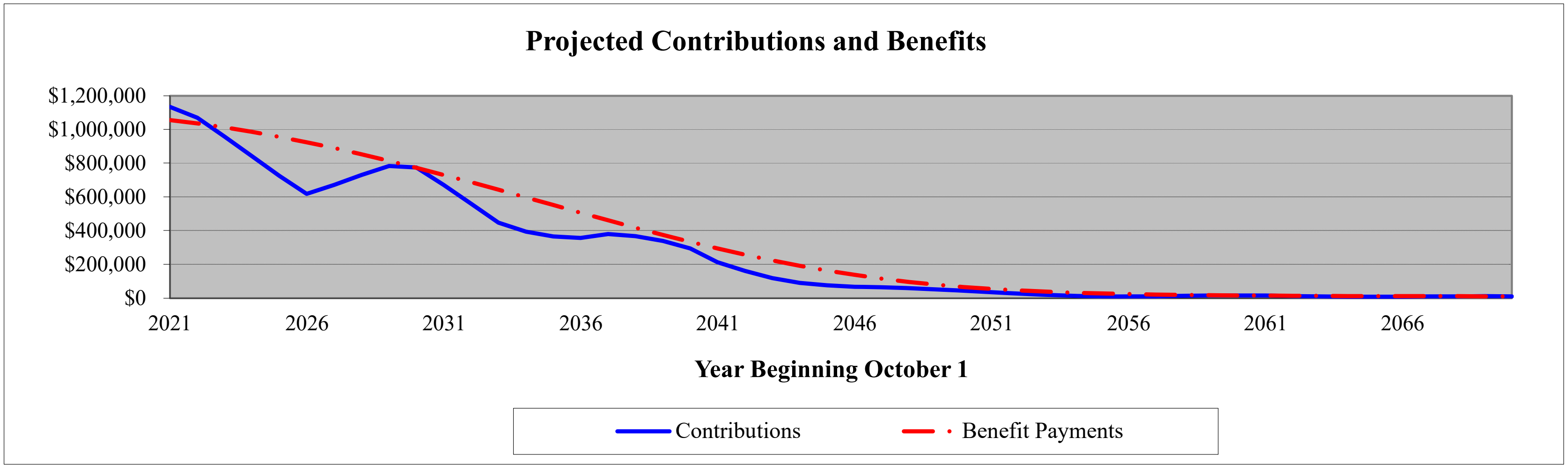
Mississippi Municipal Retirement Systems
City of Columbus

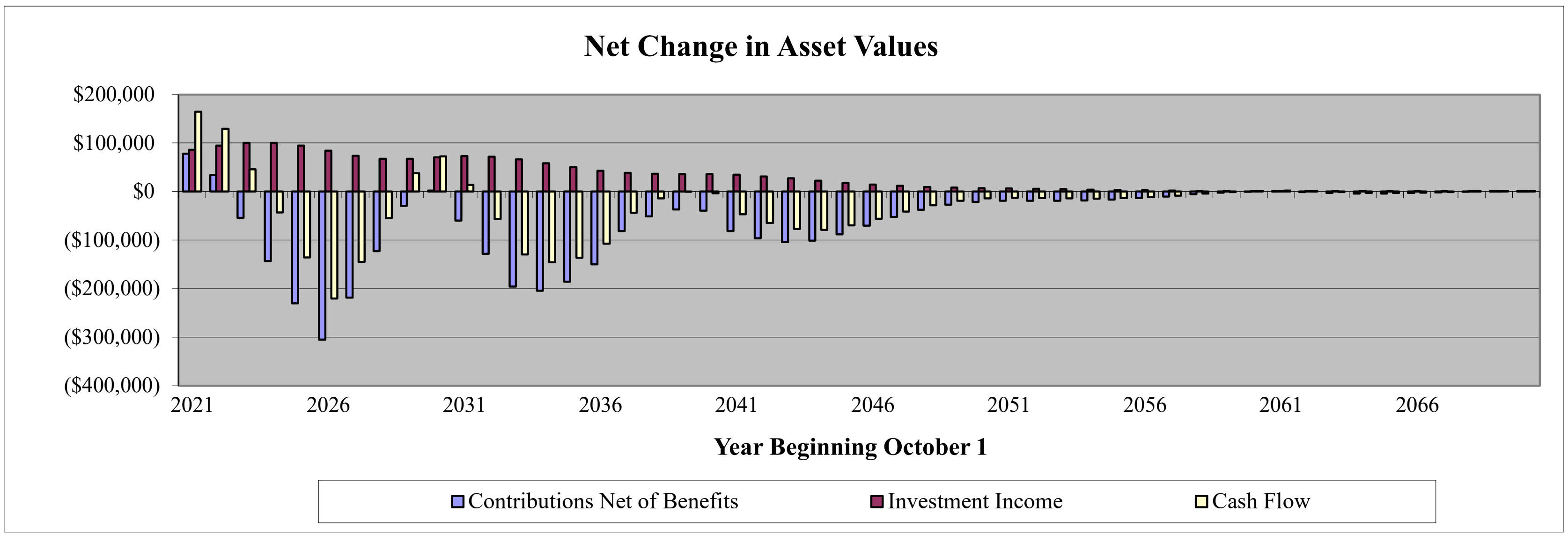
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$207,520,472	$1,386,025	0.00509	$1,134,420	$1,056,383	$86,180	$164,217	$1,550,242	2022
2022	207,520,472	1,550,242	0.00499	1,069,768	1,035,627	94,807	128,948	1,679,190	2023
2023	207,520,472	1,679,190	0.00488	957,362	1,011,767	99,969	45,564	1,724,753	2024
2024	207,520,472	1,724,753	0.00475	841,833	984,986	100,081	(43,072)	1,681,682	2025
2025	207,520,472	1,681,682	0.00460	725,010	955,504	94,872	(135,622)	1,546,060	2026
2026	207,520,472	1,546,060	0.00445	618,389	923,547	84,441	(220,717)	1,325,343	2027
2027	207,520,472	1,325,343	0.00429	670,479	889,324	73,660	(145,185)	1,180,158	2028
2028	207,520,472	1,180,158	0.00411	729,294	852,135	67,738	(55,103)	1,125,055	2029
2029	207,520,472	1,125,055	0.00392	783,618	812,939	67,192	37,871	1,162,926	2030
2030	207,520,472	1,162,926	0.00372	773,886	772,114	70,410	72,182	1,235,109	2031
2035	207,520,472	916,423	0.00266	365,555	551,699	49,895	(136,249)	780,174	2036
2040	207,520,472	614,220	0.00160	293,477	333,067	35,980	(3,610)	610,609	2041
2045	207,520,472	342,730	0.00078	74,339	162,314	18,113	(69,862)	272,868	2046
2050	207,520,472	128,754	0.00031	43,875	65,321	7,150	(14,296)	114,459	2051
2055	207,520,472	58,994	0.00013	9,913	26,572	3,073	(13,586)	45,408	2056
2060	207,520,472	20,182	0.00007	14,922	14,954	1,220	1,188	21,370	2061
2065	207,520,472	19,064	0.00006	7,414	11,606	1,028	(3,164)	15,900	2066
2070	207,520,472	14,309	0.00005	10,263	9,821	879	1,321	15,630	2071

Mississippi Municipal Retirement Systems
City of Columbus

50 Year Cash Flow Projection
Based on Valuation Assumptions





Mississippi Municipal Retirement Systems
City of Greenville

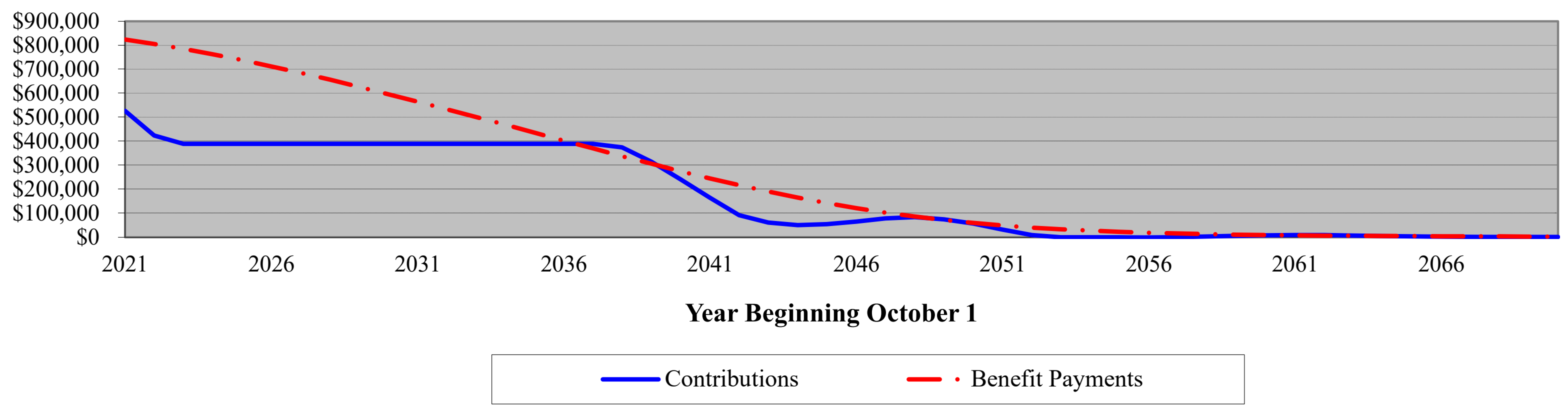
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$205,375,459	$2,883,876	0.00189	$526,683	$823,298	$165,634	($130,981)	$2,752,896	2022
2022	205,375,459	2,752,896	0.00189	423,587	804,873	155,186	(226,100)	2,526,796	2023
2023	205,375,459	2,526,796	0.00189	388,160	784,392	141,061	(255,171)	2,271,624	2024
2024	205,375,459	2,271,624	0.00189	388,160	761,977	126,291	(247,526)	2,024,098	2025
2025	205,375,459	2,024,098	0.00189	388,160	737,772	112,037	(237,575)	1,786,523	2026
2026	205,375,459	1,786,523	0.00189	388,160	711,937	98,434	(225,343)	1,561,180	2027
2027	205,375,459	1,561,180	0.00189	388,160	684,645	85,614	(210,871)	1,350,309	2028
2028	205,375,459	1,350,309	0.00189	388,160	656,089	73,708	(194,221)	1,156,088	2029
2029	205,375,459	1,156,088	0.00189	388,160	626,458	62,841	(175,457)	980,631	2030
2030	205,375,459	980,631	0.00189	388,160	595,931	53,135	(154,636)	825,994	2031
2035	205,375,459	455,544	0.00189	388,160	435,100	26,161	(20,779)	434,765	2036
2040	205,375,459	602,852	0.00134	240,333	274,427	35,456	1,362	604,214	2041
2045	205,375,459	262,252	0.00069	54,143	141,278	13,269	(73,866)	188,386	2046
2050	205,375,459	142,000	0.00029	56,526	58,645	8,528	6,409	148,409	2051
2055	205,375,459	67,569	0.00011	0	21,625	3,443	(18,182)	49,387	2056
2060	205,375,459	7,693	0.00004	7,232	8,677	422	(1,023)	6,671	2061
2065	205,375,459	11,093	0.00002	2,803	4,113	632	(678)	10,415	2066
2070	205,375,459	2,974	0.00001	599	1,785	145	(1,041)	1,933	2071

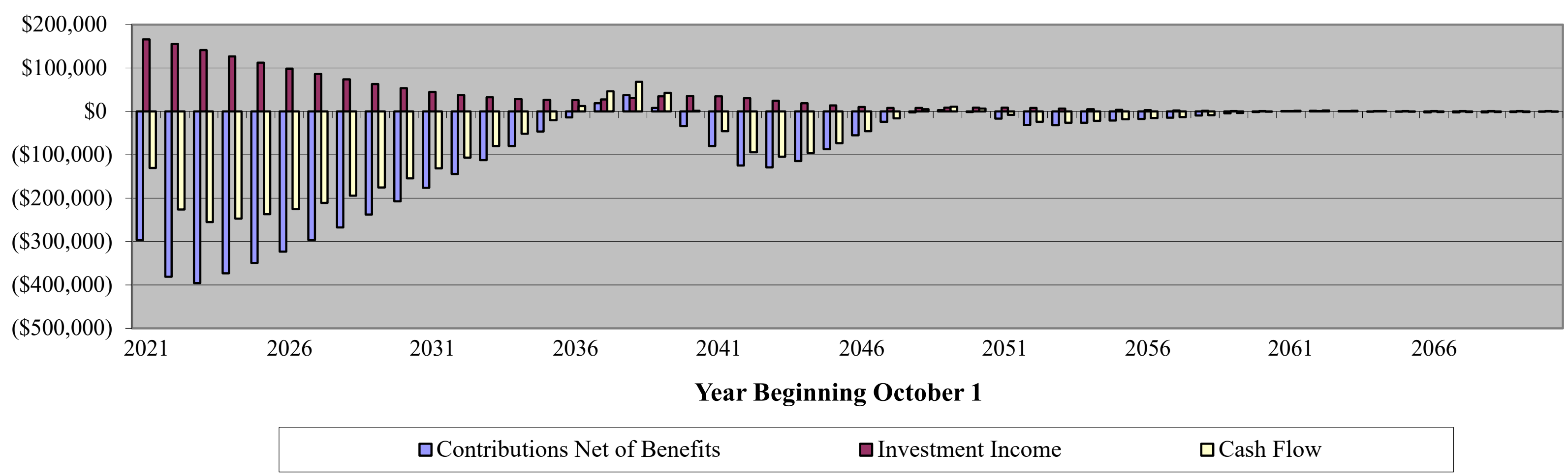
Mississippi Municipal Retirement Systems
City of Greenville

50 Year Cash Flow Projection
Based on Valuation Assumptions

Projected Contributions and Benefits



Net Change in Asset Values



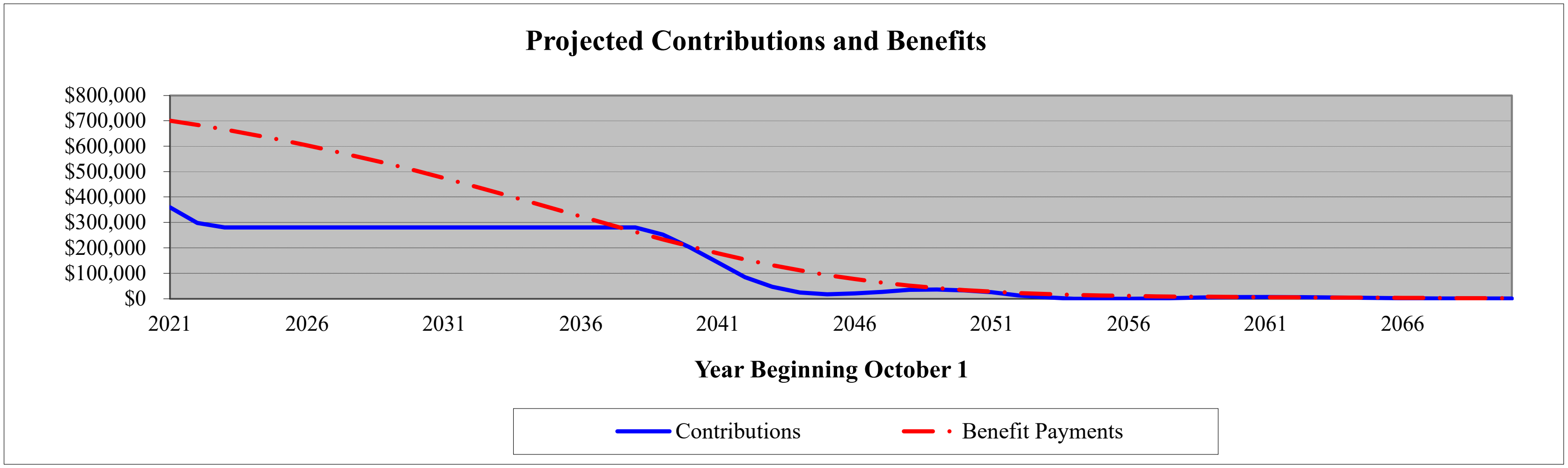
Mississippi Municipal Retirement Systems
City of Greenwood

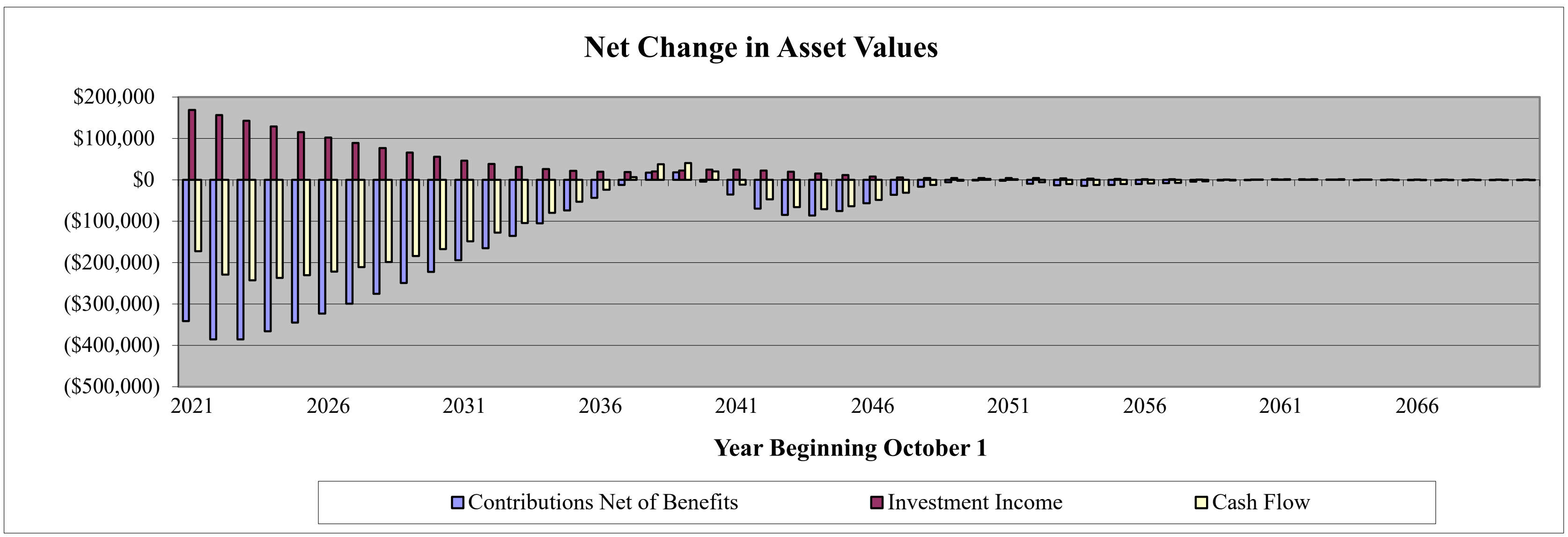
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$106,864,240	$2,950,656	0.00262	$359,052	$700,327	$168,343	($172,932)	$2,777,724	2022
2022	106,864,240	2,777,724	0.00262	297,617	683,595	156,548	(229,430)	2,548,295	2023
2023	106,864,240	2,548,295	0.00262	279,984	665,486	142,682	(242,820)	2,305,475	2024
2024	106,864,240	2,305,475	0.00262	279,984	646,037	128,571	(237,482)	2,067,993	2025
2025	106,864,240	2,067,993	0.00262	279,984	625,278	114,822	(230,472)	1,837,521	2026
2026	106,864,240	1,837,521	0.00262	279,984	603,240	101,535	(221,721)	1,615,801	2027
2027	106,864,240	1,615,801	0.00262	279,984	579,951	88,815	(211,152)	1,404,649	2028
2028	106,864,240	1,404,649	0.00262	279,984	555,430	76,771	(198,675)	1,205,973	2029
2029	106,864,240	1,205,973	0.00262	279,984	529,696	65,519	(184,193)	1,021,780	2030
2030	106,864,240	1,021,780	0.00262	279,984	502,785	55,177	(167,624)	854,157	2031
2035	106,864,240	392,218	0.00262	279,984	354,499	21,508	(53,007)	339,210	2036
2040	106,864,240	398,360	0.00192	200,860	205,221	23,971	19,610	417,970	2041
2045	106,864,240	221,412	0.00087	17,311	92,727	11,148	(64,268)	157,143	2046
2050	106,864,240	62,157	0.00032	32,087	33,687	3,713	2,113	64,271	2051
2055	106,864,240	36,995	0.00012	0	12,359	1,870	(10,489)	26,506	2056
2060	106,864,240	3,976	0.00006	6,050	6,076	240	214	4,190	2061
2065	106,864,240	7,645	0.00003	2,612	3,269	443	(214)	7,430	2066
2070	106,864,240	2,928	0.00001	266	1,307	146	(895)	2,034	2071

Mississippi Municipal Retirement Systems
City of Greenwood

50 Year Cash Flow Projection
Based on Valuation Assumptions





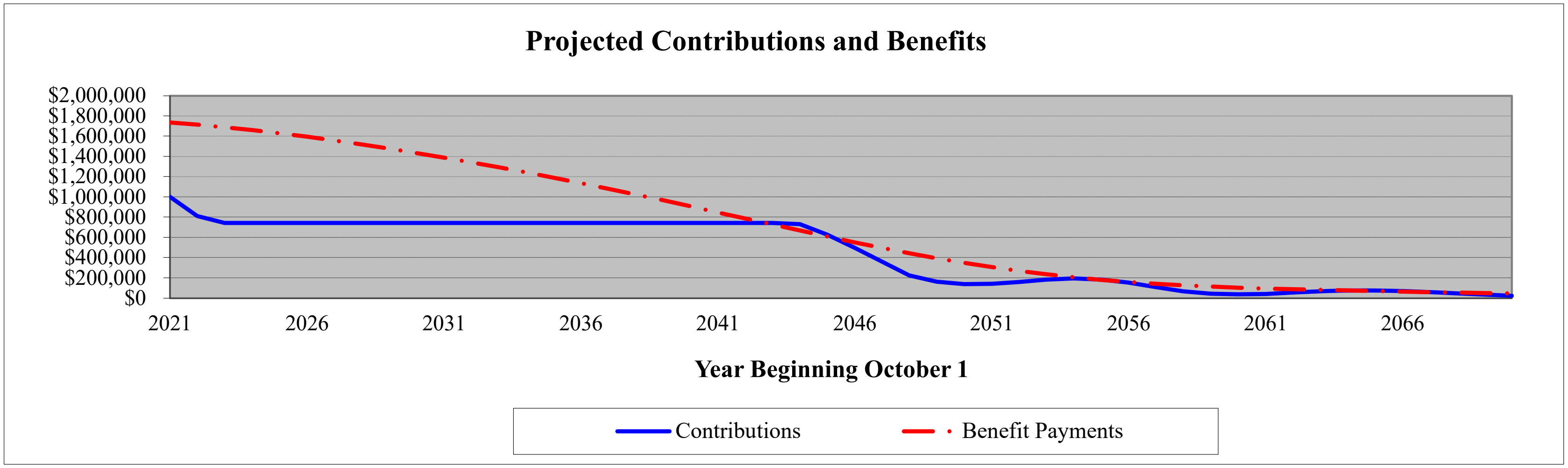
Mississippi Municipal Retirement Systems
City of Gulfport

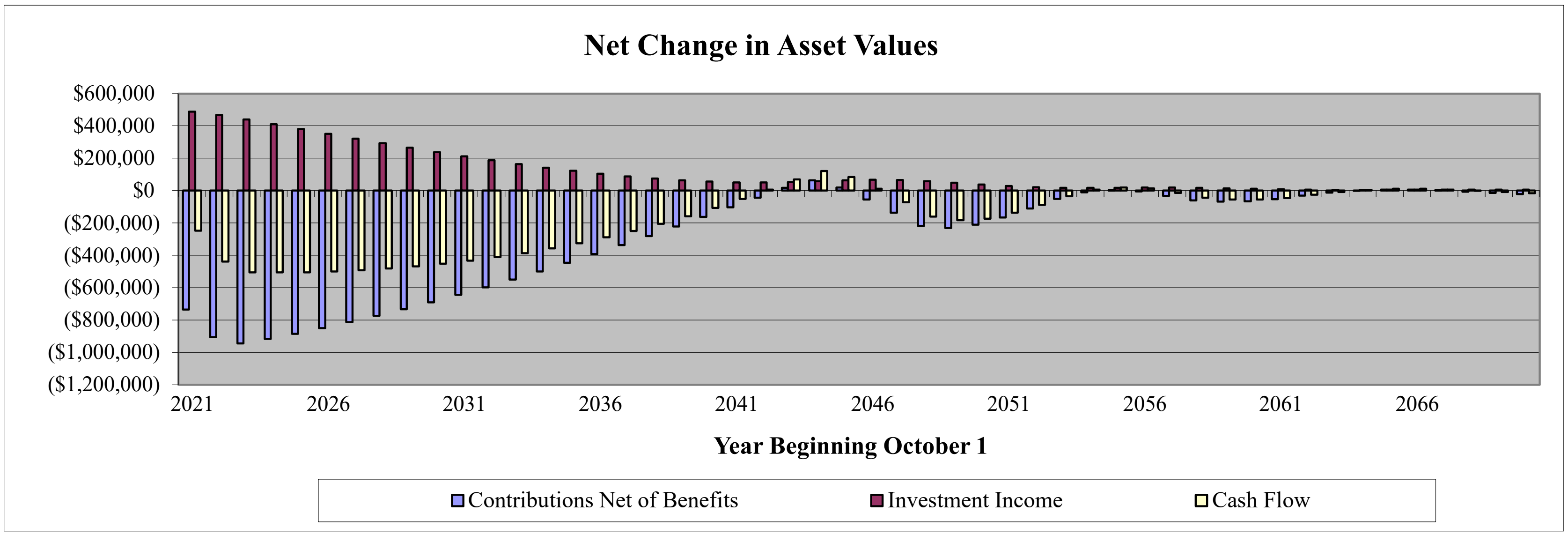
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$816,814,675	$8,421,021	0.00091	$1,001,299	$1,736,629	$487,555	($247,775)	$8,173,246	2022
2022	816,814,675	8,173,246	0.00091	808,647	1,714,381	467,485	(438,249)	7,734,997	2023
2023	816,814,675	7,734,997	0.00091	743,301	1,688,313	439,800	(505,212)	7,229,785	2024
2024	816,814,675	7,229,785	0.00091	743,301	1,659,678	410,089	(506,288)	6,723,497	2025
2025	816,814,675	6,723,497	0.00091	743,301	1,628,865	380,377	(505,187)	6,218,310	2026
2026	816,814,675	6,218,310	0.00091	743,301	1,594,606	350,834	(500,471)	5,717,840	2027
2027	816,814,675	5,717,840	0.00091	743,301	1,557,107	321,673	(492,133)	5,225,707	2028
2028	816,814,675	5,225,707	0.00091	743,301	1,517,840	293,070	(481,469)	4,744,239	2029
2029	816,814,675	4,744,239	0.00091	743,301	1,476,750	265,165	(468,284)	4,275,954	2030
2030	816,814,675	4,275,954	0.00091	743,301	1,433,753	238,116	(452,336)	3,823,618	2031
2035	816,814,675	2,234,990	0.00091	743,301	1,190,512	121,887	(325,324)	1,909,666	2036
2040	816,814,675	1,005,737	0.00091	743,301	906,658	55,978	(107,379)	898,358	2041
2045	816,814,675	1,043,313	0.00074	627,195	607,917	63,695	82,973	1,126,287	2046
2050	816,814,675	721,851	0.00043	136,787	347,674	37,386	(173,501)	548,349	2051
2055	816,814,675	294,318	0.00022	180,307	179,834	17,820	18,293	312,612	2056
2060	816,814,675	213,033	0.00012	35,981	102,091	10,918	(55,192)	157,841	2061
2065	816,814,675	82,081	0.00008	75,067	68,310	5,167	11,924	94,005	2066
2070	816,814,675	102,718	0.00005	22,162	44,887	5,537	(17,188)	85,529	2071

Mississippi Municipal Retirement Systems
City of Gulfport

50 Year Cash Flow Projection
Based on Valuation Assumptions





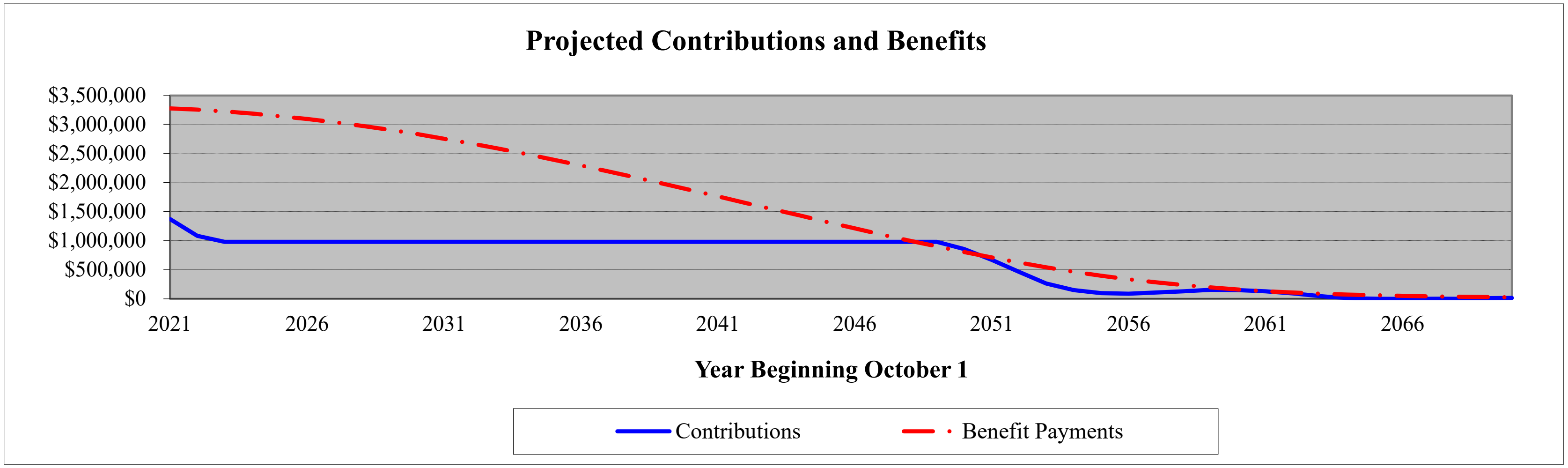
Mississippi Municipal Retirement Systems
City of Hattiesburg

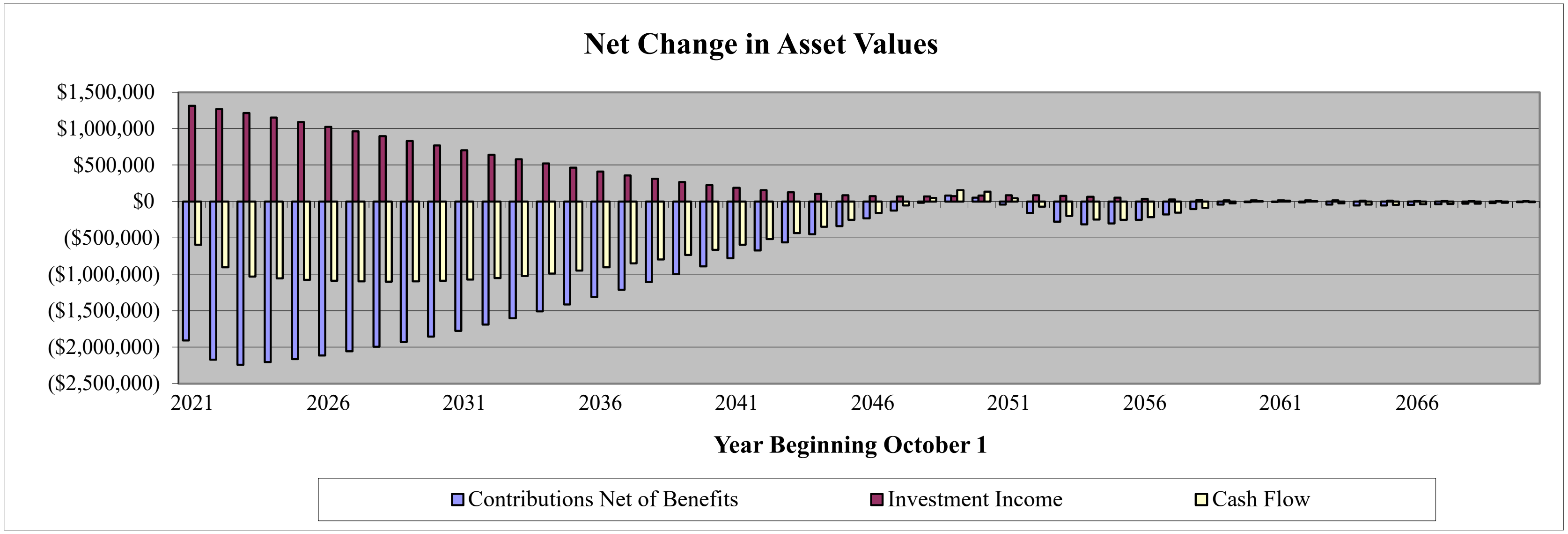
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$482,280,326	$22,642,699	0.00203	$1,369,171	$3,276,128	$1,313,045	($593,912)	$22,048,787	2022
2022	482,280,326	22,048,787	0.00203	1,079,102	3,252,513	1,269,171	(904,240)	21,144,547	2023
2023	482,280,326	21,144,547	0.00203	979,029	3,221,676	1,212,401	(1,030,246)	20,114,301	2024
2024	482,280,326	20,114,301	0.00203	979,029	3,185,273	1,151,156	(1,055,088)	19,059,213	2025
2025	482,280,326	19,059,213	0.00203	979,029	3,142,492	1,088,599	(1,074,864)	17,984,349	2026
2026	482,280,326	17,984,349	0.00203	979,029	3,093,354	1,025,034	(1,089,291)	16,895,057	2027
2027	482,280,326	16,895,057	0.00203	979,029	3,037,606	960,793	(1,097,784)	15,797,273	2028
2028	482,280,326	15,797,273	0.00203	979,029	2,975,376	896,232	(1,100,115)	14,697,158	2029
2029	482,280,326	14,697,158	0.00203	979,029	2,907,595	831,696	(1,096,870)	13,600,288	2030
2030	482,280,326	13,600,288	0.00203	979,029	2,834,261	767,521	(1,087,711)	12,512,577	2031
2035	482,280,326	8,379,200	0.00203	979,029	2,392,249	464,819	(948,401)	7,430,799	2036
2040	482,280,326	4,146,974	0.00203	979,029	1,869,964	224,337	(666,598)	3,480,376	2041
2045	482,280,326	1,588,625	0.00203	979,029	1,319,394	85,967	(254,398)	1,334,227	2046
2050	482,280,326	1,320,886	0.00166	852,899	800,193	81,485	134,191	1,455,078	2051
2055	482,280,326	980,064	0.00082	91,918	395,186	50,255	(253,013)	727,051	2056
2060	482,280,326	246,468	0.00032	145,285	156,733	14,570	3,122	249,590	2061
2065	482,280,326	188,214	0.00012	0	55,620	9,729	(45,891)	142,323	2066
2070	482,280,326	23,365	0.00005	13,544	23,770	1,109	(9,117)	14,248	2071

Mississippi Municipal Retirement Systems
City of Hattiesburg

50 Year Cash Flow Projection
Based on Valuation Assumptions





Mississippi Municipal Retirement Systems
City of Jackson

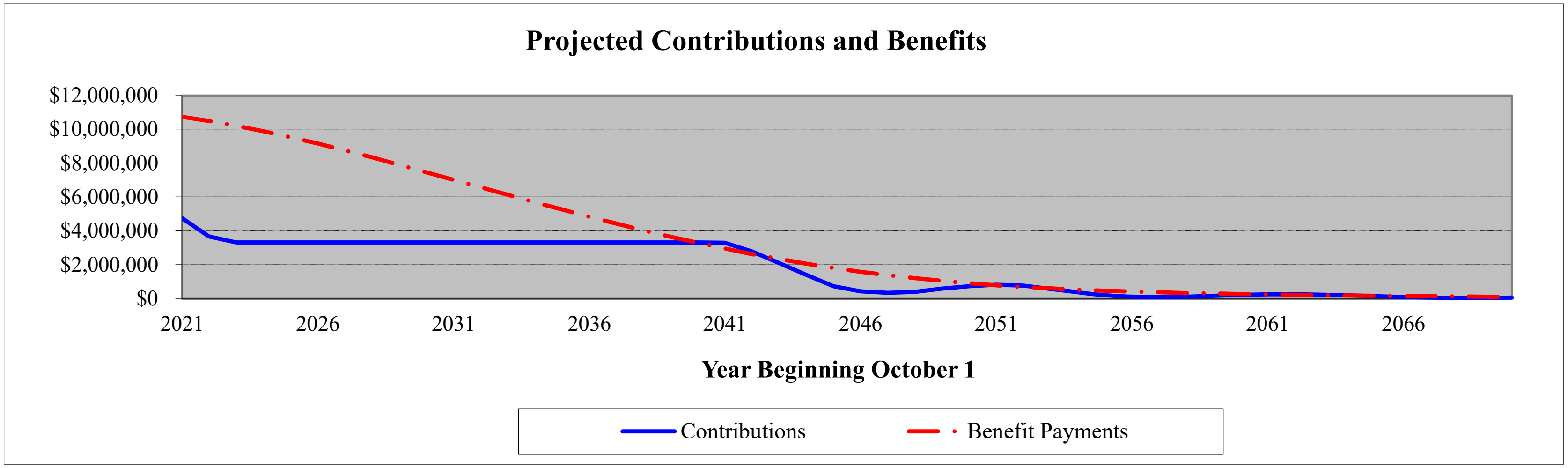
Cash Flow Projection

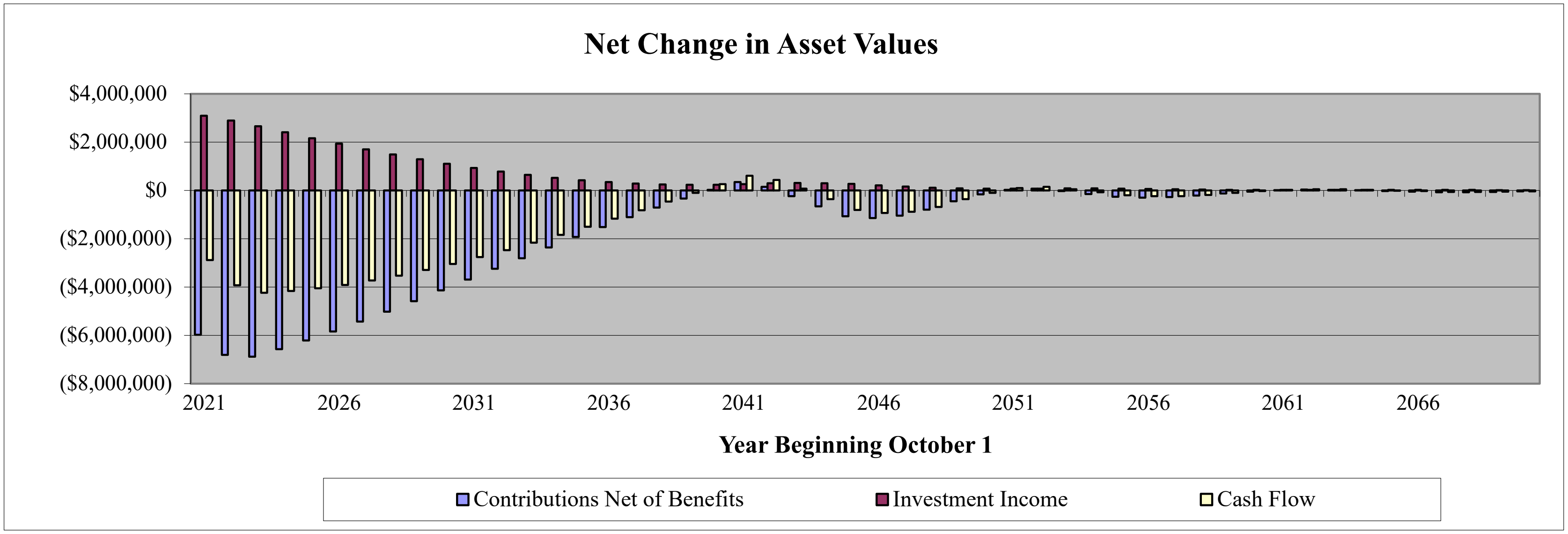
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$1,251,727,960	$54,019,648	0.00265	$4,754,174	$10,733,486	$3,089,970	($2,889,342)	$51,130,306	2022
2022	1,251,727,960	51,130,306	0.00265	3,673,822	10,492,551	2,890,146	(3,928,583)	47,201,723	2023
2023	1,251,727,960	47,201,723	0.00265	3,317,079	10,209,892	2,650,258	(4,242,555)	42,959,168	2024
2024	1,251,727,960	42,959,168	0.00265	3,317,079	9,890,487	2,403,104	(4,170,304)	38,788,864	2025
2025	1,251,727,960	38,788,864	0.00265	3,317,079	9,538,244	2,161,299	(4,059,866)	34,728,998	2026
2026	1,251,727,960	34,728,998	0.00265	3,317,079	9,158,713	1,926,990	(3,914,644)	30,814,354	2027
2027	1,251,727,960	30,814,354	0.00265	3,317,079	8,756,632	1,702,138	(3,737,415)	27,076,939	2028
2028	1,251,727,960	27,076,939	0.00265	3,317,079	8,336,765	1,488,539	(3,531,147)	23,545,792	2029
2029	1,251,727,960	23,545,792	0.00265	3,317,079	7,903,790	1,287,810	(3,298,901)	20,246,891	2030
2030	1,251,727,960	20,246,891	0.00265	3,317,079	7,462,163	1,101,389	(3,043,695)	17,203,196	2031
2035	1,251,727,960	7,945,349	0.00265	3,317,079	5,254,166	422,957	(1,514,130)	6,431,219	2036
2040	1,251,727,960	3,863,748	0.00263	3,317,079	3,293,067	234,472	258,484	4,122,232	2041
2045	1,251,727,960	4,863,305	0.00145	736,454	1,810,058	262,230	(811,374)	4,051,931	2046
2050	1,251,727,960	1,162,514	0.00072	736,200	904,084	65,328	(102,556)	1,059,958	2051
2055	1,251,727,960	1,261,668	0.00037	196,828	463,594	68,380	(198,386)	1,063,282	2056
2060	1,251,727,960	277,318	0.00022	218,963	269,425	15,274	(35,188)	242,130	2061
2065	1,251,727,960	371,300	0.00013	142,996	167,552	21,732	(2,824)	368,476	2066
2070	1,251,727,960	153,438	0.00008	52,195	99,894	7,861	(39,838)	113,600	2071

Mississippi Municipal Retirement Systems
City of Jackson

50 Year Cash Flow Projection
Based on Valuation Assumptions





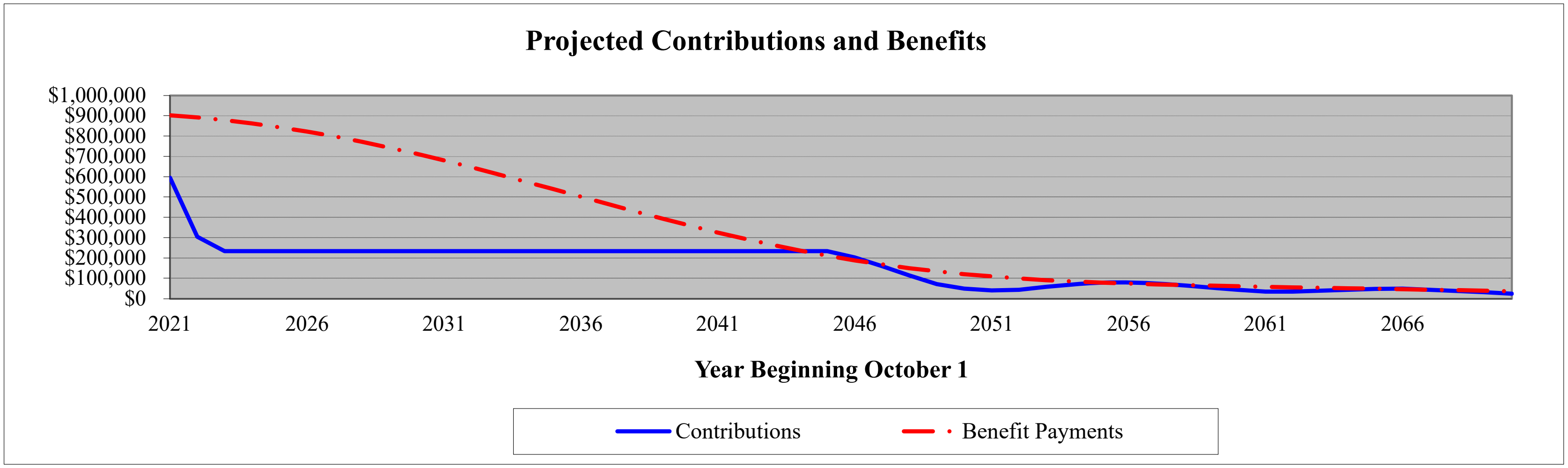
Mississippi Municipal Retirement Systems
City of Laurel

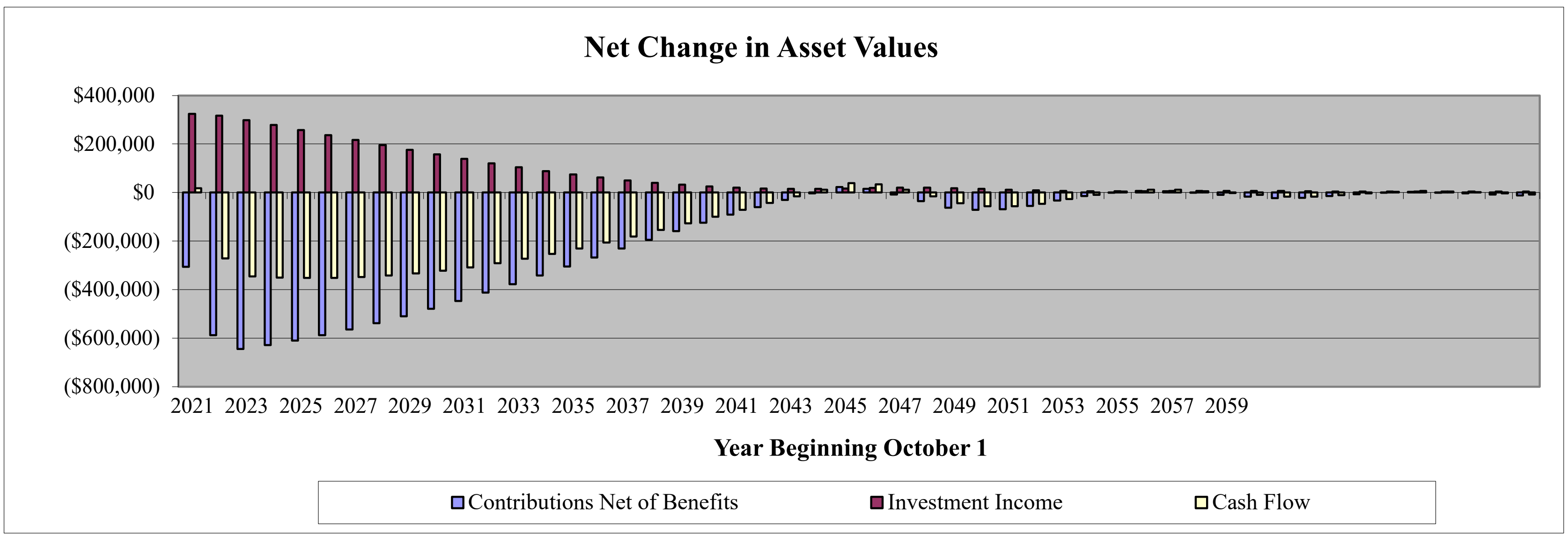
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$197,898,826	$5,506,153	0.00118	$595,692	$902,356	$323,982	$17,318	$5,523,471	2022
2022	197,898,826	5,523,471	0.00118	303,775	891,553	316,651	(271,127)	5,252,344	2023
2023	197,898,826	5,252,344	0.00118	233,521	878,135	298,554	(346,060)	4,906,284	2024
2024	197,898,826	4,906,284	0.00118	233,521	862,051	278,096	(350,434)	4,555,850	2025
2025	197,898,826	4,555,850	0.00118	233,521	843,295	257,454	(352,320)	4,203,530	2026
2026	197,898,826	4,203,530	0.00118	233,521	821,912	236,776	(351,615)	3,851,915	2027
2027	197,898,826	3,851,915	0.00118	233,521	797,989	216,216	(348,252)	3,503,663	2028
2028	197,898,826	3,503,663	0.00118	233,521	771,654	195,932	(342,201)	3,161,462	2029
2029	197,898,826	3,161,462	0.00118	233,521	743,080	176,081	(333,478)	2,827,984	2030
2030	197,898,826	2,827,984	0.00118	233,521	712,474	156,817	(322,136)	2,505,849	2031
2035	197,898,826	1,379,163	0.00118	233,521	538,414	74,352	(230,541)	1,148,622	2036
2040	197,898,826	478,612	0.00118	233,521	358,389	25,234	(99,634)	378,978	2041
2045	197,898,826	260,536	0.00107	233,521	211,317	16,424	38,628	299,164	2046
2050	197,898,826	283,642	0.00061	48,635	120,534	15,017	(56,882)	226,759	2051
2055	197,898,826	86,712	0.00040	77,008	78,443	5,203	3,768	90,480	2056
2060	197,898,826	117,103	0.00031	43,878	60,434	6,591	(9,965)	107,138	2061
2065	197,898,826	58,648	0.00025	47,094	48,504	3,506	2,096	60,744	2066
2070	197,898,826	68,182	0.00019	24,997	36,787	3,774	(8,016)	60,166	2071

Mississippi Municipal Retirement Systems
City of Laurel

50 Year Cash Flow Projection
Based on Valuation Assumptions





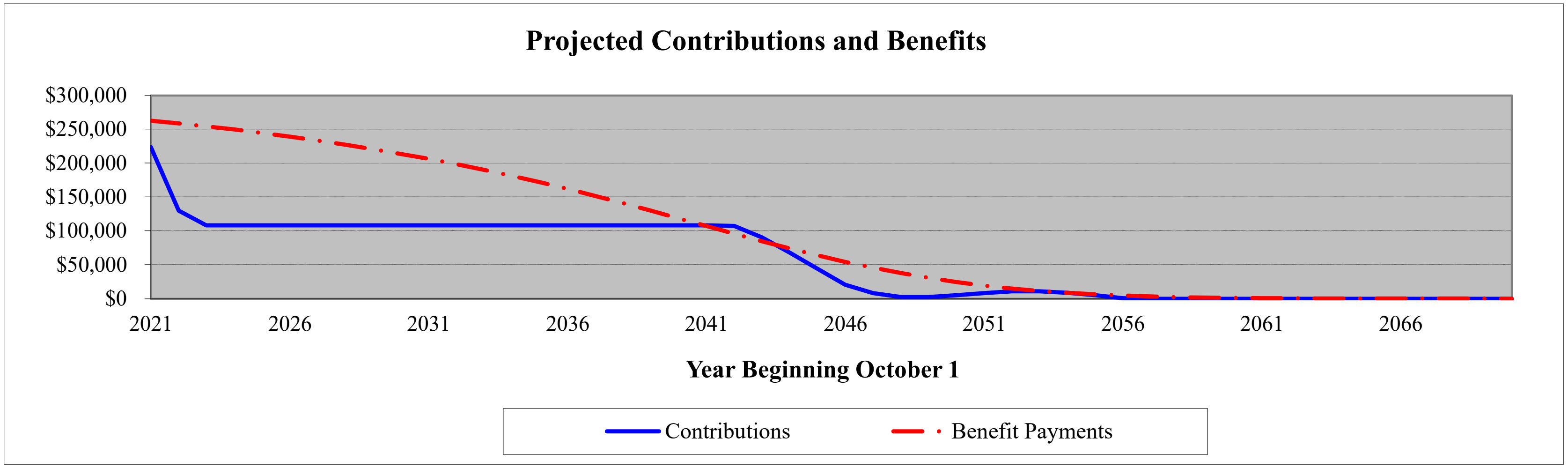
Mississippi Municipal Retirement Systems
City of McComb

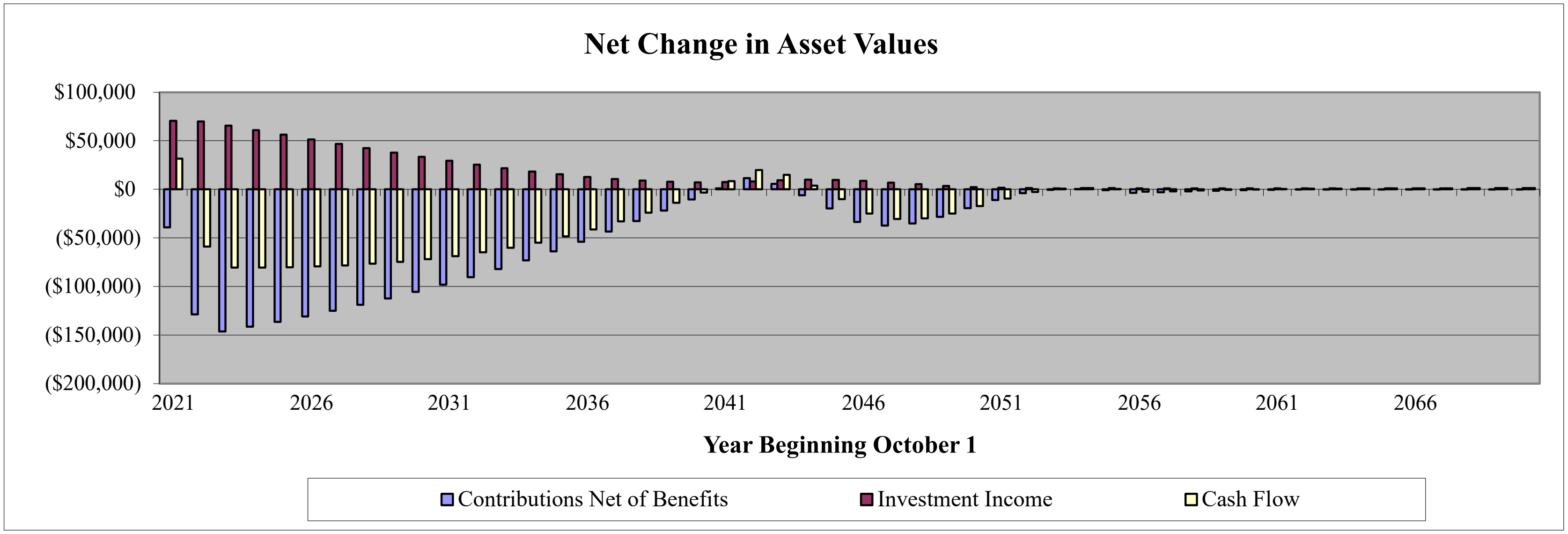
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$102,885,698	$1,184,699	0.00105	$223,601	$262,665	$70,510	$31,446	$1,216,145	2022
2022	102,885,698	1,216,145	0.00105	129,893	258,699	69,738	(59,068)	1,157,077	2023
2023	102,885,698	1,157,077	0.00105	108,030	254,322	65,643	(80,649)	1,076,428	2024
2024	102,885,698	1,076,428	0.00105	108,030	249,563	60,905	(80,628)	995,800	2025
2025	102,885,698	995,800	0.00105	108,030	244,444	56,180	(80,234)	915,566	2026
2026	102,885,698	915,566	0.00105	108,030	238,979	51,489	(79,460)	836,106	2027
2027	102,885,698	836,106	0.00105	108,030	233,168	46,855	(78,283)	757,823	2028
2028	102,885,698	757,823	0.00105	108,030	227,003	42,302	(76,671)	681,152	2029
2029	102,885,698	681,152	0.00105	108,030	220,472	37,858	(74,584)	606,568	2030
2030	102,885,698	606,568	0.00105	108,030	213,553	33,552	(71,971)	534,597	2031
2035	102,885,698	285,820	0.00105	108,030	171,925	15,388	(48,507)	237,313	2036
2040	102,885,698	125,028	0.00105	108,030	118,475	7,253	(3,192)	121,836	2041
2045	102,885,698	168,697	0.00062	44,018	63,808	9,616	(10,174)	158,523	2046
2050	102,885,698	48,094	0.00024	4,985	24,540	2,327	(17,228)	30,866	2051
2055	102,885,698	20,292	0.00006	5,152	6,123	1,199	228	20,520	2056
2060	102,885,698	14,264	0.00001	0	883	837	(46)	14,217	2061
2065	102,885,698	16,576	0.00000	0	63	1,001	938	17,514	2066
2070	102,885,698	22,078	0.00000	0	2	1,336	1,334	23,412	2071

Mississippi Municipal Retirement Systems
City of McComb

50 Year Cash Flow Projection
Based on Valuation Assumptions





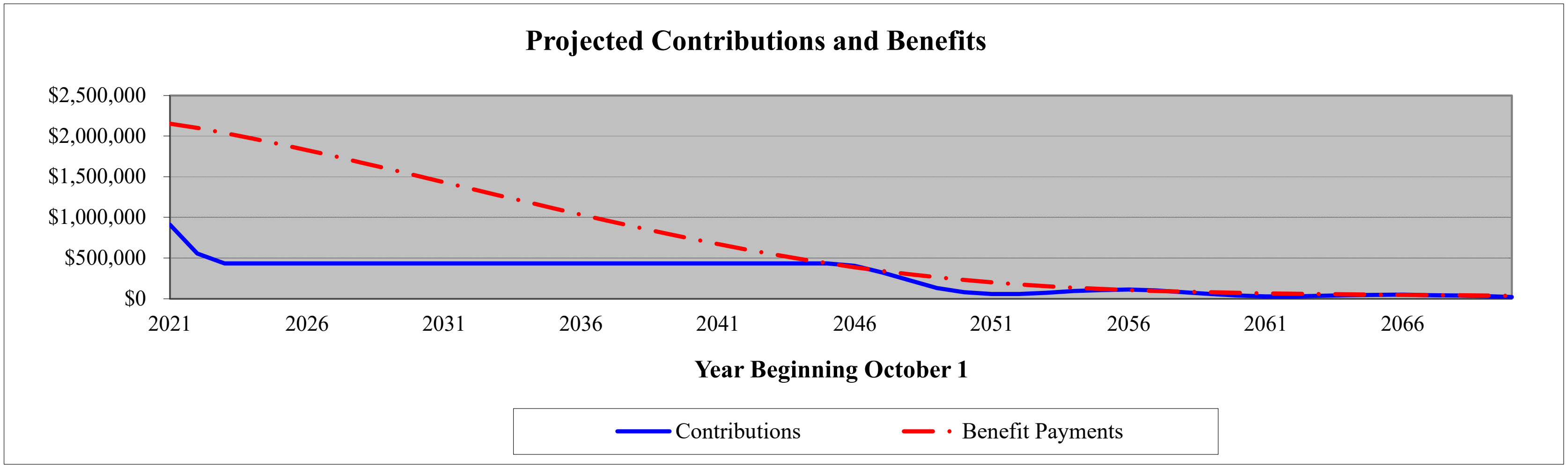
Mississippi Municipal Retirement Systems
City of Meridian

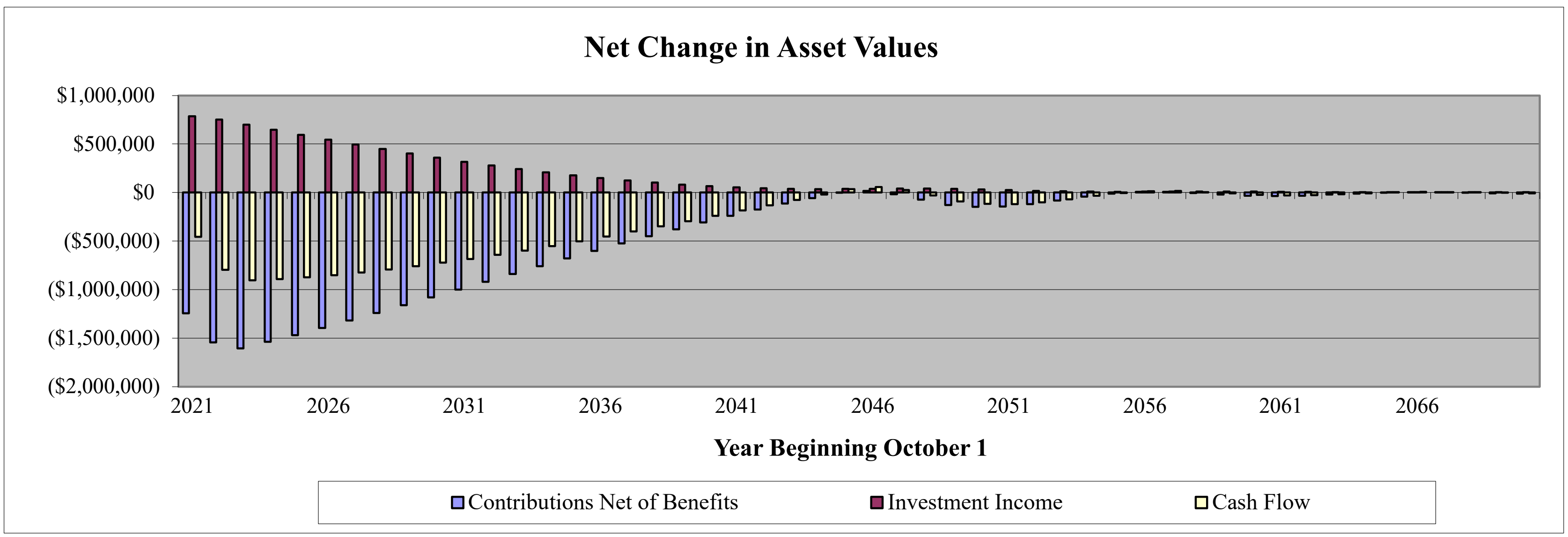
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$365,967,586	$13,611,886	0.00118	$908,161	$2,151,903	$786,448	($457,294)	$13,154,592	2022
2022	365,967,586	13,154,592	0.00118	552,611	2,097,952	749,793	(795,548)	12,359,044	2023
2023	365,967,586	12,359,044	0.00118	431,842	2,037,251	699,872	(905,537)	11,453,507	2024
2024	365,967,586	11,453,507	0.00118	431,842	1,971,290	647,053	(892,395)	10,561,112	2025
2025	365,967,586	10,561,112	0.00118	431,842	1,901,146	595,153	(874,151)	9,686,961	2026
2026	365,967,586	9,686,961	0.00118	431,842	1,827,675	544,457	(851,376)	8,835,585	2027
2027	365,967,586	8,835,585	0.00118	431,842	1,751,602	495,216	(824,544)	8,011,041	2028
2028	365,967,586	8,011,041	0.00118	431,842	1,673,566	447,657	(794,067)	7,216,974	2029
2029	365,967,586	7,216,974	0.00118	431,842	1,594,146	401,983	(760,321)	6,456,652	2030
2030	365,967,586	6,456,652	0.00118	431,842	1,513,838	358,378	(723,618)	5,733,035	2031
2035	365,967,586	3,256,452	0.00118	431,842	1,112,206	176,737	(503,627)	2,752,824	2036
2040	365,967,586	1,251,939	0.00118	431,842	739,499	66,572	(241,085)	1,010,853	2041
2045	365,967,586	597,293	0.00118	431,842	434,802	36,048	33,088	630,381	2046
2050	365,967,586	584,581	0.00063	79,942	228,826	30,930	(117,954)	466,627	2051
2055	365,967,586	141,830	0.00032	106,055	118,523	8,209	(4,259)	137,571	2056
2060	365,967,586	163,390	0.00019	37,138	70,058	8,904	(24,016)	139,374	2061
2065	365,967,586	57,818	0.00013	46,412	48,477	3,436	1,371	59,188	2066
2070	365,967,586	68,279	0.00009	22,112	34,471	3,762	(8,597)	59,681	2071

Mississippi Municipal Retirement Systems
City of Meridian

50 Year Cash Flow Projection
Based on Valuation Assumptions





Mississippi Municipal Retirement Systems
City of Natchez

Cash Flow Projection

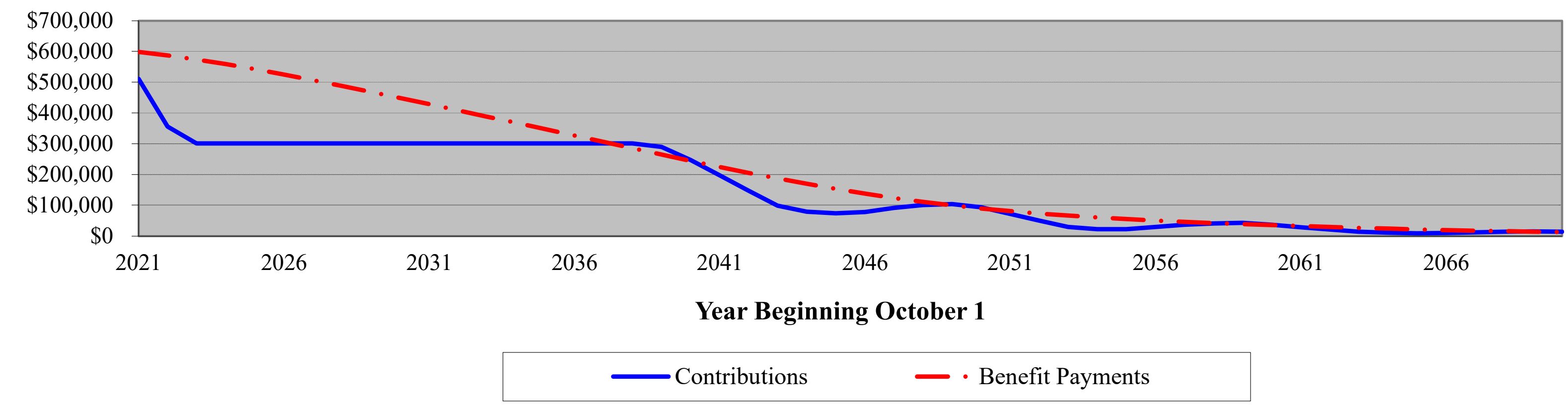
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$133,225,319	$1,886,200	0.00226	$511,340	$598,254	$111,525	$24,611	$1,910,811	2022
2022	133,225,319	1,910,811	0.00226	355,712	587,001	108,710	(122,579)	1,788,232	2023
2023	133,225,319	1,788,232	0.00226	301,089	573,695	100,063	(172,543)	1,615,689	2024
2024	133,225,319	1,615,689	0.00226	301,089	558,680	90,071	(167,520)	1,448,169	2025
2025	133,225,319	1,448,169	0.00226	301,089	542,285	80,425	(160,771)	1,287,398	2026
2026	133,225,319	1,287,398	0.00226	301,089	524,807	71,219	(152,499)	1,134,899	2027
2027	133,225,319	1,134,899	0.00226	301,089	506,496	62,539	(142,868)	992,031	2028
2028	133,225,319	992,031	0.00226	301,089	487,561	54,460	(132,012)	860,019	2029
2029	133,225,319	860,019	0.00226	301,089	468,176	47,051	(120,036)	739,982	2030
2030	133,225,319	739,982	0.00226	301,089	448,462	40,376	(106,997)	632,985	2031
2035	133,225,319	356,678	0.00226	301,089	346,845	20,215	(25,541)	331,137	2036
2040	133,225,319	425,889	0.00183	246,825	244,233	25,844	28,436	454,325	2041
2045	133,225,319	284,320	0.00115	73,352	152,777	14,834	(64,591)	219,729	2046
2050	133,225,319	159,789	0.00067	93,454	89,330	9,790	13,914	173,703	2051
2055	133,225,319	102,693	0.00041	21,578	54,799	5,223	(27,998)	74,695	2056
2060	133,225,319	60,587	0.00026	36,205	35,132	3,697	4,770	65,357	2061
2065	133,225,319	41,216	0.00016	9,229	21,236	2,136	(9,871)	31,345	2066
2070	133,225,319	20,870	0.00009	13,247	12,589	1,282	1,940	22,810	2071

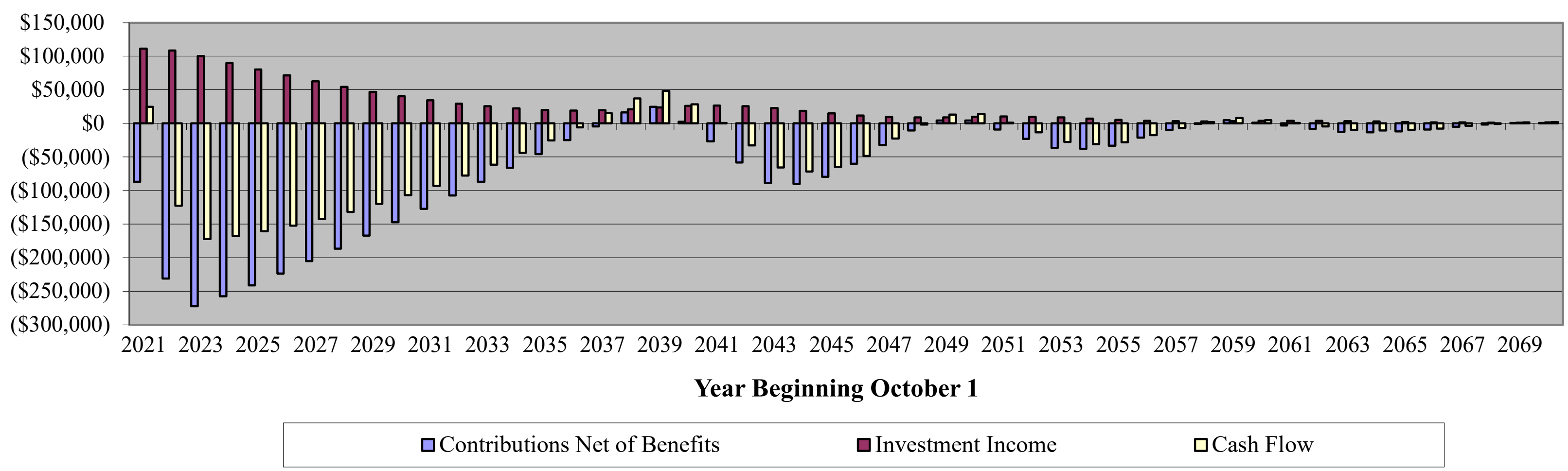
Mississippi Municipal Retirement Systems
City of Natchez

50 Year Cash Flow Projection
Based on Valuation Assumptions

Projected Contributions and Benefits



Net Change in Asset Values



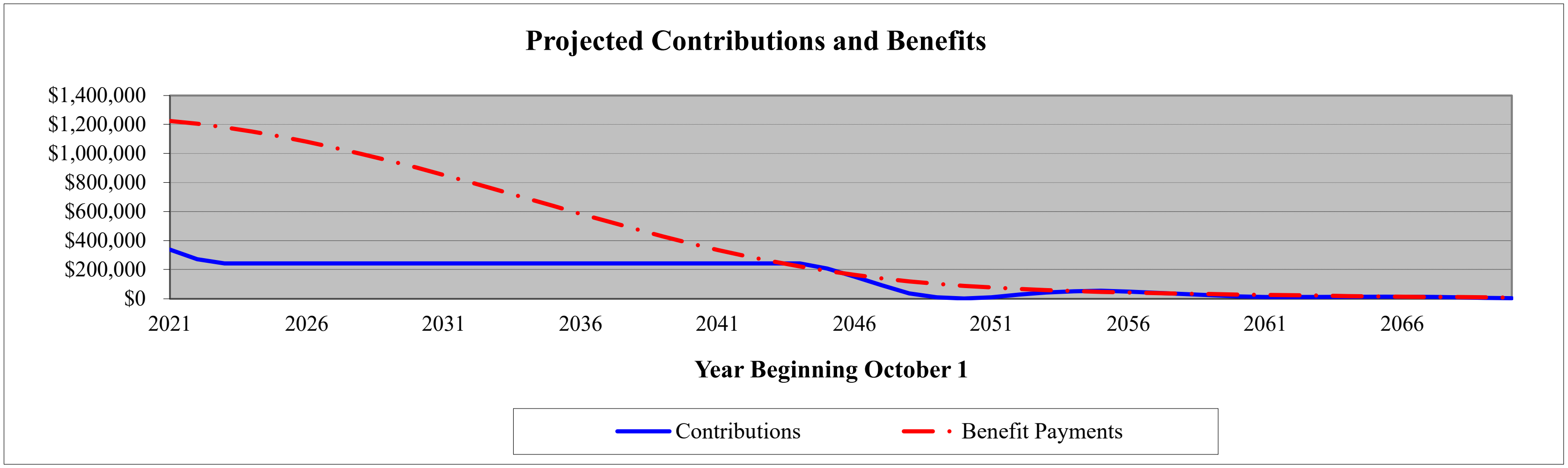
Mississippi Municipal Retirement Systems
City of Pascagoula

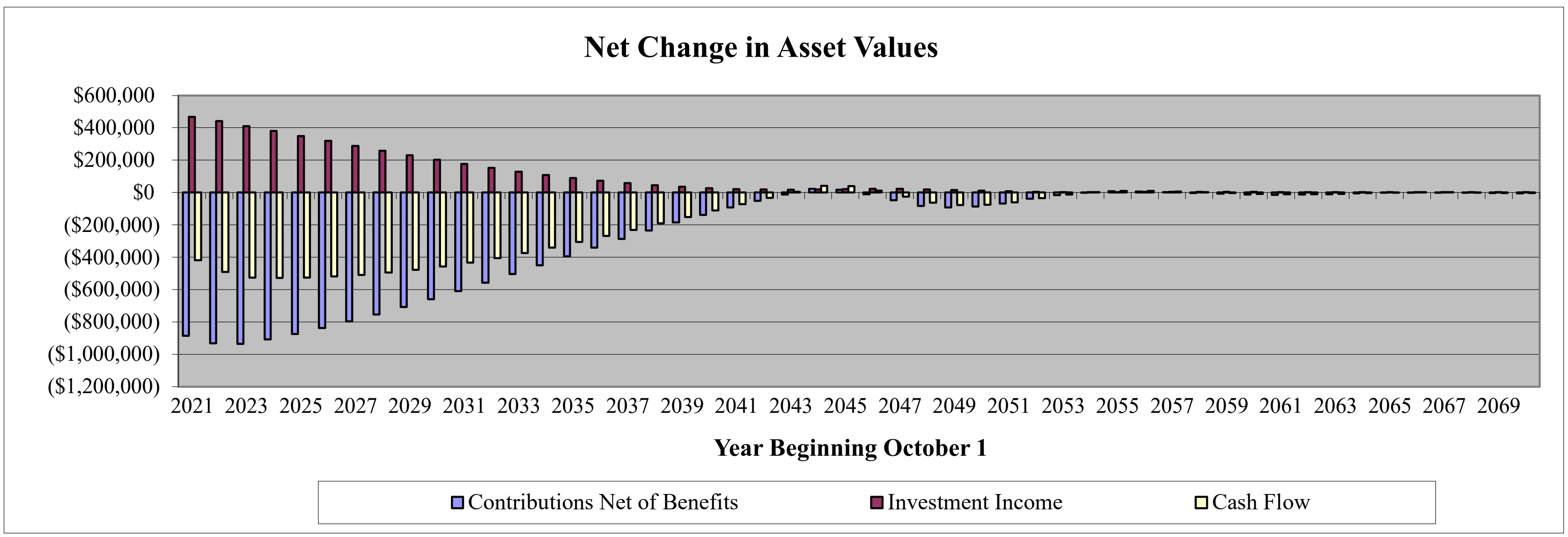
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$227,131,210	$8,163,049	0.00107	$337,780	$1,224,246	$467,443	($419,023)	$7,744,026	2022
2022	227,131,210	7,744,026	0.00107	271,422	1,203,972	440,718	(491,832)	7,252,194	2023
2023	227,131,210	7,252,194	0.00107	243,030	1,179,538	410,844	(525,664)	6,726,530	2024
2024	227,131,210	6,726,530	0.00107	243,030	1,150,383	379,911	(527,442)	6,199,088	2025
2025	227,131,210	6,199,088	0.00107	243,030	1,117,234	348,988	(525,216)	5,673,872	2026
2026	227,131,210	5,673,872	0.00107	243,030	1,080,458	318,309	(519,119)	5,154,753	2027
2027	227,131,210	5,154,753	0.00107	243,030	1,040,325	288,099	(509,196)	4,645,557	2028
2028	227,131,210	4,645,557	0.00107	243,030	997,109	258,580	(495,499)	4,150,058	2029
2029	227,131,210	4,150,058	0.00107	243,030	951,104	229,974	(478,100)	3,671,958	2030
2030	227,131,210	3,671,958	0.00107	243,030	902,648	202,493	(457,125)	3,214,833	2031
2035	227,131,210	1,660,715	0.00107	243,030	637,971	88,702	(306,239)	1,354,476	2036
2040	227,131,210	512,592	0.00107	243,030	381,018	26,899	(111,089)	401,504	2041
2045	227,131,210	342,921	0.00084	207,499	190,138	21,264	38,625	381,546	2046
2050	227,131,210	226,589	0.00039	788	87,713	11,118	(75,807)	150,782	2051
2055	227,131,210	42,972	0.00020	53,583	46,550	2,809	9,842	52,813	2056
2060	227,131,210	65,529	0.00012	15,278	28,153	3,581	(9,294)	56,234	2061
2065	227,131,210	22,463	0.00007	13,854	15,740	1,303	(583)	21,880	2066
2070	227,131,210	20,923	0.00003	2,251	7,203	1,118	(3,834)	17,089	2071

Mississippi Municipal Retirement Systems
City of Pascagoula

50 Year Cash Flow Projection
Based on Valuation Assumptions





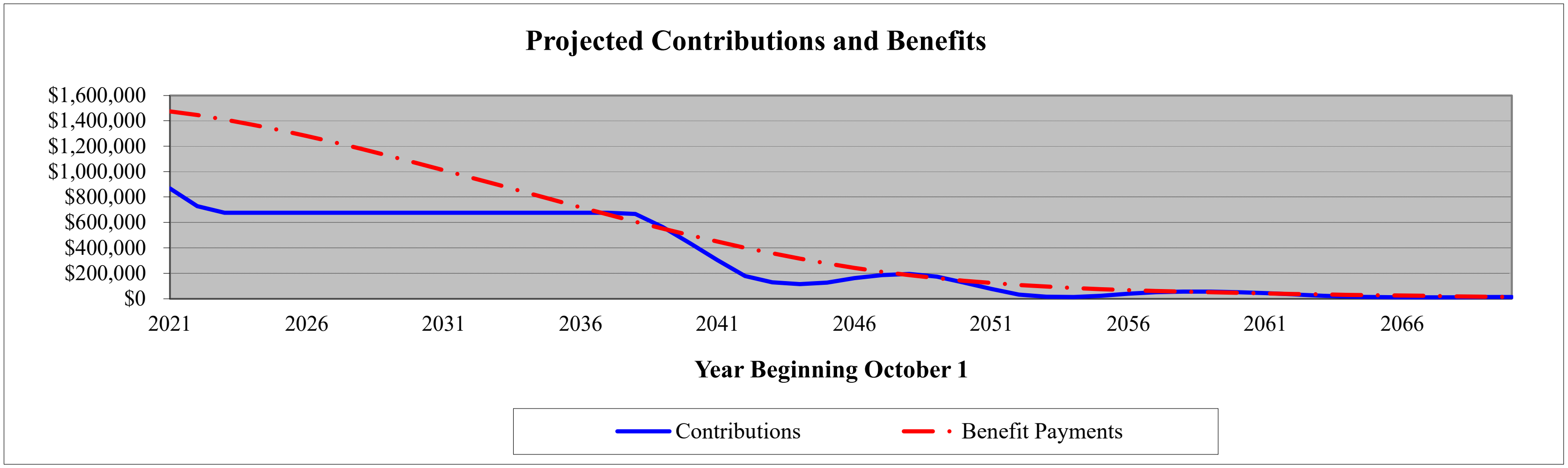
Mississippi Municipal Retirement Systems
City of Tupelo

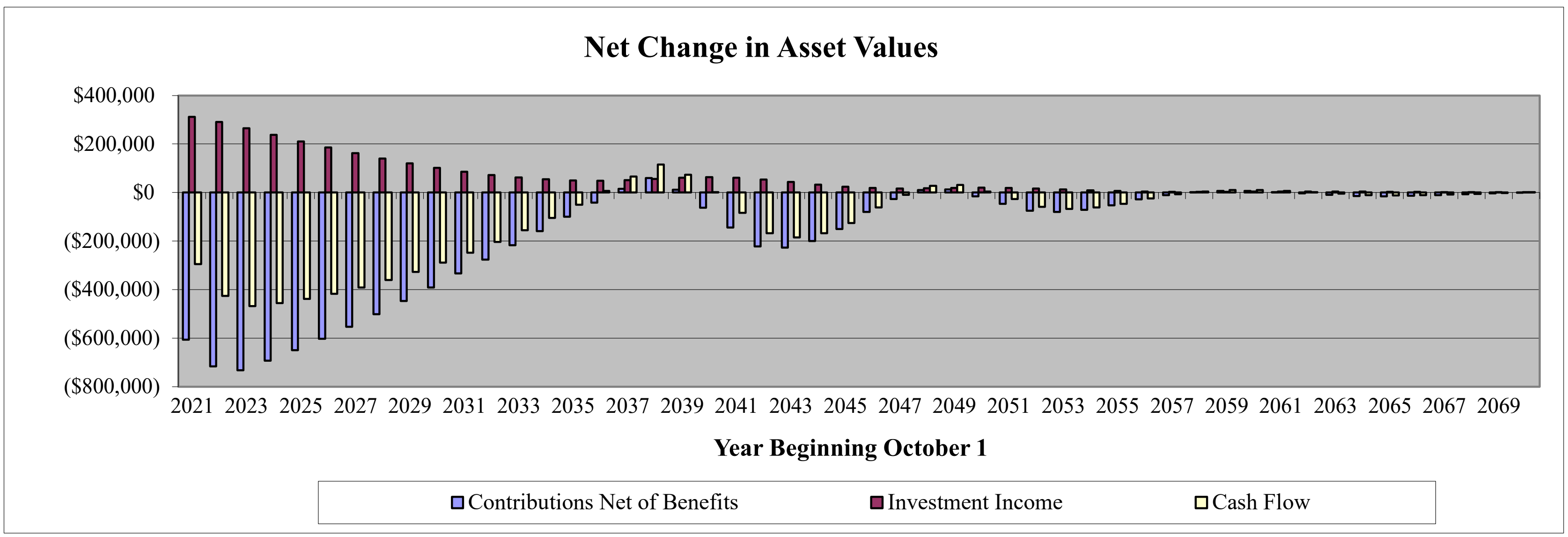
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$545,794,918	$5,449,740	0.00124	$868,708	$1,475,099	$311,635	($294,756)	$5,154,984	2022
2022	545,794,918	5,154,984	0.00124	727,272	1,444,150	290,509	(426,369)	4,728,615	2023
2023	545,794,918	4,728,615	0.00124	676,786	1,408,829	264,262	(467,781)	4,260,834	2024
2024	545,794,918	4,260,834	0.00124	676,786	1,369,377	237,137	(455,454)	3,805,380	2025
2025	545,794,918	3,805,380	0.00124	676,786	1,326,122	210,871	(438,465)	3,366,915	2026
2026	545,794,918	3,366,915	0.00124	676,786	1,279,461	185,735	(416,940)	2,949,975	2027
2027	545,794,918	2,949,975	0.00124	676,786	1,229,840	161,989	(391,065)	2,558,909	2028
2028	545,794,918	2,558,909	0.00124	676,786	1,177,724	139,883	(361,055)	2,197,854	2029
2029	545,794,918	2,197,854	0.00124	676,786	1,123,562	119,654	(327,122)	1,870,732	2030
2030	545,794,918	1,870,732	0.00124	676,786	1,067,768	101,526	(289,456)	1,581,276	2031
2035	545,794,918	868,956	0.00124	676,786	777,151	49,580	(50,785)	818,171	2036
2040	545,794,918	1,077,908	0.00091	435,607	498,487	63,339	459	1,078,367	2041
2045	545,794,918	474,426	0.00051	126,211	276,738	24,216	(126,311)	348,114	2046
2050	545,794,918	334,756	0.00026	124,780	140,348	19,789	4,221	338,977	2051
2055	545,794,918	124,194	0.00014	22,199	74,597	5,952	(46,446)	77,748	2056
2060	545,794,918	59,336	0.00008	50,412	44,621	3,762	9,553	68,889	2061
2065	545,794,918	60,210	0.00005	11,385	26,717	3,186	(12,146)	48,065	2066
2070	545,794,918	20,825	0.00002	11,653	12,806	1,226	73	20,898	2071

Mississippi Municipal Retirement Systems
City of Tupelo

50 Year Cash Flow Projection
Based on Valuation Assumptions





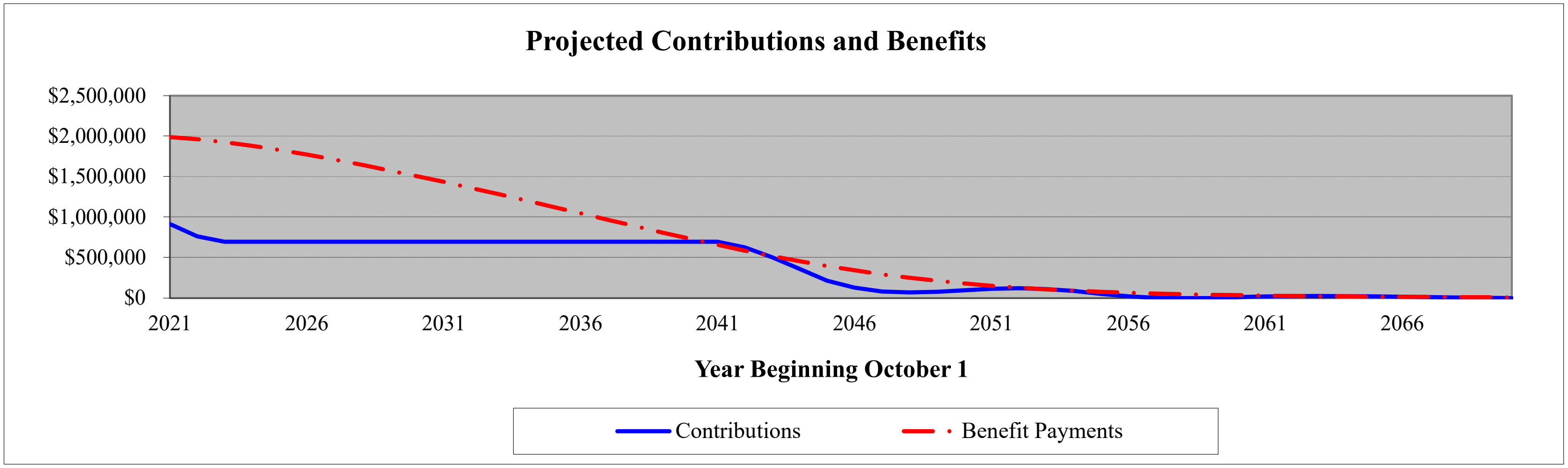
Mississippi Municipal Retirement Systems
City of Vicksburg

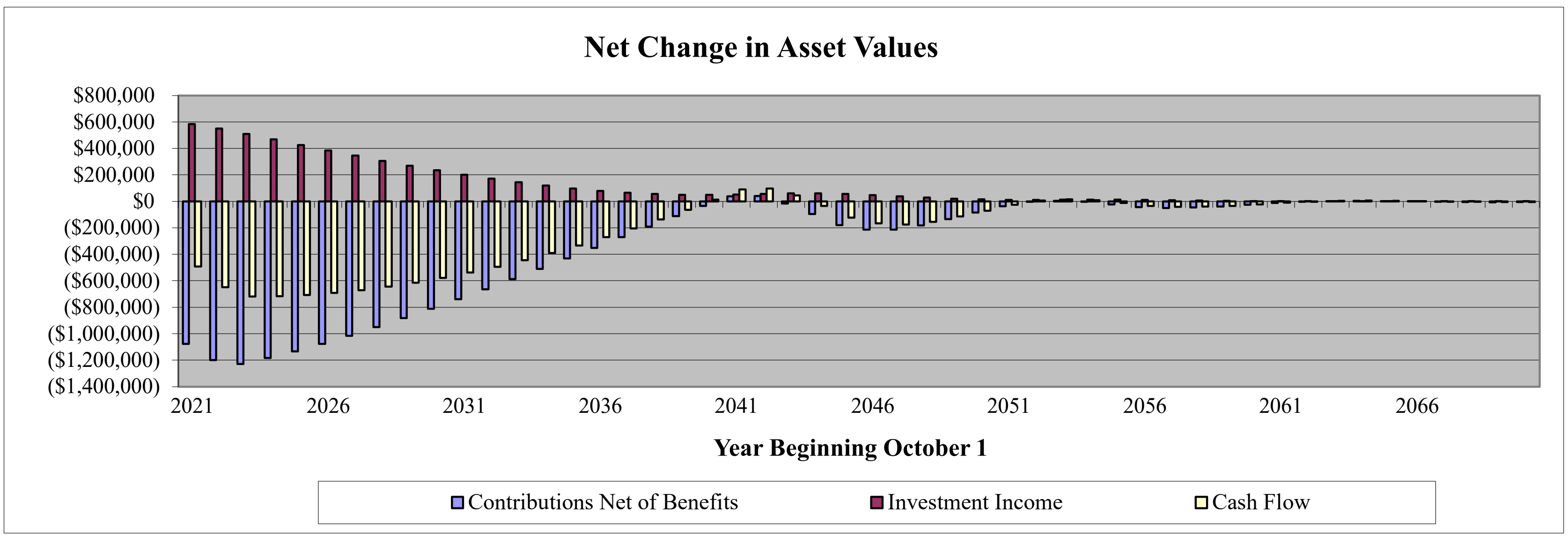
Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$308,408,615	$10,173,147	0.00225	$913,462	$1,989,837	$583,393	($492,982)	$9,680,164	2022
2022	308,408,615	9,680,164	0.00225	761,769	1,960,310	549,926	(648,615)	9,031,549	2023
2023	308,408,615	9,031,549	0.00225	693,919	1,922,636	509,786	(718,931)	8,312,619	2024
2024	308,408,615	8,312,619	0.00225	693,919	1,877,776	467,628	(716,229)	7,596,390	2025
2025	308,408,615	7,596,390	0.00225	693,919	1,826,712	425,818	(706,975)	6,889,415	2026
2026	308,408,615	6,889,415	0.00225	693,919	1,770,351	384,726	(691,706)	6,197,709	2027
2027	308,408,615	6,197,709	0.00225	693,919	1,709,511	344,691	(670,901)	5,526,809	2028
2028	308,408,615	5,526,809	0.00225	693,919	1,644,910	306,027	(644,964)	4,881,844	2029
2029	308,408,615	4,881,844	0.00225	693,919	1,577,131	269,027	(614,185)	4,267,660	2030
2030	308,408,615	4,267,660	0.00225	693,919	1,506,614	233,970	(578,725)	3,688,935	2031
2035	308,408,615	1,819,684	0.00225	693,919	1,124,814	97,248	(333,647)	1,486,036	2036
2040	308,408,615	809,478	0.00225	693,919	729,833	47,903	11,989	821,467	2041
2045	308,408,615	1,015,210	0.00128	213,845	393,972	56,051	(124,076)	891,134	2046
2050	308,408,615	278,509	0.00058	93,514	177,921	14,334	(70,073)	208,435	2051
2055	308,408,615	214,171	0.00024	49,947	74,414	12,228	(12,239)	201,932	2056
2060	308,408,615	51,022	0.00011	8,175	33,392	2,335	(22,882)	28,140	2061
2065	308,408,615	24,029	0.00005	17,868	15,423	1,527	3,972	28,001	2066
2070	308,408,615	19,732	0.00002	0	5,661	1,025	(4,636)	15,096	2071

Mississippi Municipal Retirement Systems
City of Vicksburg

50 Year Cash Flow Projection
Based on Valuation Assumptions





Mississippi Municipal Retirement Systems
City of Yazoo City

Cash Flow Projection
No Assumed Growth in Assessed Property, Certified Millage Rates, Assume 6.25% on Investments)

Year Beginning July 1	Value of Assessed Property	MVA Balance July 1	Millage Rate	Contributions	Benefit Payments	Investment Income	Cash Flow	MVA Balance June 30	Year Ending June 30
2021	$55,250,160	$208,652	0.00343	$170,315	$197,115	$11,825	($14,975)	$193,676	2022
2022	55,250,160	193,676	0.00360	182,602	196,116	11,315	(2,199)	191,477	2023
2023	55,250,160	191,477	0.00352	196,552	194,417	11,648	13,783	205,260	2024
2024	55,250,160	205,260	0.00347	195,538	191,983	12,524	16,079	221,339	2025
2025	55,250,160	221,339	0.00342	192,591	188,793	13,504	17,302	238,642	2026
2026	55,250,160	238,642	0.00335	189,590	184,840	14,579	19,329	257,971	2027
2027	55,250,160	257,971	0.00326	185,828	180,136	15,777	21,469	279,440	2028
2028	55,250,160	279,440	0.00316	168,221	174,710	16,713	10,224	289,664	2029
2029	55,250,160	289,664	0.00305	147,844	168,605	16,906	(3,855)	285,808	2030
2030	55,250,160	285,808	0.00293	126,418	161,877	16,235	(19,224)	266,584	2031
2035	55,250,160	176,821	0.00220	121,616	121,584	10,699	10,731	187,552	2036
2040	55,250,160	163,026	0.00142	40,476	78,709	8,723	(29,510)	133,516	2041
2045	55,250,160	67,452	0.00076	37,867	41,855	3,962	(26)	67,426	2046
2050	55,250,160	50,504	0.00030	2,479	16,647	2,633	(11,535)	38,968	2051
2055	55,250,160	7,529	0.00008	1,650	4,271	377	(2,244)	5,285	2056
2060	55,250,160	3,593	0.00001	0	583	200	(383)	3,210	2061
2065	55,250,160	3,174	0.00000	0	36	191	155	3,329	2066
2070	55,250,160	4,171	0.00000	0	1	252	251	4,422	2071

Mississippi Municipal Retirement Systems
City of Yazoo City

50 Year Cash Flow Projection
Based on Valuation Assumptions