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Retirement Systems
of Alabama

**Teachers' Retirement System of Alabama
Report of the Actuary on the Annual Valuation
Prepared as of September 30, 2020**





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

April 16, 2021

Board of Control
Teachers' Retirement System of Alabama
Montgomery, Alabama

Members of the Board:

In this report are submitted the results of the annual valuation of the assets and liabilities of the Teachers' Retirement System of Alabama, prepared as of September 30, 2020 in accordance with Section 16-25-19(q) of the act governing the operation of the System.

The purpose of this report is to provide a summary of the funded status of the System as of September 30, 2020 and to recommend rates of State contribution. While not verifying the data at the source, the actuary performed tests for consistency and reasonability.

On the basis of the valuation, we have determined employer contribution rates of 12.59% of payroll for Tier I members and 11.44% of payroll for Tier II members for the fiscal year ending September 30, 2023.

The promised benefits of the System are included in the actuarially calculated contribution rates which are developed using the Entry Age Normal cost method. Five-year smoothed market value of assets is used for actuarial valuation purposes. Gains and losses are reflected in the unfunded actuarial accrued liability that is being amortized by regular annual contributions as a level percentage of payroll, on the assumption that payroll will increase by 3.00% annually. The assumptions recommended by the actuary and adopted by the Board are in the aggregate reasonably related to the experience under the System and to reasonable expectations of anticipated experience under the System. The assumptions and methods used for funding purposes meet the parameters outlined in the Board's funding policy.

In this report, we provided the following information and supporting schedules in the Actuarial and Statistical Sections of the Comprehensive Annual Financial Report:

- Summary of Actuarial Assumptions and Methods
- Actuarial Cost Method
- Summary of Plan Provisions as Interpreted for Valuation Purposes
- Schedule of Funding Progress
- Solvency Test
- Schedule of Active Member Valuation Data

We also provide the following schedules for the Comprehensive Annual Financial Report in a separate supplemental report:

- Analysis of Actuarial Gains and Losses
- Schedule of Retirants and Beneficiaries Added and Removed from Rolls
- Retired Members by Type of Benefit as of September 30, 2020
- Ten-Year History of Average Monthly Benefit Payments as of September 30

The necessary GASB Statement Nos. 67 and 68 disclosure information is provided in separate supplemental reports.

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April 16, 2021
Board of Control
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This is to certify that Larry Langer and Edward Koebel are members of the American Academy of Actuaries and have experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

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.

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 prior to the next experience study.

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 actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. Use of these computations for purposes other than meeting these requirements may not be appropriate.

In our opinion the System is operating on an actuarially sound basis. Assuming that contributions to the System are made by the employer from year to year in the future at the rates recommended on the basis of the successive actuarial valuations, the continued sufficiency of the retirement fund to provide the benefits called for under the System may be safely anticipated.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Respectfully submitted,

A handwritten signature in blue ink, appearing to be 'LL'.

Larry Langer, ASA, EA, FCA, MAAA
Principal and Consulting Actuary

A handwritten signature in blue ink, appearing to be 'Cathy Turcot'.

Cathy Turcot
Principal and Managing Director

A handwritten signature in blue ink, appearing to be 'Edward J. Koebel'.

Edward Koebel, EA, FCA, MAAA
Chief Executive Officer



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Section I: Summary of Principal Results

1. For convenience of reference, the principal results of the valuation and a comparison with the preceding year's results are summarized below:

VALUATION DATE	September 30, 2020	September 30, 2019
Active members		
Number	132,707	136,325
Annual compensation	\$ 7,019,258,383	\$ 7,193,832,116*
Retired members and beneficiaries		
Number	100,866	98,539
Annual allowances	\$ 2,350,717,232	\$ 2,266,860,064
Deferred vested members		
Number	6,606	6,019
Estimated deferred annual allowances	\$ 94,050,039	\$ 84,081,986
Assets		
Actuarial value	\$ 26,681,234,020	\$ 25,821,325,694
Market value	25,776,400,992	25,443,974,735
Unfunded actuarial accrued liability	\$ 11,071,566,401	\$ 11,394,143,677
Funded Ratio based on Actuarial Value of Assets	70.7%	69.4%
Blended Amortization period	27.1 years	27.8 years
CONTRIBUTIONS FOR FISCAL YEAR ENDING	September 30, 2023	September 30, 2022
Tier I (first hired prior to January 1, 2013)		
Employer contribution rate		
Normal	2.41%	2.35%
Unfunded actuarial accrued liability	9.82	9.72
Death benefit	0.01	0.01
Term life	0.02	0.02
Administration	0.33	0.33
Total	12.59%	12.43%
Tier II (first hired on or after January 1, 2013)		
Employer contribution rate		
Normal	1.26%	1.24%
Unfunded actuarial accrued liability	9.82	9.72
Death benefit	0.01	0.01
Term life	0.02	0.02
Administration	0.33	0.33
Total	11.44%	11.32%

*RSA implemented a new pension administration system for contribution reporting within this year, which resulted in larger than expected payroll amounts. This will not occur in subsequent years.





Section I: Summary of Principal Results

2. Comments on the valuation results as of September 30, 2020 are shown in Section IV and further discussion of the contribution levels is set out in Section V.
3. Section VI of this report shows the certification of the liquidation period used to determine the actuarial accrued liability contribution rate.
4. Schedule B shows the development of the actuarial value of assets.
5. Schedule D of this report outlines the full set of actuarial assumptions and methods used in the current valuation. There have been no changes since the previous valuation.
6. The Board's funding policy is provided in Schedule F.
7. Provisions of the System, as summarized in Schedule H, were taken into account in the current valuation. There have been no changes since the previous valuation.
8. The funded ratio shown in the Summary of Principal Results is the ratio of the 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 towards payment of the unfunded actuarial accrued liability. In addition, this funded ratio does not have any relationship to measuring sufficiency if the plan had to settle its liabilities.





Section II: Membership

1. The following table shows the number of active members and their annual compensation as of September 30, 2020 on the basis of which the valuation was prepared.

TABLE 1
THE NUMBER AND ANNUAL COMPENSATION OF
ACTIVE MEMBERS AS OF SEPTEMBER 30, 2020

GROUP	NUMBER	COMPENSATION
Tier I	83,742	\$ 4,848,710,476
Tier II	<u>48,965</u>	<u>2,170,547,907</u>
Subtotal	132,707	\$ 7,019,258,383

The table reflects the active membership for whom complete valuation data were submitted. The results of the valuation include an estimated liability for an additional 63 vested inactive members where complete data was not available (with liabilities equal to contribution balances multiplied by a factor of two) and contribution balances for 17,986 non-vested inactive members who have contributed in the last 5 years and 30,490 non-vested inactive members who have not contributed for more than 5 years.

2. The following table shows a six-year history of active member valuation data.

TABLE 2
SCHEDULE OF ACTIVE MEMBER VALUATION DATA

<u>Valuation Date</u>	<u>Number</u>	<u>Annual Payroll</u>	<u>% Increase in Annual Payroll*</u>	<u>Annual Average Pay</u>	<u>% Increase in Average Pay**</u>
9/30/2020 ¹	132,707	\$ 7,019,258,383	(2.43)%	\$ 52,893	0.23%
9/30/2019 ¹	136,325	7,193,832,116	6.47	52,770	7.13
9/30/2018 ¹	137,161	6,756,474,151	0.86	49,259	0.70
9/30/2017 ¹	136,941	6,698,834,819	4.20	48,918	4.00
9/30/2016 ¹	136,731	6,430,999,445	2.11	47,034	1.56
9/30/2015 ²	135,986	6,297,938,621	1.34	46,313	1.48

* 2.19% annual increase for Annual Payroll since 2015.

** 2.69% annual increase for Average Pay since 2015.

¹ There are no employees currently participating in the DROP program.

² In addition, there are 699 employees with annual compensation of \$52,847,343 who are currently participating in the DROP program. Employers of the Retirement System contribute on this payroll.





Section II: Membership

3. The following table shows the number and annual retirement allowances payable to retired members and their beneficiaries on the roll of the Retirement System as of the valuation date.

TABLE 3

**THE NUMBER AND ANNUAL RETIREMENT ALLOWANCES OF
RETIRED MEMBERS AND BENEFICIARIES ON THE ROLL
AS OF SEPTEMBER 30, 2020**

GROUP	NUMBER*	ANNUAL RETIREMENT ALLOWANCES*
Service Retirements	89,196	\$ 2,187,349,142
Disability Retirements	5,958	71,133,854
Beneficiaries of Deceased Members	<u>5,712</u>	<u>92,234,236</u>
Total	100,866	\$ 2,350,717,232

** In addition, there were 6,606 vested inactive members with estimated deferred annual allowances totaling \$94,050,039 included in the valuation.*

4. Schedule I shows the distribution by age and service of the number and average annual compensation of active members included in the valuation and a distribution by age of the number and benefits of retired members and beneficiaries included in the valuation.





Section III: Assets

1. The current retirement law provides for the maintenance of six funds for the purpose of recording the fiscal transactions of the System, namely, the Annuity Savings Fund, the Pension Accumulation Fund, the Deferred Retirement Option Plan Fund, the Pre-Retirement Death Benefit Fund, the Life Insurance Fund and the Expense Fund.

(a) Annuity Savings Fund

The Annuity Savings Fund is the fund to which are credited all contributions made by members together with regular interest thereon. When a member retires or when a survivor allowance becomes payable the amount of the member's accumulated contributions are transferred from the Annuity Savings Fund to the Pension Accumulation Fund. The market value of assets credited to the Annuity Savings Fund on September 30, 2020, which represent the accumulated contributions of active members to that date, including interest, amounted to \$6,356,922,185.

(b) Pension Accumulation Fund

The Pension Accumulation Fund is the fund to which are credited all contributions made by the employer, except those contributions made to the Pre-Retirement Death Benefit Fund, the Life Insurance Fund or the Expense Fund. When a member retires or when a survivor allowance becomes payable, the pension is paid from this fund. In addition, the amount of the member's accumulated contributions is transferred from the Annuity Savings Fund to the Pension Accumulation Fund and the annuity is paid from this fund. On September 30, 2020 the market value of assets credited to this fund amounted to \$19,286,298,071.

(c) DROP Fund

The DROP Fund is the fund to which are credited deferred retirement benefits on behalf of members who elect to participate in the DROP, together with regular interest thereon. In addition, member contributions while participating in the DROP, together with regular interest therein, are credited to the Fund. At the end of the DROP deferral period, the member receives the amount of the deferred retirement benefits and contributions plus interest in the member's DROP account. The DROP is closed to new participants as of June 1, 2011. On September 30, 2020, the market value of assets credited to this Fund amounted to \$133,180,736.

(d) Pre-Retirement Death Benefit Fund

The Pre-Retirement Death Benefit Fund is the fund to which are credited contributions made by the employer for the special pre-retirement death benefit which became effective October 1, 1983. On September 30, 2020, the market value of assets credited to this fund amounted to \$53,291,263. These assets are not included in the valuation and the liabilities associated with these death benefits are not included in the valuation.





Section III: Assets

(e) Life Insurance Fund

The Life Insurance Fund is the fund to which are credited contributions made by the employer for life insurance benefits which became effective October 1, 1987. On September 30, 2020, the market value of assets credited to this fund amounted to \$7,229,332. These assets are not included in the valuation and the liabilities associated with these life insurance benefits are not included in the valuation.

(f) Expense Fund

The Expense Fund is the fund from which the expenses of the administration of the retirement system are paid. Any amounts credited to the accounts of members withdrawing before retirement and not returnable under the provisions of subsection (g) of Section 16-25-14 are credited to the Expense Fund. Additional contributions required to meet the expenses of the retirement system made by the employer are also credited to this fund. On September 30, 2020, the market value of assets credited to this fund amounted to \$5,009,319. These assets are not included in the valuation.

2. As of September 30, 2020, the total market value of assets reported exclusive of the Pre-Retirement Death Benefit Fund, the Life Insurance Fund and the Expense Fund amounted to \$25,776,400,992 as shown in the following table.

TABLE 4
MARKET VALUE OF ASSETS BY FUND
AS OF SEPTEMBER 30, 2020

FUND	MARKET VALUE OF ASSETS
Annuity Savings Fund	\$ 6,356,922,185
Pension Accumulation Fund	19,286,298,071
DROP Fund	<u>133,180,736</u>
Total Market Value of Assets	\$ 25,776,400,992

3. The five-year market related actuarial value of assets as of September 30, 2020 was \$26,681,234,020. Schedule B shows the development of the actuarial value of assets as of September 30, 2020.
4. Schedule C shows the receipts and disbursements of the System for the year preceding the valuation date and a reconciliation of the fund balances at market value.





Section IV: Comments on Valuation

1. Schedule A of this report contains the valuation balance sheet, which shows the present and prospective assets and liabilities of the System as of September 30, 2020.
2. The valuation balance sheet shows that the System has total prospective liabilities of \$42,453,460,849. Of this amount, \$21,781,149,238 is for the prospective benefits payable on account of present retired members, beneficiaries of deceased members, and DROP participants, \$823,794,244 is for the prospective benefits payable on account of present inactive members and \$19,848,517,367 is for the prospective benefits payable on account of present active members. Against these liabilities, the System has total actuarial value of assets, exclusive of the Pre-Retirement Death Benefit Fund, the Life Insurance Fund and the Expense Fund, of \$26,681,234,020 as of September 30, 2020. The difference of \$15,772,226,829 between the total liabilities and the total actuarial value of assets represents the present value of contributions to be made in the future. Of this amount, \$3,658,484,957 is the present value of future contributions expected to be made by members to the Annuity Savings Fund, and the balance of \$12,113,741,872 represents the present value of future contributions payable by the employer.
3. The employer's regular contributions to the System consist of normal contributions and unfunded actuarial accrued liability (UAAL) contributions. The valuation indicates that employer normal contributions at the rate of 2.41% of payroll for Tier I members and 1.26% of payroll for Tier II members are required to provide the benefits of the System.
4. Prospective normal contributions have a present value of \$1,042,175,471. When this amount is subtracted from \$12,113,741,872, which is the present value of the total future contributions to be made by the employer, there remains \$11,071,566,401 as the amount of future UAAL contributions.





Section IV: Comments on Valuation

5. The funding policy adopted by the Board, as shown in Schedule F, provides that one-fifteenth of the unfunded actuarial accrued liability as of September 30, 2012 (Transitional UAAL) will be amortized as a level percent of payroll over a closed period. The closed period shall be the amortization period for the September 30, 2012 valuation, not to exceed 30 years. The remaining Transitional UAAL each year will be amortized over an open period. The open period shall be the amortization period for the September 30, 2012 valuation, not to exceed 30 years. Each year the new closed transitional base is calculated by dividing the remaining transitional UAAL at the beginning of the year by a declining value from 15 initially to 1 in the year 2026. After 15 years, the entire Transitional UAAL will be closed. 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 determine a New Incremental UAAL. Each New Incremental UAAL will be amortized as a level percent of payroll over a closed 30-year period from the date it is established, except for benefit improvements, which will be amortized over a closed period not to exceed 15 years.
6. The total UAAL contribution rate is 9.82% of payroll determined in accordance with the Board's funding policy. The UAAL contribution rate has been calculated on the assumption that the aggregate amount of actuarial accrued liability contribution will increase by 3.00% each year. Schedule G of this report shows a projection of the open Transitional UAAL, the calculation of the closed transitional bases and amortization schedules for all closed bases on September 30, 2020.





Section IV: Comments on Valuation

7. The following table shows the components of the total unfunded actuarial accrued liability (UAAL) and the derivation of the actuarial accrued liability contribution rate in accordance with the funding policy.

TABLE 5
TOTAL UAAL AND UAAL CONTRIBUTION

	<u>UAAL</u>	<u>Amortization Period</u>	<u>Amortization Payment</u>
Open Transitional	\$4,257,152,778	30	\$271,195,855
Closed Transitional 9/30/2012	685,411,281	22	51,517,473
Closed Transitional 9/30/2013	691,919,610	23	50,681,372
Closed Transitional 9/30/2014	697,280,826	24	49,858,959
Closed Transitional 9/30/2015	701,575,301	25	49,050,006
Closed Transitional 9/30/2016	704,878,436	26	48,254,290
Closed Transitional 9/30/2017	707,261,197	27	47,471,608
Closed Transitional 9/30/2018	708,790,157	28	46,701,758
Closed Transitional 9/30/2019	709,525,463	29	45,944,392
Closed Transitional 9/30/2020	709,525,463	30	45,199,309
New Incremental 9/30/2013	453,911,805	23	33,247,899
New Incremental 9/30/2014	(178,372,023)	24	(12,754,464)
New Incremental 9/30/2015	(84,738,874)	25	(5,924,442)
New Incremental 9/30/2016	250,314,279	26	17,135,916
New Incremental 9/30/2017	163,439,599	27	10,970,120
New Incremental 9/30/2018	(318,607,393)	28	(20,992,850)
New Incremental 9/30/2019	659,343,561	29	42,694,929
New Incremental 9/30/2020	<u>(447,045,065)</u>	30	<u>(28,478,369)</u>
Total	\$11,071,566,401		\$741,773,761
Total Amortized Payment Adjusted for Timing			\$714,274,204
Total Estimated Payroll*			\$7,275,785,844
UAAL Contribution Rate			9.82%

* Estimated payroll based on applying the assumed salary scale to current salaries.

8. The Pre-Retirement Death Benefit Program (PRDB) was established October 1, 1983 under Alabama Code Section 36-27B. The liabilities and assets associated with the PRDB are not included in the annual actuarial valuation of the System; however, the sufficiency of the Fund to provide the promised benefits is reviewed annually. The contribution requirements are determined every five years during our experience investigation. A contribution of 0.01% is required to meet the cost of the pre-retirement death benefit program this year.





Section IV: Comments on Valuation

9. The Term Life Insurance fund was established under Alabama Code Section 16-25-33. The liabilities and assets associated with the term life insurance benefit are not included in the annual actuarial valuation of the System; however, the sufficiency of the Fund to provide the promised benefits is reviewed annually. The contribution requirements are determined every five years during our experience investigation. A contribution of 0.02% is required to meet the cost of life insurance premiums.
10. An additional contribution of 0.33% of payroll is required to cover the expenses of administering the System.
11. In our opinion, the current experience, assumptions and methods adopted by the Board support the funding policy and generally accepted and emerging practice. Assuming that required contributions continue to be made each year, the funding of the System will continue to remain on track.





Section V: Contributions Payable By Employer

1. The retirement law provides that the employer contributions are to be paid from the same source from which employees' salaries are paid.
2. On the basis of the actuarial valuation prepared as of September 30, 2020 it is recommended that the employer make contributions at the following rates beginning October 1, 2022:

TABLE 6
EMPLOYER CONTRIBUTION RATES
AS A PERCENTAGE OF MEMBERS' COMPENSATION*

<u>EMPLOYER CONTRIBUTION RATE</u>	<u>FISCAL YEAR ENDING SEPTEMBER 30, 2023</u>	
	<u>Tier I</u>	<u>Tier II</u>
Employer Normal Cost**	2.41%	1.26%
Unfunded Actuarial Accrued Liability	9.82	9.82
Death Benefit	0.01	0.01
Term-Life	0.02	0.02
Administration	<u>0.33</u>	<u>0.33</u>
Total	12.59%	11.44%

* All members initially joining the System on and after January 1, 2013 are Tier II members.

** The total Normal Cost rate is 9.91% for Tier I and 7.26% for Tier II. Tier I members contribute 7.50% (8.50% for FLC members) and Tier II members contribute 6.00% (7.00% for FLC members).





Section VI: Annual Actuarial Certification

The following is the annual actuarial certification to the Teachers' Retirement System of Alabama required by Act 2000-732.

1. We hereby certify that there has been a change since the previous valuation in the liquidation period used to determine the actuarial accrued liability contribution rate from 27.8 years to 27.1 years. The unfunded actuarial accrued liability rate of 9.82% to be paid by employers to the Teachers' Retirement System of Alabama has been determined in accordance with the Funding Policy adopted by the Board and shown in Schedule F of this report.

A handwritten signature in blue ink, appearing to be 'LL', written over a horizontal line.

Signed _____

Larry Langer, ASA, EA, FCA, MAAA
Principal and Consulting Actuary





Section VII: Analysis of Financial Experience

1. The calculation of the System's liabilities and actuarial value of assets requires the use of several assumptions concerning the future experience of the System and its members. In each annual actuarial valuation, the experience of the System is compared with what was expected based on the actuarial assumptions. The differences between the actual and expected experience are called actuarial gains or losses depending on whether the difference increases or decreases the UAAL. The UAAL decreased from \$11,394,143,677 on September 30, 2019 to 11,071,566,401 on September 30, 2020. The most significant item contributing to the decrease in the UAAL was the gain due to salary increases less than anticipated. Other sources of gains and losses were relatively small; however, we have noticed a trend of losses developing due to withdrawal experience that we will review in the upcoming experience study.
2. The following tables show the reconciliation of the UAAL of the System and a breakdown by source of the actuarial gains and losses. These sources include the expected return on assets, salary increases, retirement, withdrawal, disability, and mortality.





Section VII: Analysis of Financial Experience

RECONCILIATION OF THE UNFUNDED ACTUARIAL ACCRUED LIABILITY FOR THE YEAR ENDING SEPTEMBER 30, 2020

(Dollar amounts in thousands)

(1) UAAL at beginning of year	\$ 11,394,144
(2) Total normal cost at beginning of the year	620,513
(3) Actual contributions	1,351,850
(4) Interest accrual: $[(1) + (2)] - \frac{1}{2} [(3)] \times 0.07700$	873,082
(5) Expected UAAL before changes: $(1) + (2) - (3) + (4)$	11,535,889
(6) Increase from benefit changes	0
(7) Changes from revised actuarial assumptions and methods	0
(8) Expected UAAL after changes: $(5) + (6) + (7)$	11,535,889
(9) Actual UAAL at end of year	11,071,566
(10) (Gain)/Loss: $(9) - (8)$	\$ (464,323)

DEVELOPMENT OF (GAIN)/LOSS FROM INVESTMENT RETURN FOR THE YEAR ENDING SEPTEMBER 30, 2020

(Dollar amounts in thousands)

(1) Actuarial Value of Assets (BOY)	\$ 25,821,326
(2) Net Cash Flow	(1,038,760)
(3) Expected Return $[(1) + \frac{1}{2} [(2)]] \times 0.07700$	1,948,250
(4) Expected Actuarial Value of Assets $[(1) + (2) + (3)]$	26,730,816
(5) Actual Actuarial Value of Assets (EOY)	26,681,234
(6) (Gain)/Loss: $(4) - (5)$	\$ 49,582





Section VII: Analysis of Financial Experience

**(GAINS)/LOSSES BY SOURCE
FOR THE YEAR ENDING SEPTEMBER 30, 2020**
(Dollar amounts in thousands)

SOURCE	Total	% of Actuarial Accrued Liability
Age and Service Retirements. Generally, earlier retirements cause losses and later retirements cause gains.	\$ (39,224)	(0.10)%
Withdrawal. More withdrawals than expected usually cause gains and fewer withdrawals than expected cause losses.	22,293	0.06%
Disability Retirements. More disabilities than expected generally cause losses and fewer disabilities than expected cause gains.	1,231	0.00%
Death-In-Service Benefits. If survivor claims are less than assumed, there is a gain. If claims are greater than assumed, there is a loss.	4,611	0.01%
Salary Increases. If salaries increase more than expected, there is a loss. If salaries increase less than expected, there is a gain.	(516,747)	(1.37)%
New Members/Rehires. Any past service causes losses.	17,306	0.05%
Retiree Mortality. More deaths than expected cause gains, fewer than expected cause losses.	179	0.00%
Investment Return. Investment income greater than expected causes gains while investment income less than expected cause losses.	49,582	0.13%
Other. Miscellaneous gains and losses resulting from data corrections, timing of financial transactions, unit transfers, changes in valuation software, etc.	(3,554)	(0.01)%
Total (Gain)/Loss	\$ (464,323)	(1.23)%





Section VII: Analysis of Financial Experience

(GAINS)/ LOSSES BY SOURCE
Historical Trends
(Dollar amounts in thousands)

SOURCE	September 30			
	2020	2019	2018	2017
Age and Service Retirements	\$ (39,224)	\$ 5,637	\$ (5,683)	\$ 8,651
Withdrawal	22,293	29,495	30,805	75,236
Disability Retirements	1,231	3,557	2,979	3,170
Death-In-Service Benefits	4,611	4,205	7,054	14,960
Salary Increases	(516,747)	592,855	(245,066)	175,807
New Members/Rehires	17,306	21,617	22,534	27,797
Retiree Mortality	179	9,712	8,480	(8,515)
Investment Return	49,582	149,503	(275,913)	(412,731)
Other	(3,554)	(80,098)	(21,610)	(67,116)
Total (Gain)/Loss	\$ (464,323)	\$ 736,483	\$ (476,420)	\$ (182,741)





Section VIII: Accounting Information

The information required under Governmental Accounting Standard Board (GASB) Statements No. 67 and 68 will be issued in separate reports. The following information is provided for informational purposes only.

1. The following is a distribution of the number of employees by type of membership.

NUMBER OF ACTIVE AND RETIRED MEMBERS AS OF SEPTEMBER 30, 2020

GROUP	NUMBER
Retirees and beneficiaries currently receiving benefits	100,866
Terminated employees entitled to benefits but not yet receiving benefits	24,655
Non-vested inactive members who have not contributed for more than 5 years	30,490
Active members	<u>132,707</u>
Total	288,718

2. The schedule of funding progress is shown below.

SCHEDULE OF FUNDING PROGRESS (Dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b - a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a) / c)
9/30/2015	\$21,740,280	\$31,844,843	\$10,104,563	68.3%	\$6,350,786	159.1%
9/30/2016 ¹	22,645,512	33,143,834	10,498,322	68.3	6,430,999	163.2
9/30/2017 ²	23,887,077	34,688,078	10,801,001	68.9	6,698,835	161.2
9/30/2018 ²	25,006,419	35,628,398	10,621,979	70.2	6,756,474	157.2
9/30/2019	25,821,326	37,215,470	11,394,144	69.4	7,193,832	158.4
9/30/2020	26,681,234	37,752,800	11,071,566	70.7	7,019,258	157.7

¹Reflects changes in actuarial assumptions and methods.

²Reflects changes in actuarial assumptions.





Section VIII: Accounting Information

3. The information presented above was determined as part of the actuarial valuation at September 30, 2020. Additional information as of the latest actuarial valuation follows.

Valuation date	09/30/2020
Actuarial cost method	Entry Age Normal
Amortization method	Level percent closed
Single equivalent remaining amortization period	27.1 years
Asset valuation method	Five-year market related value
Actuarial assumptions:	
Investment Rate of Return*	7.70%
Projected salary increases*	3.25 - 5.00%
Cost-of-living adjustments	None
*Includes price inflation at	2.75%





Section IX: Risk Assessment

Overview

Actuarial Standards of Practice (ASOP) No. 51, issued by the Actuarial Standards Board, provides guidance on assessing and disclosing risks related to pension plan funding. This guidance is binding on all credentialed actuaries practicing in the United States. This standard was issued as final in September 2017 with application to measurement dates on or after November 1, 2018.

The term “risk” frequently has a negative connotation, but from an actuarial perspective, it can simply be considered that what actually happens in the real world will not always match what was expected, based on actuarial assumptions. Of course, when actual experience is better than expected, the favorable risk is easily absorbed. The risk of unfavorable experience will likely be unpleasant, and so understandably, there is a focus on aspects of risk that are negative.

Risk can usually be reduced or eliminated at some cost. Consumers, for example, buy auto and home insurance to reduce the risk of accidents or catastrophes. Another way to express this concept, however, is that there is generally some reward for assuming risk. Thus, retirement plans invest not just in US Treasury bonds, which have almost no risk, but also in equities, which are considerably riskier – because they have an expected reward of a higher return that justifies the risk.

Under ASOP 51, the actuary is called upon to identify the significant risks to the pension plan and provide information to help those sponsoring and administering the plan understand the implications of these risks. In this section, we identify some of the key risks for the System and provide information to help interested parties better understand these risks.





Section IX: Risk Assessment

Investment Risk

The investment return on assets is the most obvious risk – and usually the largest risk – to funding a pension plan. To illustrate the magnitude of this risk, the following chart shows the Asset Volatility Ratio (AVR), defined as the fair value of assets divided by covered payroll.

(\$ in thousands)

Valuation	Fair Value of Assets	Covered Payroll	Asset Volatility Ratio
2015	\$21,574,653	\$6,350,786	3.40
2016	\$22,758,954	\$6,430,999	3.54
2017	\$24,467,518	\$6,698,835	3.65
2018	\$25,756,495	\$6,756,474	3.81
2019	\$25,443,975	\$7,193,832	3.54
2020	\$25,776,401	\$7,019,258	3.67

The asset volatility ratio is especially useful to compare across plans or through time. It is also frequently useful to consider how the AVR translates into changes in the Required Contribution Rate (actuarially determined employer contribution rate). The greater the AVR, the more volatility there is in the Required Contribution Rate. For plans with low AVRs, the impact of investment gains and losses on Required Contribution Rates is less than for plans with high AVRs. The AVR for TRS at September 30, 2020 is 3.67. As shown in the table below, if the market value return is 5% below assumed, or 2.70% (7.70% minus 5.00%) for the System, there will be an increase in the Required Contribution Rate of 0.23% of payroll in the first year. Without asset smoothing or without returns above the expected return in the next four years, the impact on the Required Contribution Rate would be 1.13%.

Investment Rate of Return 5% Less Than Assumed		
AVR	Unsmoothed Amortization	Smoothed Amortization
3.00	0.93%	0.19%
3.67	1.13%	0.23%
5.00	1.55%	0.31%





Section IX: Risk Assessment

Sensitivity Measures

Valuations are generally performed with a single set of assumptions that reflects the best estimate of future conditions, in the opinion of the actuary and typically the governing board. Note that under actuarial standards of practice, the set of economic assumptions used for funding must be consistent. To enhance the understanding of the importance of an assumption, a sensitivity test can be performed where the valuation results are recalculated using a different assumption or set of assumptions.

The following tables contains the key measures for the System using the valuation assumption for investment return of 7.70%, along with the results if the assumption were 6.70% or 8.70%. In this analysis, only the investment return assumption is changed. Consequently, there may be inconsistencies between the investment return and other economic assumptions such as inflation or payroll increases. In addition, simply because the valuation results under alternative assumptions are shown here, it should not be implied that CMC believes that either assumption (6.70% or 8.70%) would comply with actuarial standards of practice.

(\$ in thousands)

As of September 30, 2019	Current Discount Rate (7.70%)	-1% Discount Rate (6.70%)	+1% Discount Rate (8.70%)
Accrued Liability	\$37,752,800	\$41,841,583	\$34,293,771
Unfunded Liability	\$11,071,566	\$15,160,349	\$7,612,537
Funded Ratio (AVA)	70.7%	63.8%	77.8%
ADEC Rate*			
Tier I	12.59%	16.95%	8.64%
Tier II	11.44%	15.05%	8.07%

* Contribution rates are determined based on the Board's current Funding Policy





Section IX: Risk Assessment

Mortality Risk

The mortality assumption is a significant assumption for valuation results, second only to the investment assumption in most situations. The System's mortality assumption utilizes a mortality table (with separate rates for males and females, as well as different rates by status) and a projection scale for how the mortality table is expected to improve through time.

The future, however, is unknown, and actual mortality improvements may occur at a faster rate than expected, or at a slower rate than expected. Although changes in mortality will affect the benefits paid, this assumption is reviewed carefully during the regular experience studies that the System conducts so that incremental changes can be made to smoothly reflect emerging experience. The next actuarial experience study will be for the period from October 1, 2015 – September 30, 2020.

Contribution Risk

The System is funded primarily by member and employer contributions to the trust fund, together with the earnings on those accumulated contributions. Each year in the valuation, the Actuarial Determined Employer Contribution (ADEC) rate is determined, based on the System's funding policy. This rate is the sum of the rates for the normal cost for the plan (which includes expected administrative expenses), and the rate necessary to amortize the UAAL. Since the level percentage of payroll method is used to determine the UAAL amortization amounts, there is an expectation that future payments will grow at the assumed 3.00% annual rate of increase in covered payroll. If payroll grows at a slower rate, under this amortization method, less than expected UAAL amortization payments would result in a greater UAAL in future years and may require increases to either the amortization rate or the amortization period. From a policy perspective, since the ADEC rate has always been made by the plan sponsors, and that procedure is expected to continue, there is no risk to the System associated with the contribution amounts being less than the ADEC.





Schedule A: Valuation Balance Sheet & Solvency Test

**VALUATION BALANCE SHEET
SHOWING THE PRESENT AND PROSPECTIVE ASSETS AND LIABILITIES OF
THE TEACHERS' RETIREMENT SYSTEM OF ALABAMA
AS OF SEPTEMBER 30, 2020**

ASSETS	
Actuarial Value of Assets	\$ 26,681,234,020
Present value of future members' contributions to the Annuity Savings Fund	\$ 3,658,484,957
Present value of future employer contributions to the Pension Accumulation Fund	
Normal contributions	\$ 1,042,175,471
Unfunded actuarial accrued liability contributions	<u>11,071,566,401</u>
Total prospective employer contributions	\$ 12,113,741,872
Total Assets	<u>\$ 42,453,460,849</u>
LIABILITIES	
Present value of benefits payable on account of retired members, beneficiaries of deceased members now drawing retirement allowances, and DROP participants	
Service Retirements	\$ 20,305,453,014
Disability Retirements	617,184,346
Beneficiaries of Deceased Members	725,331,142
DROP Participant Accounts	<u>133,180,736</u>
Total	\$ 21,781,149,238
Inactive Members	\$ 753,918,030
Inactive T-Section Accounts	\$ 69,876,214
Present value of prospective benefits payable on account of present active members:	
Service retirement allowances	\$ 17,838,233,791
Disability retirement allowances	787,158,268
Death Benefits	128,887,516
Termination Benefits	<u>1,094,237,792</u>
Total	\$ 19,848,517,367
Total Liabilities	<u>\$ 42,453,460,849</u>





Schedule A: Valuation Balance Sheet & Solvency Test

SOLVENCY TEST (Dollar amounts in thousands)

Valuation Date	Aggregate Accrued Liabilities For			Reported Assets	Portion of Accrued Liabilities Covered by Reported Asset		
	(1) Active Member Contributions	(2) Retirants and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
9/30/2020	\$6,356,922	\$21,781,149	\$9,614,729	\$26,681,234	100%	93%	0.0%
9/30/2019	6,100,489	21,093,665	10,021,316	25,821,326	100	93	0.0
9/30/2018 ¹	5,788,187	20,511,811	9,328,400	25,006,419	100	94	0.0
9/30/2017 ¹	5,504,125	19,886,016	9,297,937	23,887,077	100	92	0.0
9/30/2016 ²	5,197,469	19,257,160	8,689,205	22,645,512	100	91	0.0
9/30/2015	4,894,145	18,621,250	8,329,448	21,740,280	100	90	0.0

¹ Reflects changes in actuarial assumptions.

² Reflects changes in actuarial assumptions and methods.





Schedule B: Actuarial Value of Assets

DEVELOPMENT OF SEPTEMBER 30, 2020 ACTUARIAL VALUE OF ASSETS

(1)	Actuarial Value of Assets on September 30, 2019	\$ 25,821,325,694
(2)	Market Value of Assets on September 30, 2020	25,776,400,992
(3)	Market Value of Assets on September 30, 2019	25,443,974,735
(4)	Net Cash Flow During the Fiscal Year	
	a. Contributions	1,351,850,198
	b. Benefit Payments and DROP Distributions	2,329,042,862
	c. Refunds to Members	61,567,469
	d. Transfer to Expense Fund – Interest Forfeiture	0
	e. Investment Expenses	<u>17,269,555</u>
	f. Net Cash Flow: (a. - b. - c. - d. - e.)	(1,056,029,688)
(5)	Actual Investment Return ((2) - (3) - (4)f.)	1,388,455,945
(6)	Assumed Rate of Return on Assets	7.700%
(7)	Amount for Immediate Recognition ((3) * (6)) + (((4)a. - (4)b. - (4)c. - (4)d.) * 0.5 * (6)) + (4)e.	1,936,463,344
(8)	Investment Gain/(Loss) for the Fiscal Year ((5) - (7))	(548,007,399)
(9)	Phased-In Recognition of Investment Gain/(Loss)	
	a. Current Fiscal Year: (0.2 * (8))	(109,601,480)
	b. Prior Fiscal Year	(266,937,275)
	c. Second Prior Fiscal Year	80,112,762
	d. Third Prior Fiscal Year	174,159,190
	e. Fourth Prior Fiscal Year	<u>101,741,473</u>
	f. Total Recognized Investment Gain/(Loss) for Fiscal Year	(20,525,330)
(10)	Actuarial Value of Assets on September 30, 2020 (1) + (4)f. + (7) + (9)f.)	\$ 26,681,234,020

<u>Date</u>	<u>Investment Gain/(Loss)</u>	<u>Amount Recognized</u>	<u>Remaining Balance as of September 30, 2020</u>
9/30/2016	\$ 508,707,363	\$ 508,707,363	\$ 0
9/30/2017	870,795,950	696,636,760	174,159,190
9/30/2018	400,563,810	240,338,286	160,225,524
9/30/2019	(1,334,686,373)	(533,874,550)	(800,811,823)
9/30/2020	(548,007,399)	(109,601,480)	(438,405,919)





Schedule C: Summary of Receipts & Disbursements

FOR THE PERIOD ENDING SEPTEMBER 30, 2020

<u>Receipts for the Period</u>		
Contributions:		
Members	\$ 515,002,973	
Employer	<u>836,847,225</u>	
Total		\$ 1,351,850,198
Investment Income		<u>1,384,075,056*</u>
TOTAL		\$ 2,735,925,254
<u>Disbursements for the Period</u>		
Benefit Payments		\$ 2,293,493,506
Refunds to Members		61,567,469
DROP Distributions		35,549,356
Miscellaneous:		
Transfers from Plant Fund	\$ 0	
Transfers to Expense Fund –Interest Forfeiture	0	
Transfers to Expense Fund –Investment Expenses	9,718,555	
Transfers to Pre-retirement Death Benefit Fund	<u>3,170,111</u>	
Total		<u>12,888,666</u>
TOTAL		\$ 2,403,498,997
<u>Excess of Receipts over Disbursements</u>		\$ 332,426,257
<u>Reconciliation of Asset Balances</u>		
Market Value of Assets as of September 30, 2019		\$ 25,443,974,735
Excess of Receipts over Disbursements		<u>332,426,257</u>
Market Value of Assets as of September 30, 2020		<u>\$ 25,776,400,992</u>

* Net of \$7,551,000 in investment expenses.





Schedule D: Outline of Actuarial Assumptions & Methods

The assumptions and methods used in the valuation were selected based on the actuarial experience study prepared as of September 30, 2015, submitted to and adopted by the Board on September 13, 2016. The discount rate of 7.70% was subsequently adopted by the Board of Trustees on December 4, 2018.

INVESTMENT RATE OF RETURN: 7.70% per annum, compounded annually, including price inflation at 2.75%.

SALARY INCREASES: Representative values of the assumed annual rates of future salary increases are as follows and include wage inflation at 3.00% per annum:

Service	Annual Rate
0	5.00 %
1-5	4.00
6-10	3.75
11-15	3.50
16 & Over	3.25





Schedule D: Outline of Actuarial Assumptions & Methods

SEPARATIONS BEFORE SERVICE RETIREMENT: Representative values of the assumed annual rates of death, disability, and withdrawal are as follows:

Age	Annual Rate of						
	Death*	Disability**				Withdrawal***	
		Tier I		Tier II		Years of Service	
		Years of Service		Years of Service		Years of Service	
	10-24	25+	10+	0-4	5-9	10-19	20+
Male							
20	0.0293%	0.0008%		0.0008%	25.00%		
25	0.0319	0.0250		0.0250	14.80	11.00%	
30	0.0376	0.0425		0.0425	13.80	5.40	3.50%
35	0.0655	0.1300		0.1300	13.50	5.40	2.50
40	0.0914	0.1700		0.1700	13.00	5.40	2.25
45	0.1278	0.2700	0.2000%	0.2700	13.00	5.40	2.25
50	0.1812	0.6000	0.2000	0.6000	12.00	5.00	2.50
55	0.2567	0.9000	0.2000	0.9000	11.50	5.00	2.50
60	0.3815	0.5000	0.5000	1.3000	12.00	4.50	2.50
65	0.5353	0.5000	0.5000	0.5000	12.00	6.00	
69	0.6326	0.5000	0.5000	0.5000	12.00	6.25	
Female							
20	0.0108%	0.0100%		0.0100%	25.00%		
25	0.0117	0.0275		0.0275	12.75	9.00%	
30	0.0149	0.0425		0.0425	13.50	5.80	4.30%
35	0.0268	0.1000		0.1000	13.50	5.00	2.60
40	0.0399	0.2000		0.2000	11.50	4.75	2.00
45	0.0635	0.3500	0.2000%	0.3500	10.75	4.10	2.00
50	0.0947	0.6500	0.2000	0.6500	10.75	3.90	2.20
55	0.1371	1.0500	0.2000	1.0500	11.00	4.20	2.40
60	0.1929	0.5000	0.5000	1.4000	12.00	4.50	2.70
65	0.2743	0.5000	0.5000	0.5000	15.00	6.75	
69	0.3435	0.5000	0.5000	0.5000	15.00	7.25	

*Rates of pre-retirement mortality are according to the sex distinct RP-2000 Employee Mortality Table (with the sex distinct RP-2000 Combined Mortality Table used for ages over 70) projected with Scale BB to 2020 with an adjustment factor of 90% for males and 60% for females.

**No rates of disability are assumed for members with less than 10 years of service.

***No rates of withdrawal are assumed after eligibility for service retirement.





Schedule D: Outline of Actuarial Assumptions & Methods

SERVICE RETIREMENT:

The assumed annual rates of service retirement for **Tier I** members are as follows:

For members upon attaining 25 years of service, rates are as follows:

Age Group	Annual Rate	
	Male*	Female**
47 & Under	25.0%	28.0%
48	25.0	20.0
49	20.0	17.0
50	16.5	13.0
51 to 53	16.0	15.0
54	16.0	17.0
55	16.0	18.0
56-57	16.0	19.0
58	16.0	21.0
59	20.0	22.0
60	20.0	30.0
61	20.0	27.5
62	35.0	45.0
63	30.0	35.0
64	23.0	32.0
65	28.0	38.0
66	27.0	40.0
67	22.0	35.0
68	22.0	37.0
69 to 70	22.0	30.0
71-74	20.0	30.0
75	100.0	100.0

*For males, retirement rates are increased by 5% in the year first attaining 25 years of service from age 51 through age 60.

**For females, retirement rates are increased by 9% in the year first attaining 25 years of service from age 50 through age 59.





Schedule D: Outline of Actuarial Assumptions & Methods

For members first eligible for unreduced benefits before attaining 25 years of service, the rates are as follows:

Age Group	Annual Rate	
	Male	Female
60	12.5%	17.0%
61	11.0	13.5
62	25.0	23.5
63	18.5	18.0
64	15.0	17.0
65	28.0	28.0
66	27.0	28.0
67	22.0	23.0
68	22.0	27.0
69	22.0	22.0
70	22.0	26.0
71 to 74	20.0	24.0
75 & Above	100.0	100.0

The assumed annual rates of service retirement for **Tier II** members are as follows:

Age Group	Annual Rate			
	Male*		Female**	
	Less than 25 years of service	25 or more years of service	Less than 25 years of service	25 or more years of service
62	50.0%	60.0%	50.0%	70.0%
63	18.5	30.0	18.0	35.0
64	15.0	23.0	17.0	32.0
65	28.0	28.0	28.0	38.0
66	27.0	27.0	28.0	40.0
67	22.0	22.0	23.0	35.0
68	22.0	22.0	27.0	37.0
69	22.0	22.0	22.0	30.0
70	22.0	22.0	26.0	30.0
71 to 74	20.0	20.0	24.0	30.0
75 & above	100.0	100.0	100.0	100.0

* For FLC Tier II members, rates on or after age 60 are the same as those for Tier I, while rates from ages 56 to 59 are equal to 0.20 for service less than 25 years and 0.30 for service greater than or equal to 25 years.

** For FLC Tier II members, rates on or after age 60 are the same as those for Tier I, while rates from ages 56 to 59 are equal to 0.20 for service less than 25 years and 0.40 for service greater than or equal to 25 years.





Schedule D: Outline of Actuarial Assumptions & Methods

DEATHS AFTER RETIREMENT: Rates of mortality for the period after service retirement are according to the RP-2000 White Collar Mortality Table projected to 2020 using scale BB and adjusted 115% for all ages for males and 112% for ages 78 and over for females. The rates of disabled mortality were based on the RP-2000 Disabled Mortality Table projected to 2020 using scale BB and adjusted 105% for males and 120% for females. Representative values of assumed mortality are as follows:

Age	Service Retirement		Disability Retirement	
	Male	Female	Male	Female
55	0.3575%	0.2339%	3.5044%	1.7959%
60	0.5579	0.3825	3.8359	2.1434
65	0.9991	0.6795	4.1382	2.6417
70	1.6384	1.1928	4.8570	3.5474
75	2.8589	2.0200	6.3692	4.9231
80	5.0501	3.7900	8.4883	6.8160
85	8.8966	6.5271	10.9897	9.4450
90	16.4327	11.3249	15.4359	13.4706

SPOUSE'S BENEFIT: For those eligible for spouse's benefits, it is assumed that 75% will elect the lump sum death benefit payable from the death benefit fund and 25% will elect the spouse's benefit payable from the pension accumulation fund.

BENEFITS PAYABLE UPON SEPARATION FROM SERVICE: For active members who separate from service prior to eligibility for a service retirement allowance, the liability is assumed to be the greater of the value of the refund of contributions or the value of the deferred annuity.

UNUSED SICK LEAVE: 3% load on service retirement liabilities for active members. (No load for Tier II members)

PERCENTAGE MARRIED: 100% of active members are assumed to be married with the husband 3 years older than the wife.

VALUATION METHOD: Individual entry age normal cost method.

ASSET METHOD: Actuarial value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected 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.

LIABILITY FOR CURRENT INACTIVE MEMBERS: Member Contribution Balance is multiplied by a factor of 2.0 for vested members with incomplete data and 1.0 for other inactive members.

LIABILITY FOR POST-DROP ACTIVE MEMBERS: Members are assumed to retire immediately and receive their accrued benefit.

COLA: No future ad hoc cost of living adjustments (COLAs) are assumed.

FUTURE SERVICE CREDIT: One year of creditable service per year of employment.





Schedule E: Actuarial Cost Method

1. The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future (currently 7.70%), of each member's expected benefit payable at retirement or death is determined, based on his age, service, sex and compensation. The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the probability of his terminating with a service, disability or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries to obtain the present value of all expected benefits payable from the System on account of the present group of members and beneficiaries.
2. The employer contributions required to support the benefits of the System are determined following a level funding approach, and consist of a normal contribution and an actuarial accrued liability contribution.
3. The normal contribution is determined using the "individual entry age normal" method. Under this method, a calculation is made to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the each 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.
4. The unfunded actuarial accrued liability contributions are determined by subtracting the present value of prospective employer normal contributions and member contributions together with the current assets held from the present value of expected benefits to be paid from the System.





Schedule F: Board Funding Policy

FUNDING POLICY OF THE TEACHERS' RETIREMENT SYSTEM BOARD OF CONTROL EFFECTIVE 9/30/2019

The purpose of the funding policy is to state the overall funding objectives for the Teachers' Retirement System of Alabama (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 funding policy reflects the Board's long-term strategy for stability in funding of the plan. For that reason, it is critical that this funding policy remain unchanged until its objectives are met.

I. Funding Objectives

The goal 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 is expected to receive throughout retirement. In meeting this objective, the System will strive to meet the following funding objectives:

- To maintain an increasing funded ratio (ratio of system actuarial value of assets to actuarial accrued liabilities) that reflects a trend of improved actuarial condition. The long-term objective is to attain a funded ratio which is consistent with the fiscal health and long-term stability of the System.
 - To maintain adequate asset levels to finance the benefits promised to members and monitor the future demands for liquidity.
 - To develop a pattern of contribution rates expressed as a percentage of member payroll as measured by valuations prepared in accordance with applicable State laws and the principles of practice prescribed by the Actuarial Standards Board. In no event will the employer contribution rate be negative.
 - To provide intergenerational equity for taxpayers with respect to System costs.

II. Benchmarks

To track progress in achieving the previously outlined funding objectives, the following benchmarks will be measured annually as of the valuation date. The valuation date is the date that the annual actuarial valuation of the System's assets and liabilities is prepared. This date is currently September 30th each year 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 assets divided by the actuarial accrued liability, should increase over time, before adjustments for changes in benefits, actuarial methods, and/or actuarial assumptions. An open amortization period is one for which the amortization period is recalculated on a yearly basis and the ending date of the amortization period is a variable with each recalculation. A closed amortization period is one which is calculated over a fixed period and at the end of that period, the amount is fully amortized.





Schedule F: Board Funding Policy

- **Unfunded Actuarial Accrued Liability (UAAL)**
 - **Transitional UAAL** - The UAAL established as of the initial valuation date for which this funding policy is adopted shall be known as the Transitional UAAL (applicable only to employers participating in the System as of the adoption date of the funding policy).
 - **New Incremental UAAL** - Each subsequent valuation will produce a New Incremental UAAL consisting of all benefit changes, assumption and method changes and experience gains and/or losses that have occurred since the previous valuation.
- **UAAL Amortization Period and Contribution Rates**
 - In each valuation 1/15th of the Transitional UAAL will be amortized over a closed period. The closed period shall be the amortization period for the valuation preceding the adoption of the funding policy not to exceed 30 years. The remaining Transitional UAAL each year will be amortized over an open period. The open period shall be the amortization period for the valuation preceding the adoption of the funding policy not to exceed 30 years. After 15 years the entire Transitional UAAL will be closed.
 - Each New Incremental UAAL shall be amortized over a closed 30 year period.
 - Incremental UAAL resulting from plan changes that grant benefit improvements shall be amortized over a period not to exceed 15 years.
 - Employer Normal Contribution Rate – the contribution rate determined as of the valuation date each year based on the provisions of Alabama Code Section 16-25-21.
 - In each valuation subsequent to the adoption of this funding policy the required employer contribution rate will be determined by the summation of the employer Normal Contribution Rate, a contribution rate for administrative expenses, a contribution rate for the pre-retirement death benefit fund, a contribution rate for the term life insurance fund, the individual amortization rate for each of the New Incremental UAAL bases, the individual amortization rate for each of the 15 closed periods for the Transitional UAAL and the amortization of any remaining open portion of the Transitional UAAL.





Schedule F: Board Funding Policy

- **UAAL Amortization Period for Employers joining the System after the Implementation of this Funding Policy**
 - For Employers joining the System after the implementation of this Funding Policy, the employer contribution rate shall be computed as the sum of the employer Normal Contribution rate, a contribution rate for administrative expenses, a contribution rate for the pre-retirement death benefit fund, a contribution rate for the term life insurance fund, and the initial UAAL contribution rate. The initial UAAL contribution rate shall be determined by amortizing the initial UAAL over a closed period equal to the expected future working lifetime of the active membership. This initial amortization period shall not be less than 10 years nor greater than 30 years.
 - In subsequent years the UAAL and employer contribution rate shall be determined in accordance with the rules of the Funding Policy described in the previous section.

III. Methods and Assumptions

The actuarial funding method used to develop the benchmarks will be the Entry Age Normal (EAN) actuarial cost method. The actuarial methods and assumptions used will be those last adopted by the Board based upon the advice and recommendation of the actuary including the Interest Smoothing methodology. The actuary shall conduct an investigation into the system's experience at least every five years and utilize the results of the investigation to form the basis for those recommendations, which shall include the Interest Smoothing Methodology.

IV. Funding Policy Progress

The Board will periodically have projections of funded status performed to assess the current and expected future progress towards the overall funding goals of the System.





Schedule G: Amortization of Bases

PROJECTION OF THE OPEN TRANSITIONAL UAAL

Valuation Date	Transitional UAAL Beginning of Year (1)	Years (2)	Transitional Closed (3)= (1) / (2)	Transitional Remaining Open (4)=(1)-(3)	Interest (5)=(4) x ROR*	Amortization Payment (6)	Transitional Open UAAL End of Year (7)=(4)+(5)-(6)
9/30/2012	\$9,465,359,317	15	\$631,023,954	\$8,834,335,363	\$706,746,829	\$566,618,173	\$8,974,464,019
9/30/2013	8,974,464,019	14	641,033,144	8,333,430,875	666,674,470	534,491,072	8,465,614,273
9/30/2014	8,465,614,273	13	651,201,098	7,814,413,175	625,153,054	501,202,222	7,938,364,007
9/30/2015	7,938,364,007	12	661,530,334	7,276,833,673	582,146,694	466,722,853	7,392,257,515
9/30/2016	7,392,257,515	11	672,023,410	6,720,234,104	529,218,436	430,782,442	6,818,670,097
9/30/2017	6,818,670,097	10	681,867,010	6,136,803,088	475,602,239	393,163,056	6,219,242,271
9/30/2018	6,219,242,271	9	691,026,919	5,528,215,352	425,672,582	352,167,086	5,601,720,848
9/30/2019	5,601,720,848	8	700,215,106	4,901,505,742	377,415,942	312,243,443	4,966,678,241
9/30/2020	4,966,678,241	7	709,525,463	4,257,152,778	327,800,764	271,195,855	4,313,757,687
9/30/2021	4,313,757,687	6	718,959,615	3,594,798,072	276,799,452	229,001,492	3,642,596,032
9/30/2022	3,642,596,032	5	728,519,206	2,914,076,826	224,383,916	185,637,114	2,952,823,628
9/30/2023	2,952,823,628	4	738,205,907	2,214,617,721	170,525,565	141,079,068	2,244,064,218
9/30/2024	2,244,064,218	3	748,021,406	1,496,042,812	115,195,297	95,303,277	1,515,934,832
9/30/2025	1,515,934,832	2	757,967,416	757,967,416	58,363,491	48,285,235	768,045,672
9/30/2026	768,045,672	1	768,045,672	0	0	0	0

* The assumed rate of return (ROR) and the assumed rate of payroll growth are as follows:

2012-2015: 8.00%/3.25%
 2016: 7.875%/3.125%
 2017: 7.75%/3.00%
 2018 and later: 7.70%/3.00%





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASE CLOSED ON SEPTEMBER 30, 2012*

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2012</u>	<u>Annual Amortization Payment</u>
9/30/2012	\$631,023,954	\$40,472,727
9/30/2013	641,033,144	41,788,090
9/30/2014	650,527,705	43,146,203
9/30/2015	659,423,718	44,548,455
9/30/2016	667,629,161	45,967,602
9/30/2017	674,237,356	47,373,722
9/30/2018	679,117,029	48,560,159
9/30/2019	682,848,881	50,016,964
9/30/2020	685,411,281	51,517,473
9/30/2021	686,670,476	53,062,997
9/30/2022	686,481,106	54,654,887
9/30/2023	684,685,264	56,294,534
9/30/2024	681,111,496	57,983,370
9/30/2025	675,573,711	59,722,871
9/30/2026	667,870,016	61,514,557
9/30/2027	657,781,450	63,359,994
9/30/2028	645,070,629	65,260,793
9/30/2029	629,480,274	67,218,617
9/30/2030	610,731,637	69,235,176
9/30/2031	588,522,798	71,312,231
9/30/2032	562,526,822	73,451,598
9/30/2033	532,389,789	75,655,146
9/30/2034	497,728,657	77,924,800
9/30/2035	458,128,964	80,262,544
9/30/2036	413,142,350	82,670,421
9/30/2037	362,283,890	85,150,533
9/30/2038	305,029,216	87,705,049
9/30/2039	240,811,417	90,336,201
9/30/2040	169,017,695	93,046,287
9/30/2041	88,985,771	95,837,675
9/30/2042	0	0

*Reflects changes in interest rate and payroll growth assumptions as noted in the first exhibit in Schedule G





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2013*

Valuation Date	Balance of Transitional Closed 9/30/2013	Annual Amortization Payment	Balance of New Incremental UAAL 9/30/2013	Annual Amortization Payment
9/30/2013	\$641,033,144	\$41,114,698	\$420,529,361	\$26,971,987
9/30/2014	651,201,098	42,450,925	427,199,723	27,848,577
9/30/2015	660,846,260	43,830,581	433,527,124	28,753,655
9/30/2016	669,883,380	45,227,607	439,455,639	29,670,130
9/30/2017	677,409,090	46,611,879	444,392,641	30,578,238
9/30/2018	683,296,415	47,772,054	448,254,833	31,339,333
9/30/2019	688,138,185	49,205,216	451,431,122	32,279,513
9/30/2020	691,919,610	50,681,372	453,911,805	33,247,899
9/30/2021	694,516,048	52,201,813	455,615,115	34,245,336
9/30/2022	695,791,970	53,767,868	456,452,143	35,272,696
9/30/2023	695,600,084	55,380,904	456,326,263	36,330,877
9/30/2024	693,780,387	57,042,331	455,132,508	37,420,803
9/30/2025	690,159,146	58,753,601	452,756,908	38,543,427
9/30/2026	684,547,799	60,516,209	449,075,763	39,699,730
9/30/2027	676,741,771	62,331,695	443,954,867	40,890,722
9/30/2028	666,519,192	64,201,646	437,248,670	42,117,443
9/30/2029	653,639,524	66,127,695	428,799,375	43,380,967
9/30/2030	637,842,072	68,111,526	418,435,960	44,682,396
9/30/2031	618,844,386	70,154,872	405,973,133	46,022,868
9/30/2032	596,340,531	72,259,518	391,210,197	47,403,554
9/30/2033	569,999,234	74,427,304	373,929,829	48,825,660
9/30/2034	539,461,872	76,660,123	353,896,765	50,290,430
9/30/2035	504,340,313	78,959,926	330,856,386	51,799,143
9/30/2036	464,214,591	81,328,724	304,533,185	53,353,117
9/30/2037	418,630,390	83,768,586	274,629,123	54,953,711
9/30/2038	367,096,344	86,281,643	240,821,855	56,602,322
9/30/2039	309,081,119	88,870,093	202,762,816	58,300,392
9/30/2040	244,010,272	91,536,196	160,075,161	60,049,403
9/30/2041	171,262,868	94,282,281	112,351,545	61,850,885
9/30/2042	90,167,827	97,110,750	59,151,729	63,706,412
9/30/2043	0	0	0	0

*Reflects changes in interest rate and payroll growth assumptions as noted in the first exhibit in Schedule G





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2014*

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2014</u>	<u>Annual Amortization Payment</u>	<u>Balance of New Incremental UAAL 9/30/2014</u>	<u>Annual Amortization Payment</u>
9/30/2014	\$651,201,098	\$41,766,852	\$(166,584,327)	\$(10,684,415)
9/30/2015	661,530,334	43,124,275	(169,226,658)	(11,031,659)
9/30/2016	671,328,486	44,499,509	(171,733,132)	(11,383,459)
9/30/2017	679,696,096	45,862,256	(173,873,657)	(11,732,064)
9/30/2018	686,510,287	46,996,851	(175,616,802)	(12,022,306)
9/30/2019	692,374,728	48,406,756	(177,116,990)	(12,382,975)
9/30/2020	697,280,826	49,858,959	(178,372,023)	(12,754,464)
9/30/2021	701,112,491	51,354,728	(179,352,204)	(13,137,098)
9/30/2022	703,743,425	52,895,369	(180,025,226)	(13,531,211)
9/30/2023	705,036,300	54,482,230	(180,355,957)	(13,937,147)
9/30/2024	704,841,864	56,116,697	(180,306,219)	(14,355,262)
9/30/2025	702,997,990	57,800,198	(179,834,536)	(14,785,920)
9/30/2026	699,328,637	59,534,204	(178,895,875)	(15,229,497)
9/30/2027	693,642,738	61,320,230	(177,441,360)	(15,686,382)
9/30/2028	685,732,999	63,159,837	(175,417,963)	(16,156,974)
9/30/2029	675,374,602	65,054,632	(172,768,172)	(16,641,683)
9/30/2030	662,323,814	67,006,271	(169,429,639)	(17,140,933)
9/30/2031	646,316,476	69,016,460	(165,334,788)	(17,655,161)
9/30/2032	627,066,386	71,086,953	(160,410,405)	(18,184,816)
9/30/2033	604,263,544	73,219,562	(154,577,190)	(18,730,361)
9/30/2034	577,572,275	75,416,149	(147,749,273)	(19,292,272)
9/30/2035	546,629,191	77,678,633	(139,833,695)	(19,871,040)
9/30/2036	511,041,006	80,008,992	(130,729,850)	(20,467,171)
9/30/2037	470,382,171	82,409,262	(120,328,878)	(21,081,186)
9/30/2038	424,192,336	84,881,540	(108,513,015)	(21,713,622)
9/30/2039	371,973,606	87,427,986	(95,154,896)	(22,365,030)
9/30/2040	313,187,588	90,050,826	(80,116,793)	(23,035,981)
9/30/2041	247,252,206	92,752,350	(63,249,805)	(23,727,061)
9/30/2042	173,538,276	95,534,921	(44,392,979)	(24,438,872)
9/30/2043	91,365,802	98,400,969	(23,372,366)	(25,172,039)
9/30/2044	0	0	0	0

*Reflects changes in interest rate and payroll growth assumptions as noted in the first exhibit in Schedule G





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2015*

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2015</u>	<u>Annual Amortization Payment</u>	<u>Balance of New Incremental UAAL 9/30/2015</u>	<u>Annual Amortization Payment</u>
9/30/2015	\$661,530,334	\$42,429,350	\$(79,902,094)	\$(5,124,775)
9/30/2016	672,023,410	43,783,117	(81,169,487)	(5,288,288)
9/30/2017	681,162,137	45,124,658	(82,273,296)	(5,450,324)
9/30/2018	688,827,545	46,234,335	(83,199,153)	(5,584,355)
9/30/2019	695,632,931	47,621,365	(84,021,132)	(5,751,886)
9/30/2020	701,575,301	49,050,006	(84,738,874)	(5,924,442)
9/30/2021	706,546,594	50,521,506	(85,339,325)	(6,102,175)
9/30/2022	710,429,175	52,037,151	(85,808,278)	(6,285,241)
9/30/2023	713,095,071	53,598,266	(86,130,275)	(6,473,798)
9/30/2024	714,405,125	55,206,214	(86,288,508)	(6,668,012)
9/30/2025	714,208,106	56,862,400	(86,264,711)	(6,868,052)
9/30/2026	712,339,730	58,568,272	(86,039,042)	(7,074,094)
9/30/2027	708,621,617	60,325,320	(85,589,954)	(7,286,317)
9/30/2028	702,860,161	62,135,080	(84,894,064)	(7,504,906)
9/30/2029	694,845,313	63,999,132	(83,926,001)	(7,730,053)
9/30/2030	684,349,270	65,919,106	(82,658,250)	(7,961,955)
9/30/2031	671,125,058	67,896,680	(81,060,980)	(8,200,813)
9/30/2032	654,905,008	69,933,580	(79,101,862)	(8,446,838)
9/30/2033	635,399,113	72,031,587	(76,745,868)	(8,700,243)
9/30/2034	612,293,258	74,192,535	(73,955,057)	(8,961,250)
9/30/2035	585,247,304	76,418,311	(70,688,346)	(9,230,088)
9/30/2036	553,893,035	78,710,860	(66,901,261)	(9,506,990)
9/30/2037	517,831,938	81,072,186	(62,545,667)	(9,792,200)
9/30/2038	476,632,811	83,504,352	(57,569,484)	(10,085,966)
9/30/2039	429,829,186	86,009,482	(51,916,368)	(10,388,545)
9/30/2040	376,916,551	88,589,767	(45,525,383)	(10,700,201)
9/30/2041	317,349,359	91,247,460	(38,330,636)	(11,021,208)
9/30/2042	250,537,800	93,984,884	(30,260,887)	(11,351,844)
9/30/2043	175,844,327	96,804,430	(21,239,132)	(11,692,399)
9/30/2044	92,579,910	99,708,563	(11,182,146)	(12,043,171)
9/30/2045	0	0	0	0

*Reflects changes in interest rate and payroll growth assumptions as noted in the first exhibit in Schedule G





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2016*

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2016</u>	<u>Annual Amortization Payment</u>	<u>Balance of New Incremental UAAL 9/30/2016</u>	<u>Annual Amortization Payment</u>
9/30/2016	\$672,023,410	\$43,078,244	\$238,646,903	\$15,297,815
9/30/2017	681,867,009	44,398,892	242,142,532	15,766,799
9/30/2018	690,312,811	45,484,296	245,141,779	16,152,245
9/30/2019	697,982,601	46,848,825	247,865,452	16,636,812
9/30/2020	704,878,436	48,254,290	250,314,279	17,135,916
9/30/2021	710,899,785	49,701,919	252,452,563	17,649,994
9/30/2022	715,937,150	51,192,976	254,241,416	18,179,494
9/30/2023	719,871,334	52,728,766	255,638,512	18,724,878
9/30/2024	722,572,661	54,310,629	256,597,799	19,286,625
9/30/2025	723,900,127	55,939,947	257,069,205	19,865,223
9/30/2026	723,700,490	57,618,146	256,998,310	20,461,180
9/30/2027	721,807,281	59,346,690	256,325,999	21,075,016
9/30/2028	718,039,752	61,127,091	254,988,086	21,707,266
9/30/2029	712,201,722	62,960,904	252,914,902	22,358,484
9/30/2030	704,080,350	64,849,731	250,030,866	23,029,239
9/30/2031	693,444,807	66,795,223	246,254,004	23,720,116
9/30/2032	680,044,834	68,799,079	241,495,447	24,431,719
9/30/2033	663,609,207	70,863,052	235,658,877	25,164,671
9/30/2034	643,844,064	72,988,943	228,639,940	25,919,611
9/30/2035	620,431,113	75,178,612	220,325,604	26,697,199
9/30/2036	593,025,697	77,433,970	210,593,476	27,498,115
9/30/2037	561,254,706	79,756,989	199,311,059	28,323,059
9/30/2038	524,714,329	82,149,699	186,334,952	29,172,750
9/30/2039	482,967,634	84,614,190	171,509,993	30,047,933
9/30/2040	435,541,952	87,152,615	154,668,329	30,949,371
9/30/2041	381,926,067	89,767,194	135,628,419	31,877,852
9/30/2042	321,567,180	92,460,210	114,193,956	32,834,188
9/30/2043	253,867,643	95,234,016	90,152,703	33,819,213
9/30/2044	178,181,435	98,091,037	63,275,248	34,833,790
9/30/2045	93,810,369	101,033,768	33,313,652	35,878,803
9/30/2046	0	0	0	0

*Reflects change in interest rate and payroll growth assumption as noted in the first exhibit in Schedule G





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2017*

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2017</u>	<u>Annual Amortization Payment</u>	<u>Balance of New Incremental UAAL 9/30/2017</u>	<u>Annual Amortization Payment</u>
9/30/2017	\$681,867,010	\$43,684,784	\$157,571,306	\$10,095,031
9/30/2018	691,026,919	44,746,543	159,688,051	10,340,391
9/30/2019	699,489,449	46,088,940	161,643,641	10,650,602
9/30/2020	707,261,197	47,471,608	163,439,599	10,970,120
9/30/2021	714,248,701	48,895,756	165,054,327	11,299,224
9/30/2022	720,350,095	50,362,629	166,464,286	11,638,201
9/30/2023	725,454,424	51,873,508	167,643,836	11,987,347
9/30/2024	729,440,907	53,429,713	168,565,064	12,346,967
9/30/2025	732,178,144	55,032,604	169,197,607	12,717,376
9/30/2026	733,523,256	56,683,582	169,508,446	13,098,898
9/30/2027	733,320,965	58,384,090	169,461,699	13,491,864
9/30/2028	731,402,589	60,135,612	169,018,386	13,896,620
9/30/2029	727,584,976	61,939,681	168,136,181	14,313,519
9/30/2030	721,669,339	63,797,871	166,769,148	14,742,925
9/30/2031	713,440,006	65,711,807	164,867,448	15,185,212
9/30/2032	702,663,080	67,683,162	162,377,029	15,640,769
9/30/2033	689,084,975	69,713,656	159,239,291	16,109,992
9/30/2034	672,430,862	71,805,066	155,390,725	16,593,291
9/30/2035	652,402,972	73,959,218	150,762,519	17,091,090
9/30/2036	628,678,782	76,177,995	145,280,143	17,603,823
9/30/2037	600,909,054	78,463,335	138,862,891	18,131,938
9/30/2038	568,715,717	80,817,235	131,423,396	18,675,896
9/30/2039	531,689,592	83,241,752	122,867,102	19,236,173
9/30/2040	489,387,939	85,739,004	113,091,696	19,813,258
9/30/2041	441,331,806	88,311,174	101,986,499	20,407,656
9/30/2042	387,003,181	90,960,510	89,431,804	21,019,885
9/30/2043	325,841,916	93,689,325	75,298,168	21,650,482
9/30/2044	257,242,419	96,500,005	59,445,645	22,299,996
9/30/2045	180,550,081	99,395,005	41,722,963	22,968,996
9/30/2046	95,057,433	102,376,855	21,966,635	23,658,066
9/30/2047	0	0	0	0

*Reflects change in interest rate and payroll growth assumption beginning as noted in the first exhibit in Schedule G





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2018

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2018</u>	<u>Annual Amortization Payment</u>	<u>Balance of New Incremental UAAL 9/30/2018</u>	<u>Annual Amortization Payment</u>
9/30/2018	\$691,026,919	\$44,020,886	\$(310,622,662)	\$(19,787,774)
9/30/2019	700,215,106	45,341,512	(314,752,833)	(20,381,408)
9/30/2020	708,790,157	46,701,758	(318,607,393)	(20,992,850)
9/30/2021	716,665,241	48,102,810	(322,147,313)	(21,622,635)
9/30/2022	723,745,654	49,545,895	(325,330,021)	(22,271,314)
9/30/2023	729,928,175	51,032,272	(328,109,118)	(22,939,454)
9/30/2024	735,100,373	52,563,240	(330,434,066)	(23,627,637)
9/30/2025	739,139,862	54,140,137	(332,249,852)	(24,336,466)
9/30/2026	741,913,494	55,764,341	(333,496,624)	(25,066,560)
9/30/2027	743,276,493	57,437,271	(334,109,304)	(25,818,557)
9/30/2028	743,071,511	59,160,389	(334,017,163)	(26,593,114)
9/30/2029	741,127,628	60,935,201	(333,143,370)	(27,390,907)
9/30/2030	737,259,255	62,763,257	(331,404,502)	(28,212,635)
9/30/2031	731,264,960	64,646,155	(328,710,014)	(29,059,014)
9/30/2032	722,926,207	66,585,539	(324,961,672)	(29,930,784)
9/30/2033	712,005,986	68,583,106	(320,052,936)	(30,828,708)
9/30/2034	698,247,341	70,640,599	(313,868,305)	(31,753,569)
9/30/2035	681,371,787	72,759,817	(306,282,596)	(32,706,176)
9/30/2036	661,077,598	74,942,611	(297,160,180)	(33,687,361)
9/30/2037	637,037,962	77,190,890	(286,354,152)	(34,697,982)
9/30/2038	608,898,995	79,506,616	(273,705,440)	(35,738,921)
9/30/2039	576,277,602	81,891,815	(259,041,837)	(36,811,089)
9/30/2040	538,759,162	84,348,569	(242,176,970)	(37,915,422)
9/30/2041	495,895,049	86,879,026	(222,909,174)	(39,052,884)
9/30/2042	447,199,941	89,485,397	(201,020,296)	(40,224,471)
9/30/2043	392,148,939	92,169,959	(176,274,388)	(41,431,205)
9/30/2044	330,174,449	94,935,058	(148,416,311)	(42,674,141)
9/30/2045	260,662,823	97,783,110	(117,170,226)	(43,954,366)
9/30/2046	182,950,751	100,716,603	(82,237,968)	(45,272,996)
9/30/2047	96,321,356	103,738,101	(43,297,295)	(46,631,186)
9/30/2048	0	0	0	0





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2019

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2019</u>	<u>Annual Amortization Payment</u>	<u>Balance of New Incremental UAAL 9/30/2019</u>	<u>Annual Amortization Payment</u>
9/30/2019	\$700,215,106	\$44,606,206	\$650,691,688	\$41,451,387
9/30/2020	709,525,463	45,944,392	659,343,561	42,694,929
9/30/2021	718,214,531	47,322,724	667,418,086	43,975,777
9/30/2022	726,194,326	48,742,406	674,833,502	45,295,050
9/30/2023	733,368,884	50,204,678	681,500,631	46,653,902
9/30/2024	739,633,610	51,710,818	687,322,278	48,053,519
9/30/2025	744,874,579	53,262,143	692,192,575	49,495,124
9/30/2026	748,967,779	54,860,007	695,996,279	50,979,978
9/30/2027	751,778,291	56,505,807	698,608,015	52,509,377
9/30/2028	753,159,412	58,200,982	699,891,455	54,084,659
9/30/2029	752,951,705	59,947,011	699,698,438	55,707,198
9/30/2030	750,981,975	61,745,421	697,868,020	57,378,414
9/30/2031	747,062,166	63,597,784	694,225,443	59,099,767
9/30/2032	740,988,169	65,505,718	688,581,035	60,872,760
9/30/2033	732,538,541	67,470,889	680,729,015	62,698,943
9/30/2034	721,473,119	69,495,016	670,446,207	64,579,911
9/30/2035	707,531,534	71,579,866	657,490,654	66,517,308
9/30/2036	690,431,596	73,727,262	641,600,126	68,512,827
9/30/2037	669,867,566	75,939,080	622,490,509	70,568,212
9/30/2038	645,508,289	78,217,252	599,854,066	72,685,259
9/30/2039	616,995,175	80,563,770	573,357,570	74,865,816
9/30/2040	583,940,033	82,980,683	542,640,287	77,111,791
9/30/2041	545,922,733	85,470,104	507,311,798	79,425,144
9/30/2042	502,488,679	88,034,207	466,949,662	81,807,899
9/30/2043	453,146,101	90,675,233	421,096,887	84,262,136
9/30/2044	397,363,118	93,395,490	369,259,212	86,790,000
9/30/2045	334,564,588	96,197,355	310,902,171	89,393,700
9/30/2046	264,128,707	99,083,275	245,447,938	92,075,511
9/30/2047	185,383,342	102,055,773	172,271,919	94,837,776
9/30/2048	97,602,086	105,117,447	90,699,080	97,682,909
9/30/2049	0	0	0	0





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR BASES CLOSED ON SEPTEMBER 30, 2020

<u>Valuation Date</u>	<u>Balance of Transitional Closed 9/30/2020</u>	<u>Annual Amortization Payment</u>	<u>Balance of New Incremental UAAL 9/30/2020</u>	<u>Annual Amortization Payment</u>
9/30/2020	\$709,525,463	\$45,199,309	\$(447,045,065)	\$(28,478,369)
9/30/2021	718,959,615	46,555,288	(452,989,166)	(29,332,720)
9/30/2022	727,764,216	47,951,947	(458,536,611)	(30,212,702)
9/30/2023	735,850,114	49,390,505	(463,631,228)	(31,119,083)
9/30/2024	743,120,067	50,872,221	(468,211,750)	(32,052,655)
9/30/2025	749,468,092	52,398,387	(472,211,399)	(33,014,235)
9/30/2026	754,778,748	53,970,339	(475,557,442)	(34,004,662)
9/30/2027	758,926,372	55,589,449	(478,170,703)	(35,024,802)
9/30/2028	761,774,254	57,257,133	(479,965,045)	(36,075,546)
9/30/2029	763,173,739	58,974,846	(480,846,808)	(37,157,812)
9/30/2030	762,963,270	60,744,092	(480,714,199)	(38,272,547)
9/30/2031	760,967,350	62,566,415	(479,456,646)	(39,420,723)
9/30/2032	756,995,422	64,443,407	(476,954,084)	(40,603,345)
9/30/2033	750,840,662	66,376,709	(473,076,204)	(41,821,445)
9/30/2034	742,278,684	68,368,011	(467,681,626)	(43,076,089)
9/30/2035	731,066,132	70,419,051	(460,617,023)	(44,368,371)
9/30/2036	716,939,173	72,531,622	(451,716,162)	(45,699,422)
9/30/2037	699,611,867	74,707,571	(440,798,884)	(47,070,405)
9/30/2038	678,774,410	76,948,798	(427,669,993)	(48,482,517)
9/30/2039	654,091,241	79,257,262	(412,118,066)	(49,936,993)
9/30/2040	625,199,004	81,634,980	(393,914,164)	(51,435,103)
9/30/2041	591,704,348	84,084,029	(372,810,452)	(52,978,156)
9/30/2042	553,181,553	86,606,550	(348,538,701)	(54,567,500)
9/30/2043	509,169,982	89,204,747	(320,808,681)	(56,204,525)
9/30/2044	459,171,324	91,880,889	(289,306,424)	(57,890,661)
9/30/2045	402,646,627	94,637,316	(253,692,357)	(59,627,381)
9/30/2046	339,013,101	97,476,435	(213,599,288)	(61,416,202)
9/30/2047	267,640,674	100,400,728	(168,630,231)	(63,258,688)
9/30/2048	187,848,278	103,412,750	(118,356,070)	(65,156,449)
9/30/2049	98,899,845	106,515,133	(62,313,039)	(67,111,143)
9/30/2050	0	0	0	0





Schedule G: Amortization of Bases

AMORTIZATION SCHEDULE FOR TOTAL UAAL AS OF SEPTEMBER 30, 2020

<u>Year</u>	<u>Projected UAAL</u>	<u>Payment for year Beginning September 30,</u>
2020	\$11,071,566,401	\$741,773,761
2021	11,182,303,252	759,497,033
2022	11,283,843,570	778,456,800
2023	11,374,242,724	798,709,701
2024	11,451,349,713	820,314,467
2025	11,512,789,175	843,331,995
2026	11,555,941,946	867,825,419
2027	11,577,924,056	893,860,182
2028	11,575,564,027	920,675,987
2029	11,546,206,470	948,296,267
2030	11,486,968,102	976,745,155
2031	11,394,719,491	1,006,047,509
2032	11,266,065,382	1,036,228,935
2033	11,097,323,482	1,067,315,803
2034	10,884,501,588	1,099,335,277
2035	10,623,272,933	1,132,315,335
2036	10,308,949,614	1,166,284,795
2037	9,936,453,939	1,201,273,339
2038	9,500,287,554	1,237,311,539
2039	8,994,498,156	1,274,430,885
2040	8,412,643,629	1,312,663,812
2041	7,747,753,377	1,352,043,726
2042	6,992,286,661	1,293,892,232
2043	6,236,800,501	1,167,067,323
2044	5,549,966,817	1,126,653,544
2045	4,850,660,718	1,070,157,797
2046	4,154,003,796	961,242,583
2047	3,512,619,506	860,263,892
2048	2,922,827,316	827,251,687
2049	2,320,633,332	643,184,870
2050	1,856,137,228	621,894,307
2051	1,377,165,489	529,381,790
2052	953,825,441	432,615,744
2053	594,654,256	331,448,907
2054	308,993,726	225,729,341
2055	107,056,902	115,300,283
2056	0	0





Schedule H: Summary of Main Plan Provisions

AS INTERPRETED FOR VALUATION PURPOSES

The Teachers' Retirement System of Alabama was established on September 15, 1939 and went into effect September 30, 1941. The valuation took into account amendments to the System through the valuation date. There is a new tier (Tier II) of benefits for all members initially joining the System on and after January 1, 2013. The following summary describes the main benefit and contribution provisions of the System as interpreted for the valuation.

1 - DEFINITIONS

Average Final Compensation - the average compensation of a member for:

Tier I – the 3 highest years in the last 10 years of Creditable Service

Tier II – the 5 highest years in the last 10 years of Creditable Service

Membership Service – all service rendered while a member of the retirement system and for which contributions are made.

Creditable Service – the sum of membership service, prior service, and any other service established as creditable in accordance with the provisions of the retirement law.

Annuity – payments for life derived from accumulated contributions of a member.

Pension – payments for life derived from employer contributions.

Retirement Allowance – the sum of the annuity and pension.

2 - BENEFITS

Service Retirement Allowance

Condition for Allowance

Tier I

A retirement allowance is payable upon the request of any member who has completed 25 years of creditable service or who has attained age 60 and completed at least 10 years of creditable service.

Tier II

A retirement allowance is payable upon the request of any member who has attained age 62 and completed at least 10 years of creditable service (age 56 with 10 years of creditable service for a full-time certified firefighter, police officer or correctional officer).





Schedule H: Summary of Main Plan Provisions

Amount of Allowance

Tier I	Upon service retirement a member receives a retirement allowance equal to 2.0125% of the member's average final compensation multiplied by the number of years of creditable service. At retirement, a member receives one additional year of creditable service in determining the retirement allowance for each five years of service as a full-time certified firefighter, police officer or correctional officer.
Tier II	Upon service retirement a member receives a retirement allowance equal to 1.65% of the member's average final compensation multiplied by the number of years of creditable service. The benefit is capped at 80% of the member's average final compensation.
Both	The member may elect to receive a reduced retirement allowance in order to provide an allowance to a designated beneficiary after the member's death (see "Special Privileges at Retirement" below).

Disability Retirement Allowance

Condition for Allowance	A disability retirement allowance may be granted to a member who has 10 years or more of creditable service who becomes totally and permanently incapacitated for duty before reaching eligibility for a service retirement allowance.
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Amount of Allowance

Tier I	On retirement for disability, a member receives a retirement allowance equal to 2.0125% of the member's average final compensation multiplied by the number of years of creditable service. At retirement, a member receives one additional year of creditable service in determining the retirement allowance for each five years of service as a full-time certified firefighter, police officer or correctional officer.
Tier II	Upon disability retirement a member receives a retirement allowance equal to 1.65% of the member's average final compensation multiplied by the number of years of creditable service. The benefit is capped at 80% of the member's average final compensation.
Both	The member may elect to receive a reduced retirement allowance in order to provide an allowance to a designated beneficiary after the member's death (see "Special Privileges at Retirement" below).





Schedule H: Summary of Main Plan Provisions

Benefits Payable on
Separation from Service

Any member who withdraws from service is entitled to receive his or her contributions with allowable interest. A member who has completed 10 years of creditable service may, after separation from service, continue in the membership of the System and file for service retirement after reaching age 60 (age 62 for Tier II members).

Benefits Payable upon
Death in Active Service

In the event of the death of a member eligible for service retirement, the designated beneficiary may elect (1) to exercise Option 3 defined below under "Special Privileges at Retirement" or (2) to receive a return of member contributions and total earned interest plus a death benefit payable from the pre-retirement death benefit fund equal to the salary on which the member made retirement contributions for the previous scholastic year (July 1-June 30).*

In the event of the death of a member with more than one year of service who is not eligible to retire, the designated beneficiary shall receive the return of member contributions and total earned interest. Also, the designated beneficiary shall receive an additional death benefit payable from the pre-retirement death benefit fund equal to the salary on which retirement contributions were made for the previous scholastic year (July 1-June 30).*

In the event of a job-related death of a member with less than one year of service, the designated beneficiary shall receive the return of member contributions and total earned interest plus a death benefit payable from the pre-retirement death benefit fund equal to the annual earnable compensation of the member at the time of death.*

In the event of the death of a member with less than one year of service that is not job-related, the designated beneficiary shall receive the return of member contributions and total earned interest plus a matching death benefit which is limited to a \$5,000 maximum.

*However, if the death occurred more than 180 calendar days after the member's last day in pay status, or if the deceased had applied for a refund of contributions or terminated employment, the lump sum will be the same as if the member had less than one year of service and the death was not job-related.





Schedule H: Summary of Main Plan Provisions

Special Privileges at Retirement

In lieu of the full retirement allowance, any member may, at retirement, elect to receive a reduced retirement allowance equal in value to the full allowance, with the provision that:

Option 1 - If the member dies before annuity payments have equaled the present value of the annuity at the date of retirement, the balance is paid to a designated beneficiary or to his estate, or

Option 2 - After the member's death, the member's allowance is continued throughout the life of the designated beneficiary, or

Option 3 - After the member's death, one-half of the member's allowance is continued throughout the life of the designated beneficiary, or

Option 4 - Some other benefit is paid either to the member or to such other person as the member shall designate provided such benefit, together with the reduced retirement allowance, is of equivalent actuarial value to his retirement allowance and is approved by the Board of Control.

Deferred Retirement Option Plan (DROP)

Prior to March 25, 2011, a member may elect to participate in the Deferred Retirement Option Plan (DROP) upon completion of at least 25 years of creditable service (excluding sick leave) and attainment of at least 55 years of age. Under the DROP, the member may defer receipt of a retirement allowance and continue employment for a period not to exceed five years, nor to be less than three years. At the end of this period, the member will withdraw from active service and receive the retirement benefit calculated at the time of enrollment in the DROP, and also receive a payment for the deferred retirement benefits, employee contributions while participating in the DROP and interest earned on DROP deposits.

The effect of Act 2011-27 is that no new participants will be allowed to enter DROP with an effective participation date after June 1, 2011.

Term Life Insurance

Upon the death of a contributing member there is paid a term life insurance benefit of \$15,000 (pro-rated for part-time members)





Schedule H: Summary of Main Plan Provisions

Member Contributions

Tier I	<p>Prior to October 1, 2011, regular members contributed 5.0% of salary and certified police officers, firefighters and correctional officers contributed 6.0% of salary. DROP participants continue to contribute during the DROP period, but receive a refund of these contributions and regular interest upon retirement.</p> <p>Beginning October 1, 2011, the contribution rates were increased to 7.25% for regular members and 8.25% for police officers, firefighters and correctional officers.</p> <p>Beginning October 1, 2012, the contribution rates were increased to 7.50% for regular members and 8.50% for police officers, firefighters and correctional officers.</p>
Tier II	<p>Regular members contribute 6% of salary and full-time certified firefighters, police officers and correctional officers contribute 7% of salary</p>
Both	<p>If positive investment performance results in a decrease in the total contribution rate paid by employers and employees participating in the System, the Retirement System of Alabama shall first reduce the employee contribution rate.</p> <p>“Regular Interest” is 4% which is the rate adopted by the Board and applied to the balance in each member’s account every year; however, if a member receives a refund of contributions, the interest rate applied to the refund is lower than the 4% regular rate (Based on Section 16-25-14-(g)(1)).</p>





Schedule I: Schedule of Membership Data

AS OF SEPTEMBER 30, 2020
NUMBER OF ACTIVE MEMBERS AND THEIR AVERAGE COMPENSATION
BY AGE AND YEARS OF SERVICE

Attained Age	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 to 39	≥ 40		
Under 25	1,176	1,535	7									2,718
Avg. Pay	41,371	35,095	33,343									37,806
25 to 29	1,139	7,020	1,527	2								9,688
Avg. Pay	41,701	39,940	46,952	28,243								41,250
30 to 34	847	5,197	6,271	1,172	9							13,496
Avg. Pay	43,451	43,695	50,563	56,385	34,733							47,967
35 to 39	710	4,624	4,089	4,884	1,710	13						16,030
Avg. Pay	44,586	45,676	53,570	58,351	60,152	67,172						53,065
40 to 44	581	4,035	3,627	3,326	5,363	1,403	11					18,346
Avg. Pay	40,170	43,459	53,838	59,513	62,822	65,612	61,805					55,683
45 to 49	491	3,309	3,243	2,984	3,496	5,060	836	6				19,425
Avg. Pay	41,281	43,679	50,493	58,444	62,192	66,777	68,892	41,407				57,457
50 to 54	432	2,769	2,819	2,843	3,246	3,668	2,736	490	10			19,013
Avg. Pay	40,090	43,072	46,966	55,449	56,872	63,629	71,008	71,829	63,655			56,526
55 to 59	310	2,165	2,198	2,337	2,964	3,203	1,645	1,114	212	3		16,151
Avg. Pay	39,165	40,248	45,041	51,028	52,710	57,228	65,000	70,205	63,490	62,587		52,990
60 to 64	196	1,349	1,606	1,577	1,947	2,073	1,270	815	421	144		11,398
Avg. Pay	32,576	39,478	43,718	53,246	49,857	54,075	64,434	70,223	75,296	67,278		52,943
65 to 69	74	616	978	634	681	623	414	286	52	29		4,387
Avg. Pay	24,300	35,249	56,221	51,764	51,978	54,851	63,098	80,021	92,827	69,681		53,964
70 & up	30	261	498	404	311	224	150	120	26	31		2,055
Avg. Pay	22,362	34,464	50,138	56,177	48,143	58,280	65,107	80,967	90,776	105,613		53,759
Total	5,986	32,880	26,863	20,163	19,727	16,267	7,062	2,831	721	207		132,707
Avg. Pay	41,185	42,056	50,204	56,531	58,082	61,894	67,573	71,878	73,486	73,288		52,893

Average Age: 45.90

Average Service: 11.33





Schedule I: Schedule of Membership Data

NUMBER OF SERVICE RETIREMENTS AND THEIR BENEFITS BY AGE

Age	Number of Members	Total Annual Benefits	Average Annual Benefits
Under 50	264	\$ 8,531,165	\$ 32,315
50 – 54	2,239	73,659,677	32,898
55 – 59	4,381	143,640,925	32,787
60 – 64	11,997	332,268,693	27,696
65 – 69	20,697	513,882,333	24,829
70 – 74	21,073	495,373,987	23,508
75 – 79	13,233	300,327,814	22,695
80 – 84	8,247	180,007,372	21,827
85 – 89	4,515	92,769,957	20,547
90 – 94	1,988	37,248,391	18,737
95 & Over	562	9,638,828	17,151
Total	89,196	\$ 2,187,349,142	\$ 24,523

Average Age: 71.2

NUMBER OF BENEFICIARIES AND THEIR BENEFITS BY AGE

Age	Number of Members	Total Annual Benefits	Average Annual Benefits
Under 50	408	\$ 4,891,650	\$ 11,989
50 – 54	217	2,433,078	11,212
55 – 59	280	3,539,916	12,643
60 – 64	473	7,082,471	14,974
65 – 69	709	11,317,897	15,963
70 – 74	898	15,635,179	17,411
75 – 79	896	16,065,572	17,930
80 – 84	804	14,711,772	18,298
85 – 89	592	9,832,932	16,610
90 – 94	318	4,966,825	15,619
95 & Over	117	1,756,944	15,017
Total	5,712	\$ 92,234,236	\$ 16,147

Average Age: 72.2





Schedule I: Schedule of Membership Data

NUMBER OF DISABLED RETIREES AND THEIR BENEFITS BY AGE

Age	Number of Members	Total Annual Benefits	Average Annual Benefits
Under 50	292	\$ 3,985,074	\$ 13,648
50 – 54	483	6,662,661	13,794
55 – 59	867	10,551,626	12,170
60 – 64	1,262	15,687,770	12,431
65 – 69	1,298	14,791,628	11,396
70 – 74	933	10,326,920	11,069
75 – 79	509	5,659,026	11,118
80 – 84	212	2,368,424	11,172
85 – 89	71	758,586	10,684
90 – 94	26	266,735	10,259
95 & Over	5	75,404	15,081
Total	5,958	\$ 71,133,854	\$ 11,939

Average Age: 64.8

