Arkansas Teacher Retirement System

Annual Actuarial Valuation of
Active and Inactive Members
June 30, 2020

Report of the June 30, 2020 Actuarial Valuation

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November 24, 2020

Board of Trustees
Arkansas Teacher Retirement System
Little Rock, Arkansas

Dear Board Members:

Presented in this report are the results of the ***Annual Actuarial Valuation of non-retired members as of June 30, 2020.*** The June 30th annual valuation of retired lives receiving monthly benefits indicates the liabilities for future benefit payments to existing retirees. These liabilities are covered in detail in a separate report. They are also covered briefly in this report on page B-4.

The purposes of the valuation are to measure the System's funding progress and to determine the amortization period that results from the statutory employer and employee rates and the actuarial assumptions that the Board has adopted. This report should not be relied on for any purpose other than the purposes described herein. Financial results associated with the benefits described in this report that are developed for purposes other than those identified above may be significantly different than those in this report.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the Retirement System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

This valuation was based upon census data and financial information provided by the System's administrative staff. Preparation of this data requires considerable staff time. The helpful cooperation of the Arkansas Teacher Retirement System (ATRS) staff in furnishing the data is acknowledged with appreciation. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of any data provided by ATRS.

This report was prepared using certain assumptions approved by the Board. The actuarial assumptions used for valuation purposes are summarized in Section G. These assumptions reflect experience during the period July 1, 2010 to June 30, 2015 and expectations for the future.

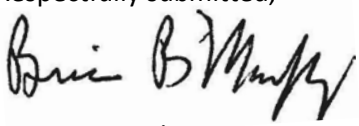
This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law. The scope of an actuarial valuation does not contain an analysis of the potential range of such future measurements.

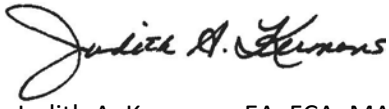
To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice promulgated by the Actuarial Standards Board. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. Brian B. Murphy, Judith A. Kermans and Heidi G. Barry are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The individuals submitting this report are independent of the plan sponsor.

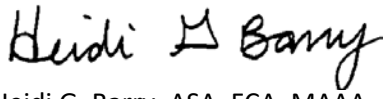
Respectfully submitted,



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



Judith A. Kermans, EA, FCA, MAAA



Heidi G. Barry, ASA, FCA, MAAA

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SECTION A

EXECUTIVE SUMMARY

Executive Summary

General Financial Objective. Section 24-7-401 (a) of the Arkansas Code provides as follows (emphasis added):

(1) The financial objective of the Arkansas Teacher Retirement System is to establish and receive contributions that expressed as percentages of active member payroll will **remain approximately level from generation to generation of Arkansas citizens.**
(2) Contributions received each year shall be sufficient:
  (A) To **fully cover the costs of benefit commitments** being made to members for their service being rendered **in that year**; and
  (B) To **make a level payment** that if paid annually over a reasonable period of future years will **fully cover the unfunded costs** of benefit commitments for service previously rendered.

Arkansas Teacher Retirement System Status: Based upon the results of the June 30, 2020 actuarial valuations, ***ATRS is satisfying the financial objective of level-contribution-percent financing.***

This report contains the results of the June 30, 2020 valuation. The table below shows a summary of the data used in the valuation. This data was the basis for determining valuation results and recommended employer contribution rates.

	Number	Average	Type of Average
Active not in T-DROP	66,900	$40,709	Pay
Active in T-DROP	3,639	63,477	Pay
Deferred Vested	13,338	5,464	Annual Projected Benefit
Retired	50,133	23,833	Annual Current Benefit
Total Members	**134,010**		

Included in the 2020 valuation were 4,019 reemployed retirees (included in the Retired data file) with total earnings of $123.1 million. ATRS receives full employer contributions on these individuals per Arkansas Code Section 24-7-708. The actuarial valuation assumes the number of working members will remain constant at the current level. In some recent years the total number of working members has decreased. A decreasing population means less contribution income for the retirement system than expected and can lead to funding difficulty in extreme cases. ATRS receives employer contributions on behalf of all working members.

Actuarial Assumptions: There were no assumption changes in the June 30, 2020 valuation. In our judgement the actuarial assumptions in use, and in particular the 7.50% investment return assumption, are reasonable for the purposes described in this report. However, it is possible that the 7.50% assumption may not satisfy actuarial standards for purposes of the June 30, 2021 valuation.

Benefit Changes: There were no benefit provision changes adopted for consideration in the June 30, 2020 valuation.

Executive Summary - (Continued)

Contribution Rate Changes

Employer and member contribution rates will change in the future according to the following schedule. This schedule of changes has been incorporated into the results shown in this report.

	Contribution Rate	
Fiscal Year	**Member**	**Employer**
2021	6.50%	14.50%
2022	6.75%	14.75%
2023 and Later	7.00%	15.00%

Results of the Valuation

The amortization period this year is 27 years, a decrease from last year's period of 28 years. This result is heavily dependent upon member and employer rates increasing in accordance with the schedule above. While 27 years is a reasonable period that meets statutory requirements, use of such a period will result in unfunded liabilities that are projected to increase in dollar amount for approximately the next 10 years. This condition is called "negative amortization" and is falling out of favor. The ATRS has targeted 18 years in recent legislation as the amortization period that would eliminate negative amortization. The contribution rate based upon the target amortization period (18 years) would be approximately 17.6% of payroll. On a market value basis, the amortization period is 47 years and the contribution rate based upon the market value and the target amortization period (18 years) would be approximately 20.7% of payroll.

The Arkansas Teacher Retirement System remains stable with an 80.6% funded position as of June 30, 2020. However, unless there is a large investment gain in Fiscal Year 2021, the amortization period is likely to increase in the next valuation due to the scheduled phase-in of net investment losses.

The rate of Investment return was (1.00)%# this year. As of June 30, 2020, the actuarial value of assets exceeded the market value of assets by approximately $1,105 million. (Please refer to page D-3 for details.) Investment gains and losses that occur each year are smoothed in over a 4-year period. After considering smoothing, the recognized return this year was 7.38%, compared to an assumed 7.50% return for Fiscal 2020.

\# *The actuary calculated this return figure which may not exactly match the investment consultant's figure.*

Experience Study

Every five years we typically perform a study that reviews the demographic and economic experience of the Arkansas Teacher Retirement System and then recommend changes in assumptions as appropriate and necessary to comply with Actuarial Standards of Practice. The last study covered the experience during the period July 1, 2010 to June 30, 2015. The next study will cover experience during the period July 1, 2015 to June 30, 2020. We would expect this study to be completed late in Fiscal 2021 and to affect the June 30, 2021 valuation.

Executive Summary - (Continued)

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.50% on the actuarial value of assets), it is expected that:

1) The unfunded actuarial accrued liabilities will be fully amortized after 27 years;
2) The funded status of the plan will increase gradually towards a 100% funded ratio; and
3) The unfunded accrued liability will increase for an extended period before beginning to decline.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

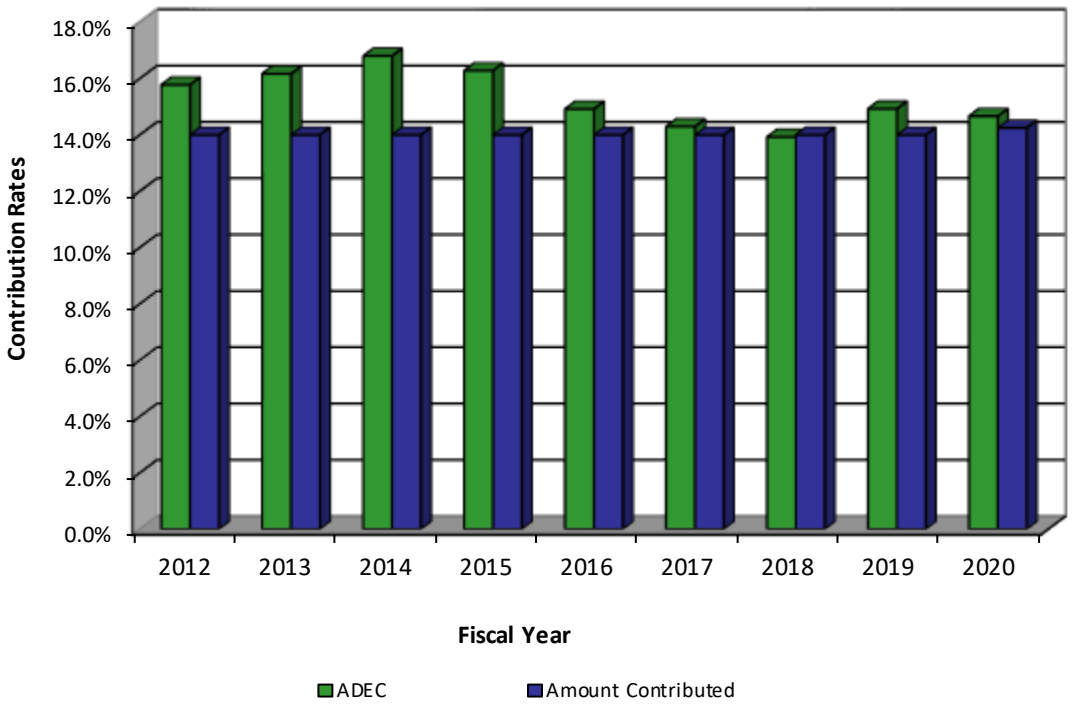
1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations; in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction;
2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit); and
3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

Limitations of Project Scope

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

Executive Summary - (Concluded)

The following graph shows a history of the amounts contributed vs. the employer contributions, based on a maximum amortization period of 30 years. The results would look different if the Actuarially Determined Employer Contribution (ADEC) were calculated according to the Board's target of 18 years.



The amount contributed is less than the 30-year contribution in FY 2012-2017 and FY 2019-2020. In FY 2018 (June 30, 2016 valuation), the amount contributed exceeded the 30-year contribution.

The calculated amortization period was 28 years in the June 30, 2018 valuation, which determined the FY 2020 ADEC, and was based on anticipated increases in the employer and member contribution rates. The employer and member rates are scheduled to increase by 0.25% increments through FY 2023. The ultimate employer and member contribution rates will be 15% and 7%, respectively. The FY 2020 employer contribution rate was 14.25% which was less than the 30-year contribution ADEC.

SECTION B

VALUATION RESULTS

Determination of Amortization Period
Computed as of June 30, 2020 and June 30, 2019

Computed Contributions for	Percents of Active Member Payroll			
	June 30, 2020			June 30, 2019
	Teachers	Support	Combined	Combined
Normal Cost				
Age & Service Annuities	10.47%	7.01%	**9.52%**	9.40%
Deferred Annuities	1.19%	2.10%	**1.44%**	1.44%
Survivor Benefits	0.36%	0.27%	**0.34%**	0.33%
Disability Benefits	0.48%	0.38%	**0.45%**	0.45%
Refunds of Member Contributions	0.47%	1.15%	**0.66%**	0.65%
Total	12.97%	10.91%	**12.41%**	12.27%
Average Member Contributions	6.54%	5.08%	**6.14%**	6.01%
Net Employer Normal Cost	6.43%	5.83%	**6.27%**	6.26%
Unfunded Actuarial Accrued Liabilities			**8.73%**	8.74%
Employer Contribution Rate (FY 2023 and later)			**15.00%**	15.00%
Amortization Years			**27**	28

The calculated amortization period of 27 years is based on anticipated increases in the employer and member contribution rates. The FY 2020 employer and member contribution rates were 14.25% and 6.25%, respectively. The employer and member rates are scheduled to increase by 0.25% increments ending in FY 2023. The ultimate employer and member contribution rates will be 15% and 7%, respectively, which are reflected in the above schedule.

The amortization period is the number of years it will take to pay off the unfunded liability of $4.3 billion, assuming that the employer contribution rate increases to 15% according to the schedule described above. Since 2000, the period has varied from a low of 19 years to a high of over 100 years. Unless there is a large investment gain in FY 2021, the amortization period is likely to increase in the next valuation. Please see additional comments regarding the amortization period on page A-2.

Computed Employer Contribution Rates
10-Year Comparative Statement

Valuation Date June 30	Active Members in Valuation **		Average Annual Pay		Consumer Price (Inflation) Index		Employer Contributions	
	Number	Annual Payroll ($ Millions)	Amount	% Change	Value	% Change	Computed Financing Period (Years)	Total Employer Rate
2011#*	76,780	$ 2,728	$ 35,534	7.7 %	$ 225.7	3.6 %	66	14.00 %
2012	75,627	2,714	35,891	1.0 %	229.5	1.7 %	over 100	14.00 %
2013#	74,925	2,727	36,400	1.4 %	233.5	1.8 %	70	14.00 %
2014	74,352	2,758	37,092	1.9 %	238.3	2.1 %	39	14.00 %
2015	72,919	2,777	38,088	2.7 %	238.6	0.1 %	33	14.00 %
2016	72,232	2,785	38,557	1.2 %	241.0	1.0 %	29	14.00 %
2017#*	72,148	2,814	38,997	1.1 %	245.0	1.6 %	29	14.00 %
2018#	72,341	2,872	39,702	1.8 %	252.0	2.9 %	28	14.00 %
2019#	72,164	2,907	40,285	1.5 %	256.1	1.6 %	28	14.00 %
2020#	70,539	2,954	41,884	4.0 %	257.8	0.6 %	27	14.25 %

* *Revised assumptions.*

\# *Legislated benefit or contribution rate changes; employer and employee rates scheduled to increase to 15% and 7%, respectively, in 4 steps beginning in FY 2020.*

** *Beginning with the June 30, 2011 valuation, active members include T-DROP members and payroll. ATRS also receives contributions on return to work retirees, but they are not included on this schedule.*

Computed Actuarial Liabilities
as of June 30, 2020

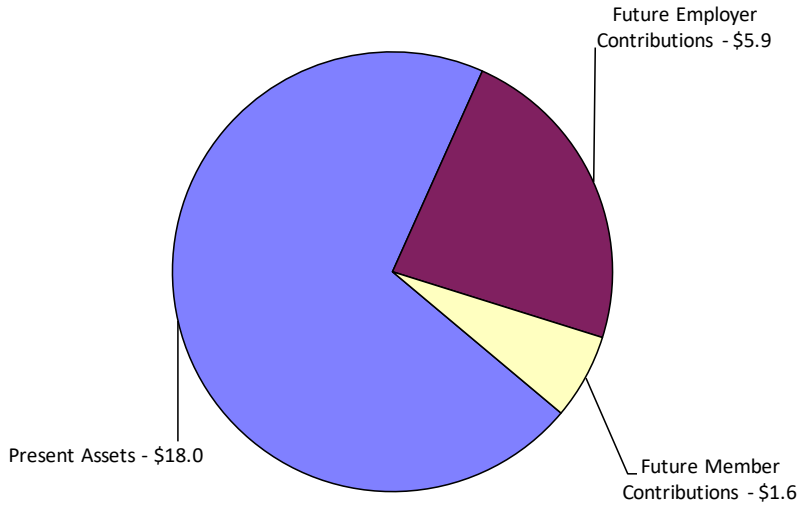
Actuarial Present Value of	(1) Total Present Value	Entry Age Actuarial Cost Method (2) Portion Covered by Future Normal Cost Contributions	Entry Age Actuarial Cost Method (3) Actuarial Accrued Liabilities (1)-(2)
Age and service retirement allowances based on total service likely to be rendered by present active members.	$ 8,809,878,956	$2,366,508,382	$ 6,443,370,574
Age and service retirement allowances based on total service likely to be rendered by present T-DROP members.	2,094,965,082	37,463,553	2,057,501,529
Vested deferred benefits likely to be paid present active and inactive members.	1,200,745,155	363,293,400	837,451,755
Survivor benefits expected to be paid on behalf of present active members.	227,351,121	83,651,519	143,699,602
Disability benefits expected to be paid on behalf of present active members.	223,891,916	110,542,993	113,348,923
Refunds of Member contributions expected to be paid on behalf of present active members.	20,994,586	154,718,473	(133,723,887)
Benefits payable to present retirees and beneficiaries.	12,890,407,230	0	12,890,407,230
Total	$25,468,234,046	$3,116,178,320	$22,352,055,726
Funding Value of Assets	18,007,255,143	0	18,007,255,143
Liabilities to be Covered by Future Contributions	$ 7,460,978,903	$3,116,178,320	$ 4,344,800,583

Liabilities for Retirees July 1, 2020
Tabulated by Type of Benefit Being Paid

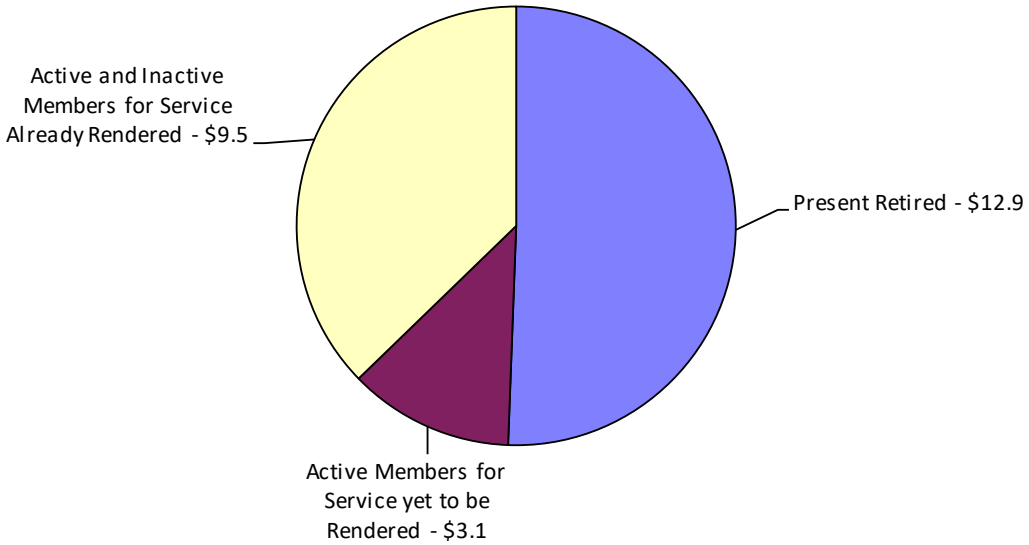
Type of Annuity	Liabilities July 1, 2020		
	Male	Female	Totals
RETIREMENT RESERVE ACCOUNT			
Age & Service Annuities			
Option 1 (Straight Life)	$ 1,477,891,132	$ 7,226,228,002	$ 8,704,119,134
Option A (100% Joint & Survivor)	862,169,701	942,271,791	1,804,441,492
Option B (50% Joint & Survivor)	417,157,271	669,272,830	1,086,430,101
Option C (10 Years Certain & Life)	32,055,250	139,692,971	171,748,221
Beneficiaries	62,673,177	176,688,851	239,362,028
Total Age & Service	2,851,946,531	9,154,154,445	12,006,100,976
Disability Annuities			
Option 1	48,829,970	278,936,507	327,766,477
Option A	28,000,427	45,204,019	73,204,446
Option B	5,957,969	13,034,930	18,992,899
Option C	-	1,238,758	1,238,758
Beneficiaries	20,033,099	23,381,962	43,415,061
Total Disability	102,821,465	361,796,176	464,617,641
Act 793	8,622,387	5,461,516	14,083,903
Retirement Reserve Account	2,963,390,383	9,521,412,137	12,484,802,520
Act 808 Retirement Reserve Account	6,822,070	2,806,135	9,628,205
Total Retirement Reserve Account	2,970,212,453	9,524,218,272	12,494,430,725
SURVIVORS' BENEFIT ACCOUNT			
Beneficiaries of Deceased Members	$ 48,892,768	$ 59,636,161	$ 108,528,929
RETIREMENT SYSTEM TOTALS			
Total Annuity Liabilities	$ 3,019,105,221	$ 9,583,854,433	$ 12,602,959,654
Cash Benefit Account Liabilities			158,330,186
Liabilities for Lump Sum Death Benefits			129,117,390
Total	$ 3,019,105,221	$ 9,583,854,433	$ 12,890,407,230

Financing $25.5 Billion of Benefit Promises for Present Active and Retired Members June 30, 2020

Sources of Funds
($ Billions)



Uses of Funds



Short Condition Test

ATRS' funding objective is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will ***pay all promised benefits when due -- the ultimate test of financial soundness***. Testing for level contribution rates is the long-term test.

A short condition test is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with: 1) Member contributions on deposit; 2) The liabilities for future benefits to present retired lives; and 3) The liabilities for service already rendered by members. In a system that has been following the discipline of level percent-of-payroll financing, the liabilities for member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the system. Liability 3 being fully funded is unusual, but highly desired.

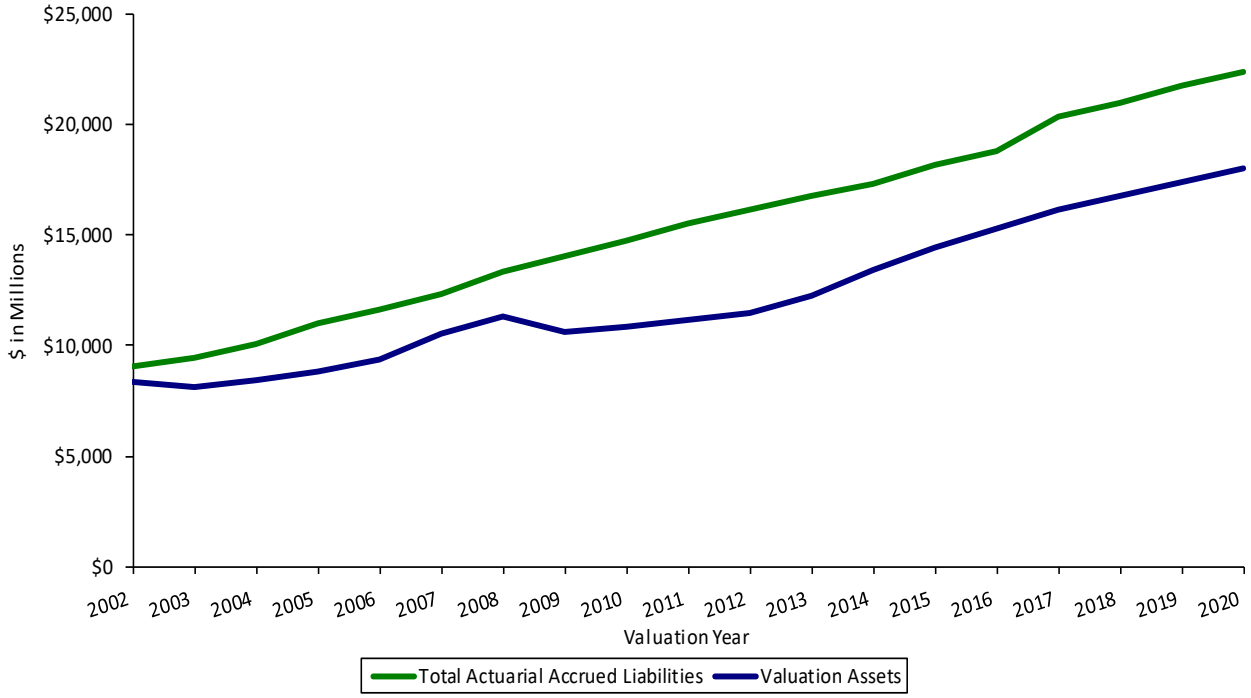
The schedule below illustrates the history of Liability 3 of the System and is indicative of the ATRS' objective of following the discipline of level percent-of-payroll financing.

Val. Date June 30	(1) Member Contrb.	(2) Retirees and Benef.	(3) Active and Inactive Members (Employer Financed Portion)	Present Valuation Assets	Portion of Present Values Covered by Present Assets			
					(1)	(2)	(3)	Total
	----------$ Millions----------							
2011#*	$ 929	$ 7,132	$ 7,460	$ 11,146	100%	100%	41%	72%
2012	981	7,649	7,509	11,484	100%	100%	38%	71%
2013#	1,027	8,181	7,510	12,247	100%	100%	40%	73%
2014	1,077	8,777	7,456	13,375	100%	100%	47%	77%
2015	1,128	9,778	7,230	14,434	100%	100%	49%	80%
2016	1,184	10,430	7,198	15,239	100%	100%	50%	81%
2017#*	1,254	11,337	7,707	16,131	100%	100%	46%	79%
2018	1,312	11,851	7,772	16,756	100%	100%	46%	80%
2019	1,377	12,460	7,872	17,413	100%	100%	45%	80%
2020	1,455	12,890	8,007	18,007	100%	100%	46%	81%

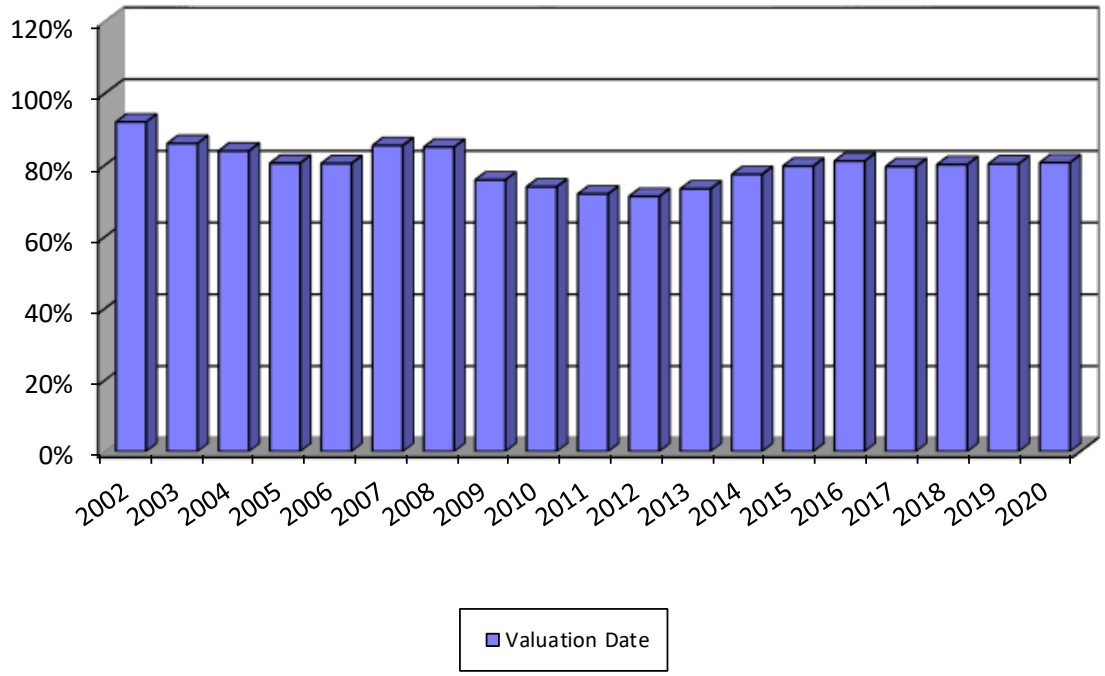
* *Revised actuarial assumptions or methods.*

\# *Legislated benefit or contribution rate change.*

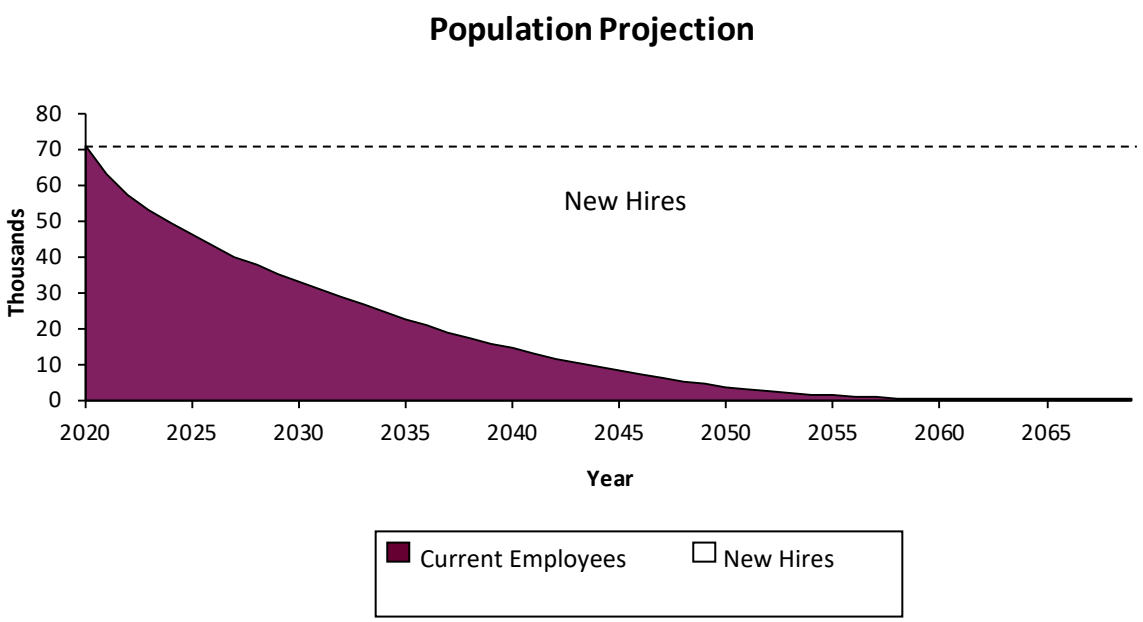
Actuarial Accrued Liabilities and Valuation Assets

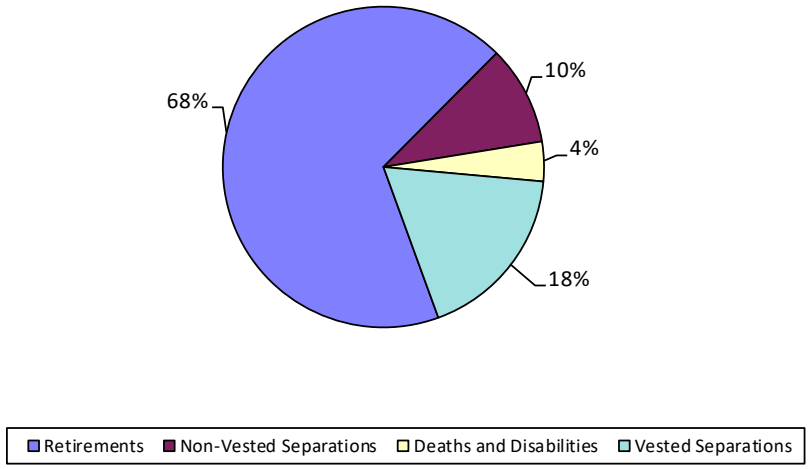


Valuation Assets as a Percent of Accrued Liabilities (Funded Ratio)



Expected Development of Present Population
June 30, 2020 (Excludes Rehired Retirees)





The charts show the expected future development of the present population in simplified terms. The Retirement System presently covers 70,539 active members (includes T-DROP). Eventually, 10% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. Approximately 86% of the present population is expected to receive monthly retirement benefits. Approximately 4% of the present population is expected to become eligible for death-in-service or disability benefits. Within nine years, over half of the covered membership is expected to consist of new hires.

SECTION C

SUMMARY OF BENEFITS

Summary of Provisions
June 30, 2020

1. **Voluntary Retirement** – **A.C.A. § 24-7-701.** A member may retire at age 60 with 5 or more years of credited service, or after 28 years of credited service regardless of age.

2. **Early Retirement – A.C.A. § 24-7-702.** A member who has more than 25 but less than 28 years of credited service and has not attained age 60 years may retire and receive an immediate early retirement annuity. The early annuity is an age & service annuity reduced by the lesser of (i) and (ii) below:

   (i) 10/12 of 1% multiplied by the number of months by which early retirement precedes completion of 28 years of service, or

   (ii) 10/12 of 1% multiplied by the number of months by which early retirement precedes the attainment of age 60 years.

   Act 750 of 2017 allows the ATRS Board to set by resolution the early annuity reduction at a rate between 5% and 15% per year, to be prorated monthly if the System's actuary certifies that the amortization period to pay the unfunded liabilities exceeds 18 years. The Board adjusted the reduction to 10% per year beginning August 1, 2017 by Resolution 2017-14 on April 17, 2017.

3. **Deferred Retirement – A.C.A. § 24-7-707.** An inactive member who has 5 or more years of credited ATRS service will be entitled to an age & service annuity beginning at age 60, provided accumulated contributions are on deposit with the retirement system.

4. **Disability Retirement – A.C.A. § 24-7-704.** An active member with 5 or more years of actual and reciprocal service, who becomes totally and permanently disabled may be retired and receive a disability annuity computed in the same manner as an age & service annuity. In order to qualify for disability retirement, the member must exhibit symptoms of physical or mental incapacitation while the member is an active member (Act 973 of 2011). A member who is eligible for age and service retirement (age 60 and 5 years of service or 28 years of service at any age) is no longer eligible to apply for disability retirement. Act 219 of 2015 requires an ATRS disability retiree to obtain a Social Security Administration determination letter finding that the retiree is disabled within 36 months of the effective date of disability retirement. If a member cannot provide the SSA determination letter within the 36-month period, benefits will be terminated, the member will be returned to active service, and all member history will be restored. The requirement to qualify for SSA disability shall not apply to a disability retiree who was age 57 or older before July 1, 2015, because that member would qualify for age & service benefits prior to requiring the SSA determination of disability. Additionally, the retiree may apply for an extension of the 36-month deadline if the retiree can demonstrate the SSA determination is in progress. Act 549 of 2017 allows a disabled retiree to return to work for an ATRS covered employer as a part-time employee or in a lesser position than held previously and not be disqualified from disability retirement.

4. **Disability Retirement – A.C.A. § 24-7-704 (Cont.)** If a retiree tries to return to full time employment, and fails, the suspended disability benefit will be restored to what it would have been had they not tried to return to work, or a recomputed benefit using the additional service, whichever is higher. Additionally, this act allows a retiree who was unable to secure a fully favorable Social Security disability determination letter to seek the ATRS medical committee's review of the case and its findings, which may find that the member is still disabled according to the ATRS definition of "disabled", shall be ruled as a final disposition in the matter.

5. **Final Average Salary (FAS) – A.C.A. § 24-7-736. The ATRS Board made changes to the final average salary by Resolution 2017-33 on November 13, 2017. Effective in Fiscal Year 2019, a member's final average salary is the average of the annual salaries paid during the period of 5 years of credited service producing the highest annual average. A benchmark 3-year FAS as of 6/30/2018 is established as a minimum FAS.** Beginning July 1, 2009, no salary paid in any year which is utilized in the computation of the members' final average salary, shall exceed the percentage increase of the base year, unless the difference in value between the next-highest year and the base year is within the amount of the salary differential (defined below). (Act 611 of 2017). If a member has a break in covered employment for eight years or more between any of the member's highest salary years used in the calculation of final average salary, then anti-spiking checking does not apply to the next highest year in the formula (Act 225 of 2011 – effective date of law July 27, 2011). There will no longer be any stacking of part-time college/teaching work for school district employees (Act 513 of 2011). Act 555 of 2013 limits the use of a reciprocal system's calculation of FAS if the ATRS member's reciprocal service credit is less than the number of years used to calculate the FAS for ATRS. Beginning July 1, 2014, if a member has less than three years of reciprocal service (the number of years used to calculate ATRS' FAS), then ATRS will obtain the salary and service credit from the reciprocal system, and use that salary and service as if it had all been earned in ATRS to calculate a FAS for retirement. Act 720 of 2013 made a minor change to final average salary for members who stop work during their last year of employment immediately before retirement. The Board may adjust the final average salary calculation by board resolution provided that the percentage range is no lower than 105% nor higher than 120% per year; and the salary differential is no lower than $1,250 nor higher than $5,000. Act 611 of 2017. The ATRS Board adjusted the percentage lower to 110% and salary differential allowance to $5,000 by Resolution 2017-13 on April 17, 2017.

6. **Age & Service Annuity and Disability Annuity – A.C.A. §§ 24-7-705, 24-7-727 (stipend). The annuity payable will not be less than the total of: years of contributory service times 2.15% of FAS; plus years of noncontributory service times 1.39% of FAS (1.25% for service earned after 2019); plus stipend for all members with 10 or more years of ATRS actual service.** Act 966 of 2013 allows the ATRS Board to set the contributory multiplier for service credit earned after June 30, 2013, within a range of 1.75% to 2.15%. The noncontributory multiplier for service credit earned after June 30, 2013, may be set within a range of 0.5% and 1.39%. In addition, this act would allow the Board to set special multiplier rates for the first 10 years of ATRS service earned after June 30, 2013, for both contributory and noncontributory service. This act is dependent upon the actuary's certification that the amortization period is in excess of 18 (Act 551 of 2017) years to pay unfunded liabilities prior to any reduction to the multipliers.

6. **Age & Service Annuity and Disability Annuity – A.C.A. §§ 24-7-705, 24-7-727 (stipend) Cont. By Board Resolution 2017-31 on November 13, 2017, the noncontributory multiplier will become 1.25% beginning in FY 2020. By Board Resolution 2017-32 on November 13, 2017, the contributory multiplier and noncontributory multiplier for the first 10 years of service has been reduced to 1.75% and 1.0% respectively beginning July 1, 2018. Once a member accrues 10 years of service, all service including the first 10 years is then credited at the standard rate in place at the time the service was earned.**

7. **T-DROP – A.C.A. §§ 24-7-1301–1316.** A member with 28 or more years of service may participate in the Teacher Deferred Retirement Option Plan (T-DROP, Act 1096 of 1995). T-DROP participants do not make member contributions. A T-DROP deposit is made monthly to the participant's T-DROP account. The T-DROP deposit is the amount that would have been paid had the member retired, reduced by 1% for each year of contributory, noncontributory, and reciprocal service (Act 605 of 2013). Members who enter T-DROP with less than 30 years of service are subject to an additional 6% reduction for each year less than 30 years. Act 750 of 2017 allows the Board to adjust the additional T-DROP reduction factor between ½% and 1% of the plan benefit for each month the member begins participating in the plan prior to having 30 years of credited service. T-DROP deposits are increased each year by 3% of the member's initial T-DROP deposit. T-DROP deposits cease at the earlier of 10 years of T-DROP participation or separation from service. T-DROP participants may continue in covered employment after 10 years of T-DROP participation, but do not accumulate additional T-DROP deposits. T-DROP participants receive interest annually on the balance of the T-DROP account. Regular T-DROP interest is credited for 10 or less years of participation. Post 10-year T-DROP interest is credited for more than 10 years of participation.

   Regular T-DROP interest is a combination of a fixed interest rate and an incentive interest rate. An incentive rate may be approved by the Board to encourage continued participation in T-DROP, if the estimated ATRS rate of return is 2% greater than the ATRS actuarial assumed rate of return in the preceding calendar year. Beginning in fiscal year 2019, the Board has set the Regular T-DROP fixed interest rate at 3% and the maximum incentive rate at 3% by Resolution 2017-35 on November 13, 2017. The fixed and incentive interest rates may be adopted by board resolution prior to the beginning of the fiscal year and would apply to subsequent fiscal years unless modified by the Board. For fiscal year 2020, the Board set the Regular T-DROP fixed interest rate at 3% and the incentive interest rate at 0%, resulting in a total interest rate of 3%, by Resolution 2019-09 on February 4, 2019.

   Post 10-year T-DROP interest has been in effect since July 1, 2010. Act 1049 of 2017 allows the Post 10-year T-DROP interest rate (24-7-1307) to be determined as appropriate by the Board and adopted by the resolution prior to the beginning of the fiscal year in which the interest rate shall apply. Post 10-year T-DROP interest is a combination of a variable interest rate and an incentive interest rate, to encourage continued participation in T-DROP. The Post 10-year T-DROP variable interest rate formula is based on investment returns and other factors. On November 13, 2017, the ATRS Board by Resolution 2017-36 set the formula for the variable interest rate and the maximum combined variable and incentive interest rate for fiscal year 2019 and beyond. The Post 10-year T-DROP variable interest rate is calculated as 2% less than the system's rate of return, but not less than 4%, nor greater than 6%. The maximum Post 10-year T-DROP combined interest rate including the incentive interest rate is 7.5%. The Post 10-year T-DROP incentive interest rate can be awarded if the estimated ATRS rate of

T-DROP – A.C.A. § 24-7-1301-1316 (Cont). return is 2% greater than the ATRS actuarial assumed rate of return in the preceding calendar year. For fiscal year 2020, the Board set the Post 10-year T-DROP variable interest rate at 4% and the incentive interest rate at 0%, resulting in a combined interest rate of 4%, by Resolution 2019-10 on February 4, 2019.

Upon actual retirement, the member may receive the T-DROP account balance in the form of a lump sum, a Cash Balance Account (CBA), or as an additional annuity. The T-DROP distribution may be a combination of lump sum, CBA, and additional annuity.

8. **Post-Retirement Increases – A.C.A. §§ 24-7-713, 24-7-727 (compound COLA).** Each July 1, annuities are adjusted to be equal to the base annuity times 100% plus 3% for each full year in the period from the effective date of the base annuity to the current July 1. The base annuity is the amount of the member's annuity on the later of July 1, 2001 or the effective date of retirement, as re-determined by Acts 396 of 1999 and 992 of 1997. The July 1, 2009 cost of living adjustment for retirees was compounded. The annuity was set to 103% of the June 30, 2009 retirement benefit amount. After it was calculated on July 1, 2009, the base amount was reset to be the July 1, 2009 benefit amount. Future cost of living raises will be established by the new updated base amount. Future cost of living adjustments will be evaluated on an annual basis to determine if a simple or compound cost of living increase will be given, depending on the financial condition of the System. Act 967 of 2013 gives the ATRS Board authority to reverse the compounding of a benefit and reset the base amount to the pre-compounding amount. If this reversal were to occur, it would include participants in the T-DROP plan. The future benefits of a member would not be reduced to recover any benefits paid to a member as a result of the compounding. In addition, the member's benefit on the date of the reversal would not be impacted, but future COLA's would be based upon the reset base amount. This act is dependent upon the actuary's certification that the amortization period is in excess of 30 years to pay unfunded liabilities prior to any reversal of the compounding of the COLA. Act 780 of 2017 allows the right to reverse the 2009 compound COLA when unfunded liabilities exceed an 18 year amortization. The act also allows a phase in of the change during months in which a COLA raise is given to prevent any retiree or option beneficiary from having an actual reduction in monthly benefit payments.

9. **Survivor Benefits – A.C.A. § 24-7-710.** Upon the death of an active member, who has 5 or more years of actual and reciprocal service, the following annuities are payable:

   (a) The surviving spouse receives an annuity computed in the same manner as if the member had (i) retired the date of his death with entitlement to an annuity, (ii) elected Option A - 100% Survivor Annuity, and (iii) nominated the spouse as joint beneficiary. If the member has attained age 60 and has acquired 5 years of credited service or has acquired 25 years of credited service regardless of age, the annuity begins immediately; otherwise the annuity begins the month following the date the member would have attained age 60. Under certain circumstances, a lump sum distribution may be made to the beneficiary(ies) of the deceased member.

Survivor Benefits – A.C.A. § 24-7-710. Cont.

(b) A surviving child's benefit is prorated to an amount equal to 1% of the member's highest salary year for each quarter of a year credited as actual service in the system, up to 20% or up to a maximum of $20,000 per year. If there is more than 1 surviving dependent, the benefits are capped to the lesser of 60% of the member highest salary or $60,000 per year to be divided equally among the dependents. Act 505 of 2017. A child is dependent until the child's death, marriage, or attainment of age 18 (age 23 if the child is a full-time student).

10. **Lump Sum Death Benefit – A.C.A. § 24-7-720.** Beneficiaries of deceased active members or retirees with 10 or more years of ATRS credited service are eligible to receive a lump sum death benefit of up to $10,000 ($6,667 for noncontributory service-benefit). The amount will be prorated for members who have both contributory service and noncontributory service. Members with 15 or more years of contributory service will receive the full $10,000 (Act 977 of 2011).

11. **Member Contributions – A.C.A. § 24-7-406.** Through FY 2019, contributory members contribute 6% of their salaries. Members that are participating in the T-DROP program or are working retirees do not make member contributions. If a member leaves service prior to becoming eligible to retire, the accumulated member contributions are returned upon request. No interest is credited to a member's contributions for the first year of membership; after 1 year, interest is credited. The ATRS Board set the interest rate on refunded contributions to 0.08% for fiscal year 2017 and beyond by Resolution 2017-17 on April 17, 2017. Act 550 of 2017 allows the ATRS Board to increase the employee contribution rate beyond 6% if the amortization period to pay the unfunded liabilities of the system exceeds 18 years. The Board set the member contribution rate to 6.25%, 6.50%, 6.75%, and 7.00% for FY 2020, FY 2021, FY2022, and FY 2023 and thereafter, respectively, by Resolution 2017-30 on November 13, 2017.

    Effective July 1, 1986, a noncontributory plan was created. Effective July 1, 1999 the default choice for new members is contributory. Effective July 1, 1997, all future member contributions are tax-deferred in accordance with §414(h) of the Internal Revenue Code of the United States. Effective July 1, 2005, all noncontributory members whose status changes from support to teacher (contracted for more than 181 days), will become contributory. Each July 1, members who previously elected to be noncontributory may elect to change to contributory status under Act 385 of 2005. The election is irrevocable.

12. **Act 808 Retirement – A.C.A. § 24-4-732.** Any employee of a state agency who was an active member of the Arkansas Teacher Retirement System on April 8, 1987, and who qualified for retirement before January 1, 1988, could become a member of the Arkansas Public Employees Retirement System and retire from that system. All credited service was transferred to that system but the member's contributions were retained by the Arkansas Teacher Retirement System and the benefit amount is transferred monthly to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).

13. **Act 793 Retirement – A.C.A. § 24-4-522.** Any employee who was a member of the rehabilitation services in 1977 was permitted to become a member of the Arkansas Public Employees Retirement System. Liabilities associated with prior service earned through June 30, 1978 remain in the Arkansas Teacher Retirement System. Future service is allocated to the Arkansas Public Employees Retirement System. Each July 1, annuities are adjusted by 3% (compound escalator).

14. **Retiree Benefit Stipend – A.C.A. § 24-7-713.** Each retired member as of June 30, 2008, with 5 or more years of ATRS credited service receives a $75 per month stipend. Members in T-DROP do not receive the $75 per month stipend until actual retirement. For all members retiring on or after July 1, 2008, a minimum of 10 years of ATRS credited service is required to receive the $75 per month stipend. Act 603 of 2013 allows the ATRS Board to increase or decrease the stipend to a minimum of $1 per month and a maximum of $75 per month. This act is dependent upon the actuary's certification that the amortization period is in excess of 18 years to pay unfunded liabilities prior to any reduction in the current stipend. The stipend for fiscal year 2018 remains at $75 per month. **By Board Resolution 2017-34 on November 13, 2017 the benefit stipend is removed from the base amount for all retirees and beneficiaries beginning in fiscal year 2019 and the benefit stipend will be reduced to $50.00 for fiscal year 2020 and beyond. The Resolution contains a "hold harmless" provision that prevents the lowering of the stipend if it would actually reduce the total monthly benefit. This would only affect retirees when the COLA is less than $25 per month.**

15. **Optional Forms of Benefits – A.C.A. § 24-7-706:**

    Option 1 ***(Straight Life Annuity)***

    A member will receive the maximum monthly benefit for which he/she qualifies, throughout his/her lifetime. No monthly benefits will be paid to his/her beneficiary after the member's death. Should a member die before he/she has drawn in benefits an amount equal to his/her contributions plus earned interest, the balance will be paid to a designated beneficiary. The designated beneficiary may be anyone chosen by the member.

    Option A ***(100% Survivor Annuity)***

    Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive the same annuity for the balance of his/her lifetime.

    Option B ***(50% Survivor Annuity)***

    Under this option a member will receive a reduced annuity throughout his/her lifetime. Upon the member's death, the designated beneficiary will receive one-half (1/2) of this annuity for the balance of his/her lifetime.

    Option C (*Annuity for Ten Years Certain and Life Thereafter*)

    A reduced monthly benefit payable for 120 months. After that time, a member's monthly allowance will revert to the amount he/she would have received under the regular plan and continue for life. If the member dies before receiving 120 payments, the designated beneficiary will receive a monthly benefit in the same amount until monthly benefits to both the member and the beneficiary equal 120 monthly payments. No further benefits are then payable to the beneficiary.

Pop-Up Election

Following the death of or a divorce from the member's designated beneficiary, his or her benefit reverts (pops-up) to the straight life annuity amount from the elected optional annuity amount. The member may then elect new beneficiaries in accordance with Arkansas Code and rules adopted by the ATRS board.

Option Factors are based upon a 5.0% interest rate and the RP-2014/MP2017 tables (static projection to 2022) adjusted with a 50% unisex mix.

16. **Refund of Member Contributions – A.C.A. § 24-7-711.** Any termination refund made to a member or a lump sum payout made to a surviving spouse after July 1, 2011, cancels all service credit, including noncontributory service credit (Act 976 of 2011); any repurchase of refunded service will be as contributory years at actuarial cost (Act 69 of 2011). Act 140 of 2013 specifies that all membership rights (including noncontributory service credit) and beneficiary designations to the ATRS are cancelled when a member gets a refund of his or her contributions.

17. **Contract Buyout – A.C.A. § 24-7-735.** During periods of contract buyout/litigation/termination, members will not receive service credit if no on-call service or on-site work is performed. ATRS will not allow the purchase of the time between actual work and the settlement (Act 163 of 2011) unless the settlement was made to resolve a claim of wrongful termination (Act 436 of 2017).

18. **Actuarial Cost of Service – A.C.A. §§ 24-1-107, 24-2-502, 24-7-202, 24-7-406, 24-7-501, 24-7-502, 24-7-612, 24-7-602, 24-7-603, 24-7-604, 24-7-606, 24-7-607, 24-7-610, 24-7-611.** Effective July 1, 2011, all service purchases will be at actuarial cost (Act 69 of 2011).

19. **Deceased Member Refund of Contributions – § 24-7-711.** Effective July 1, 2011, if a beneficiary is not eligible for survivor benefits, or if a surviving spouse is eligible and chooses a contribution refund, the interest on the refund stops the July 1 following the member's death (Act 136 of 2011).

20. **Limit Lookback to Five Years – A.C.A. §§ 24-7-202, 24-7-205.** Effective July 1, 2011, absent intentional nondisclosure, fraud, misrepresentation, criminal act, or obvious/documented error by an employer of ATRS members can no longer establish old service previously unreported unless such service is acquired by purchase at actuarial cost (Act 138 of 2011). Act 241 of 2017 allows ATRS to correct an understated service credit error upon which all required contributions have been paid, even if beyond the 5-year look-back period.

21. **Service Credit Requirements – A.C.A. §§ 24-7-501, 24-7-502, 24-7-601, 24-7-603, 24-7-604, 24-7-606, 24-7-607, 24-7-611.** Effective July 1, 2011, members must receive 160 days of service to be credited with a year of service credit (Act 974 of 2011).

22. **T-DROP Cash Balance Account.** Effective July 1, 2012, a T-DROP cash balance account was established that allows members exiting (retiring) from T-DROP to place all or a portion of their T-DROP proceeds into a Cash Balance Account (CBA) at ATRS. On November 13, 2017, by Resolution 2017-38 the Board set the CBA interest rate schedule based on years of participation as follows: 2.50% for year one, 2.75% for year two, 3.00% for year three, 3.25% for year four, 3.50% for year five, and 4.00% for year

six and beyond. Each fiscal year, the Board can grant an incentive interest rate to encourage continued participation in the CBA program. For fiscal year 2020, the Board did not grant CBA participants an incentive rate.

23. **Delinquent Member Contributions – A.C.A. § 24-7-205.** Act 336 of 2013 allows members to forfeit service credit for any contributory fiscal year for which there is a balance due to the system.

24. **Purchase of "Air Time" as a Result of Wrongful Termination – A.C.A. §§ 24-7-702, 24-7-735, 6-17-413.** Act 521 of 2013 allows a member to purchase service credit under a settlement agreement or court order to resolve a claim of wrong termination if the service credit is purchased from the date of termination by an ATRS employer to the date of the resolution of the dispute. This service credit would be purchased at actuarial cost.

25. **Buyout of Inactive Members—A.C.A. § 24-7-505.** Act 606 of 2013 allows the ATRS Board to create a voluntary "buyout plan" for inactive vested members. The System will make a one-time lump sum payment to a member, a surviving spouse, or an alternate payee in exchange for a member, surviving spouse, or alternate payee's cancellation of membership and retirement benefit rights. The buyout plan will be established by Board rules. The rule is 16-1 Cash and Savings Help Program for Members (CASH). This particular plan offering ended June 30, 2015. Depending upon the success of the plan, it may be extended by the Board. Act 647 of 2017 allows the buyout plan to be extended, modified, or expanded by board resolution. The ATRS Board expanded the CASH program to include all inactive vested members, regardless of service type by Resolution 2017-18 on May 10, 2017. The ATRS Board offered the FY 2020 CASH program for all inactive vested members to end on June 30, 2020 by Resolution 2019-30 on June 3, 2019.

26. **Private School Service—A.C.A. § 24-7-607.** Prior to Act 90 of 2015, private school service had to be recognized by the Arkansas Department of Education as positions that required the issuance of teaching licenses. The certification of this service credit was performed by one employee of the Arkansas Department of Education, and that one employee retired. Upon that employee's retirement, the Arkansas Department of Education no longer certified private school service credit. No certifications occurred for approximately a year until legislation could be passed to allow ATRS to make this determination. In addition, a distinction was made between certified and noncertified private school service credit. Certified private school service (basically administrative and teaching) could be purchased at actuarial cost, up to 15 years. Noncertified private school service could be purchased at actuarial cost, up to 5 years.

27. **Military Service Credit—A.C.A. § 24-7-602.** Act 301 of 2015 made technical corrections to the ATRS laws. In the military service credit section, ATRS was not in compliance with a state law that was passed in 2009, Act 295, which repealed the requirement for free military service credit to be granted only if the service was not credited under any other plan except Social Security and the requirement that receipt of a pension from the federal military retirement system paid solely for disability shall not be considered as having service with another retirement plan. The military technical corrections bill raised questions by some of the legislators, and Act 558 of 2015 was passed to further clarify military service credit. Compulsory military service was changed throughout the law to read: "federal military

draft". The word "honorable" was inserted before discharge in order for the member to obtain free military service credit throughout the law.

28. **Lump-Sum Payment of Reserve Value of Small Annuity—A.C.A. 24-7-716.** Prior to passage of Act 225 of 2015, ATRS would pay out a reserve value to a member whose monthly benefit was less than $20 per month. This was optional for the member. The reserve value was calculated by multiplying the annual annuity by the reserve factor for the member's age. Act 225 of 2015 repealed this law.

29. **Pension Advance Prohibition – A.C.A. § 24-7-715**. Prohibits a pension advance company from obtaining a retiree's benefit to repay a loan. Act 199 of 2017.

30. **Accrued Sick Leave – A.C.A. § 24-7-601.** Allows unused accrued sick leave, whether paid or unpaid, to count as service credit to determine retirement eligibility for survivor benefits and lump sum death benefits. One day of service shall be added to the service credit for the fiscal year of the member's death for each day of unused sick leave. This does not include catastrophic leave and other unused donated leave. Act 200 of 2017.

31. **Spousal Survivor Benefit – A.C.A. § 24-7-710.** Members may direct an alternative residual beneficiary to receive a lump sum payment of the member's residue amount or T-DROP balance. No spousal survivor benefits will be payable if an alternative beneficiary who is not the surviving spouse is designated by the member. Act 243 of 2017.

32. **Settlement Agreements – A.C.A. § 24-7-202, § 24-7-735.** Salary or service credit may be purchased as part of a settlement agreement between a member and his/her employer. Salary will be added to the salary at the time of purchase and will be determined using the same factors used to calculate an additional monthly benefit in the annuitization of a T-DROP distribution. It is assumed the member would have retired immediately at the time of the purchase. Act 436 of 2017.

33. **Outsourcing – A.C.A. § 24-7-506.** This Act defines outsourcing to mean employment for an ATRS covered employer through a third party, private employer, independent contractor, or other contractual relationship. This Act defines that a person who performs services that are necessary for the normal daily operation for an ATRS covered employer is considered an Embedded Employee. This Act gives the ATRS covered employer a one-time decision to choose between two options for handling their Embedded Employees. The decision must be made within 60 days after the effective date of this Act or that first outsourcing. The first option for the ATRS covered employer is to become a participating employer and make embedded employees participating members of ATRS. The second option for the ATRS covered employer is to become a Surcharge Employer and opt to pay a surcharge on the Embedded Employee's salary to ATRS to help cover the actuarial cost. The surcharge starts at ½% the first year and slowly rises to 3% over 4 years with a hard cap of 4%. The Embedded Employees of a Surcharge Employer will not be members of ATRS. The services necessary for normal daily operations include: substitute teaching, teacher's aides, food service, transportation service, custodial service, security services, and school nursing. Only those working on the premises are subject to the surcharge. The surcharge is ONLY on SALARY of embedded employees. All salary is reported in the aggregate with the contractor's salary amount being the final word unless it is clearly in error. The Division of Youth Services shall be a participating Employer and may designate any or all

Embedded Employees as members of ATRS. The law shall not apply to post-secondary higher education institutions. Act 575 of 2017.

34. **Concurrent Reciprocal Service Credit – A.C.A. § 24-7-601.** This act allows ATRS members with the option of waiving their ATRS service in the event the member had concurrent service in two (2) state-supported retirement systems. This Act gives the member the option to surrender either ATRS service or the reciprocal plan service. If a member worked full time under a reciprocal retirement system and only part-time under ATRS, this Act will allow the member to waive the ATRS service to obtain a higher benefit based upon the full-time service in the other system. This act will allow concurrent reciprocal members the option to voluntarily elect to waive service in ATRS. The member's employer-accrued contributions and employee-accrued contributions in the system remain with the system. Act 612 of 2017.

35. **Employer Contribution Rate – A.C.A. § 24-7-401.** Employer contributions are collected on active members, T-DROP participants (even those who work beyond the 10-year participation period), and working retirees (Act 743 of 2009). Through fiscal year 2019, the employer contribution rate is 14%. For the fiscal year beginning July 1, 2018, the Board may modify the employer contribution rate for future fiscal years above 14% in increments of 0.25% per fiscal year provided the system has a greater than 18-year amortization period to pay unfunded liabilities without an employer contribution rate of more than 14% limited to a maximum employer contribution rate of 15%. Act 821 of 2017. The Board set the employer contribution rate to 14.25%, 14.50%, 14.75%, and 15.00% for FY 2020, FY 2021, FY2022, and FY 2023 and thereafter, respectively, by Resolution 2017-40 on November 13, 2017.

36. **Forfeiture of Benefits by Certain Persons – A.C.A. §§ 24-1-301, 302, 303, 304, 305.** Act 756 of 2017 provides for a beneficiary's forfeiture of benefits under a public retirement system when the beneficiary unlawfully kills a member or retiree.

37. **Socially responsible investments – A.C.A. § 24-7-105.** Act 767 of 2017 provides that a decision on whether to invest, not invest, or withdraw from investment the funds of the Arkansas Teacher Retirement System or an alternate retirement plan of the system shall not be based on a consideration that the location of the investment, fund, company, or any other type of investment vehicle is in the State of Israel.

Sample Benefit Computations for a Member Retiring June 30, 2020

The data for the Example member is shown below:

A.	$35,000	Final Average Compensation
B.	32	Total Service Credit
C.	27	Contributory Service Credit
D.	60	Age of Retiree
E.	55	Age of Spouse
F.	100%	Percentage of Retirement Allowance to Continue to Spouse after Retiree's Death (Retiree Chooses this Percentage)

The computations that would be made for this case are:

		Annual
G.	Non-Contributory Base: 1.39% x A x B	$15,568
H.	Extra for Contributory: 0.76% x A x C	7,182
I.	Subtotal Benefit: G + H	22,750
J.	Health Stipend	600
K.	Total Benefit: I + J	23,350
L.	Adjustment for Line F election: (1 - 0.78571) x I	4,875
M.	Annual Amount Payable	$18,475

Projected Benefits, taking into account increases after retirement would be:

Year Ended June 30	Annual Amount
2021	$18,475
2022	19,011
2023	19,547
2024	20,083
2025	20,619

Thereafter, the amount would increase by $536 annually for life.

Sample T-DROP Benefit Computations for a Member Entering T-DROP June 30, 2020

The data for the Example member is shown below:

A.	$35,000	Final Average Compensation
B.	28	Total Service Credit
C.	28	Contributory Service Credit
D.	55	Age of Retiree

The computations that would be made for this case are:

			Annual Amount
E.	Non-Contributory Base:	1.39% x A x B	$13,622
F.	Extra for Contributory:	0.76% x A x C	7,448
G.	Reduction for T-DROP Plan: (1% for each year of service) 0.28 x (E+F)		5,900
H.	Reduction for Entering T-DROP with less than 30 years of service (6% for each year less than 30): 0.12 x (E + F - G)		1,820
I.	Annual Deposit E + F – G – H		$13,350

Projected Deposits, taking into account increases after DROP, and 5 years duration would be:

Year Ended June 30	Amount Deposited
2021	$13,350
2022	13,751
2023	14,151
2024	14,552
2025	14,952
Total	$70,756

The amount deposited, plus credited interest, can be paid as a lump sum or as an annuity. A portion of the deposits can also be placed into a Cash Balance account.

SECTION D

FINANCIAL INFORMATION

This information is presented in draft form for review by the System's auditor. Please let us know if there are any items the auditor changes so that we may maintain consistency with the System's financial statements.

Asset Valuation Method

An essential step in the valuation process is comparing valuation assets with computed liabilities. Valuation assets are those assets that are recognized for funding purposes.

Asset valuation methods are distinguished by the timing of the recognition of investment income. Total investment income is the sum of ordinary income and capital value changes. Under a pure market value approach, ordinary investment income and all capital value changes would be recognized immediately. Because of market volatility, use of pure market values in retirement funding can result in volatile contribution rates and unstable financial ratios, contrary to ATRS' objectives.

Under the ATRS asset valuation method (see page D-3), assumed investment return is recognized fully each year. Differences between actual and assumed investment return are phased-in over a closed four-year period. During periods when investment performance exceeds the assumed rate, the funding value will tend to be less than the market value. Conversely, during periods when investment performance is less than the assumed rate, funding value will tend to be greater than market value. If assumed rates are exactly realized for three consecutive years, funding value will become equal to market value.

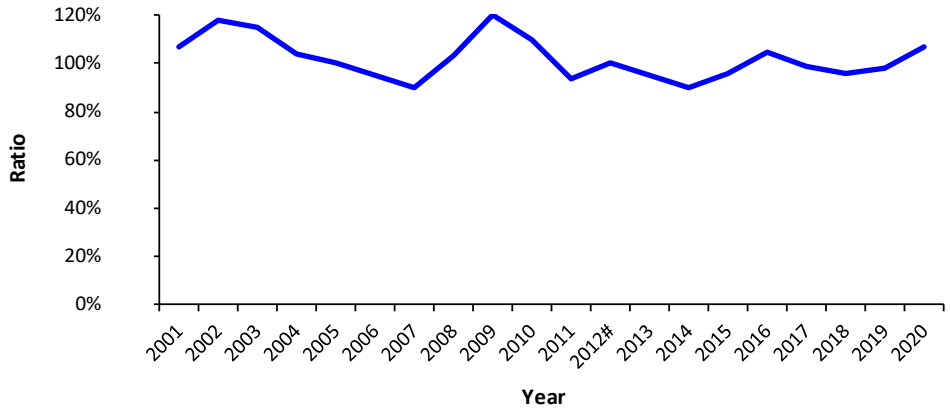
A multi-year comparison of market value to funding (actuarial) value is on the following page.

Asset Valuation Method

Valuation Date June 30	Market Value of Assets (1)	Actuarial Value of Assets (2)	Ratio of AV to MV (2) / (1)
2001	$ 7,643	$ 8,166	107%
2002	7,084	8,328	118%
2003	7,050	8,113	115%
2004	8,122	8,424	104%
2005	8,811	8,817	100%
2006	9,868	9,332	95%
2007	11,637	10,519	90%
2008	11,018	11,319	103%
2009	8,847	10,617	120%
2010	9,884	10,845	110%
2011	11,895	11,146	94%
2012#	11,484	11,484	100%
2013	12,830	12,247	95%
2014	14,856	13,375	90%
2015	15,036	14,434	96%
2016	14,559	15,239	105%
2017	16,285	16,131	99%
2018	17,493	16,756	96%
2019	17,742	17,413	98%
2020	16,902	18,007	107%

 # Actuarial Value set equal to Market Value.

Ratio of Actuarial Value to Market Value



This year the market value of assets is less than the actuarial value (see page A-2 for a more detailed explanation). To prevent unreasonably large differences between market value and actuarial value, there is a requirement that the recognized assets must always be between 80% and 120% of the market value (see page D-3).

Development of Funding Value of Assets

Year Ended June 30:	2017	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	$ 15,238,522,015	$ 16,131,466,927	$ 16,756,062,928	$ 17,412,534,651			
B. Market Value End of Year	16,284,808,245	17,492,627,740	17,741,621,773	16,902,076,224			
C. Market Value Beginning of Year	14,558,576,729	16,284,808,245	17,492,627,740	17,741,621,773			
D. Non-Investment Net Cash Flow	(555,761,481)	(606,938,770)	(642,256,050)	(665,324,622)			
E. Investment Return							
E1. Market Total: B - C - D	2,281,992,997	1,814,758,265	891,250,083	(174,220,927)			
E2. Assumed Rate	8.00%	7.50%	7.50%	7.50%	7.50%		
E3. Amount for Immediate Recognition	1,196,851,302	1,187,099,816	1,232,620,118	1,280,990,426			
E4. Amount for Phased-In Recognition: E1-E3	1,085,141,695	627,658,449	(341,370,035)	(1,455,211,353)			
F. Phased-In Recognition of Investment Return							
F1. Current Year: 0.25 x E4	271,285,424	156,914,612	(85,342,509)	(363,802,838)	Unknown	Unknown	Unknown
F2. First Prior Year	(276,749,871)	271,285,424	156,914,612	(85,342,509)	$ (363,802,838)	Unknown	Unknown
F3. Second Prior Year	(107,015,212)	(276,749,871)	271,285,424	156,914,612	(85,342,509)	$ (363,802,838)	Unknown
F4. Third Prior Year	364,334,750	(107,015,210)	(276,749,872)	271,285,423	156,914,613	(85,342,508)	$ (363,802,839)
F5. Total Recognized Investment Gain	**251,855,091**	**44,434,955**	**66,107,655**	**(20,945,312)**	(292,230,734)	(449,145,346)	(363,802,839)
G. Funding Value End of Year:							
G1. Preliminary Funding Value End of Year: A+D+E3+F5	**16,131,466,927**	**16,756,062,928**	**17,412,534,651**	**18,007,255,143**			
G2. Upper Corridor Limit: 120% x B	**19,541,769,894**	**20,991,153,288**	**21,289,946,128**	**20,282,491,469**			
G3. Lower Corridor Limit: 80% x B	**13,027,846,596**	**13,994,102,192**	**14,193,297,418**	**13,521,660,979**			
G4. Funding Value End of Year	**16,131,466,927**	**16,756,062,928**	**17,412,534,651**	**18,007,255,143**			
H. Actual/Projected Difference between Market and Funding Value	153,341,318	736,564,812	329,087,122	(1,105,178,919)	(812,948,185)	(363,802,839)	-
I. Market Rate of Return	15.98 %	11.36 %	5.19 %	(1.00)%			
J. Funding Rate of Return	9.68 %	7.78 %	7.90 %	7.38 %			
K. Ratio of Funding Value to Market Value	99.06 %	95.79 %	98.15 %	106.54 %			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed four-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. ***The Funding Value of Assets is unbiased with respect to Market Value.*** At any time, it may be either greater or less than Market Value. If assumed rates (applied to the funding value of assets) are exactly realized for three consecutive years, it will become equal to Market Value.

The assets of the Retirement System, as of June 30, 2020, were reported to your actuary to be $16,902,076,224. This amount, increased by a funding value adjustment of $1,105,178,919 this year, is used to finance the Retirement System liability.

Accounts	Assets at June 30	
	2020	2019
Regular Accounts		
Members' Deposit Accounts		
Contributions	$ 1,427,360,668	$ 1,348,149,014
Interest	8,609,929,516	9,669,786,261
Total	10,037,290,184	11,017,935,275
T-DROP Member Deposit Accounts		
Contributions	27,540,642	28,594,336
Interest	24,666,395	26,900,241
Total	52,207,037	55,494,577
Cash Balance Account	158,330,186	133,829,621
Employer's Accumulation Account	(6,237,130,081)	(5,848,501,337)
Retirement Reserve Account	12,379,405,139	11,844,778,384
Act 808 Retirement Reserve Account	9,635,773	11,497,384
T-Lump Payable	390,184,585	411,492,155
Survivors Benefit Account	102,904,403	105,863,197
Total Regular Accounts	16,892,827,226	17,732,389,256
Other Accounts		
Income Expense Account	9,248,998	9,232,517
Other Special Reserves	-	-
Miscellaneous	-	-
Total Other Accounts	9,248,998	9,232,517
Total Accounting Value of Assets	16,902,076,224	17,741,621,773
Funding Value Adjustment	1,105,178,919	(329,087,122)
Funding Value of Assets	$ 18,007,255,143	$ 17,412,534,651

Market Value of Assets

The net market value of assets at year-end was $16,902,076,224 and was invested as shown below:

	Market Value at June 30	
	2020	2019
Cash	$ 348,737,178	$ 256,387,142
Receivables		
Unsettled Trades and Accrued Return	35,276,529	60,000,798
Member Contributions	8,758,853	8,667,210
Employer Contributions	28,268,436	28,253,478
Other	607,309	571,587
Total Receivables	72,911,127	97,493,073
Investments		
Government Securities	28,245,622	50,473,001
Domestic Equities	2,517,950,607	2,472,540,708
International Equities	1,165,199,715	1,073,645,442
Commingled Funds	5,929,317,712	7,233,968,477
Corporate Bonds	925,185,002	1,076,593,959
Asset and Mortgage-backed Securities	23,104,762	39,156,489
Mortgages (CMO's)	-	-
Promissory Notes (BRS / Highland)	257,463,572	-
Alternative Investments	5,431,816,034	5,386,398,892
Limited Partnerships	28,276,070	72,122,080
Real Estate	52,674,001	52,354,702
Other Investments	176,000,000	-
Investment Derivative Instruments	(41,081)	(93,525)
Total Investments	16,535,192,016	17,457,160,225
Invested Securities Lending	315,851,510	469,822,525
Net Equipment	186,820	222,647
Deferred Outflows Related to OPEB	1,310,404	-
Total Assets	17,274,189,055	18,281,085,612
Liabilities		
Survivor Benefits for Minors	256,126	227,543
Other Payables	10,032,955	8,569,746
Securities Related Payables	45,253,144	60,879,610
Securities Lending Collateral	315,851,510	469,786,940
Deferred Inflows Related to OPEB	719,096	
Total Liabilities	372,112,831	539,463,839
Net Market Value	$ 16,902,076,224	$ 17,741,621,773
Change from Prior Year	(839,545,549)	248,994,033

Market Value Reconciliation

Assets developed during the year as follows:

	Year Ended June 30	
	2020	2019
Net Market Value July 1	$ 17,741,621,773	$ 17,492,627,740
Additions		
Employer Contributions	446,228,128	430,864,656
Employee Contributions	153,105,134	141,885,632
Appreciation	(269,255,966)	806,983,870
Interest	34,095,691	38,632,142
Dividends	101,648,812	92,234,448
Real Estate	7,545,561	7,671,704
Other	1,662,896	1,182,214
Securities Lending Activity	3,072,879	4,421,291
Total Additions	478,103,135	1,523,875,957
Deductions		
Age & Service Benefits	1,046,397,991	1,008,092,044
Disability Benefits	40,420,225	40,330,710
Option Benefits	31,767,042	30,013,681
Survivor Benefits	11,555,653	11,267,137
Reciprocal Service	58,429,113	55,891,519
Act 808	2,215,262	2,439,111
Refunds	9,592,091	9,679,783
Active Member Death	338,189	278,972
T-DROP Benefits	47,978,202	41,550,591
CBA Benefits	13,241,312	13,318,361
CASH Benefit Program	2,722,804	2,144,429
Investment Expense	44,536,364	52,740,802
Administrative Expense	8,454,436	7,134,784
Total Deductions	1,317,648,684	1,274,881,924
Miscellaneous	-	-
Net Market Value June 30	$ 16,902,076,224	$ 17,741,621,773

Schedule of Funding Progress
(Dollar Amounts in Millions)

Valuation Date June 30	(1) Actuarial Value of Assets	(2) Entry Age AAL	(3) UAAL (2)-(1)	(4) Funding Ratio (1)/(2)	(5) Annual Payroll	Liabilities as a % of Payroll		
						Unfunded (3)/(5)	Funded (1)/(5)	Total (2)/(5)
2000+	$ 7,620	$ 7,879	$ 259	96.7%	$ 1,485	17.4%	513.2%	530.6%
2001+	8,166	8,561	395	95.4%	1,557	25.4%	524.4%	549.8%
2002*	8,328	9,062	734	91.9%	1,628	45.1%	511.5%	556.6%
2003+	8,113	9,445	1,332	85.9%	1,683	79.1%	482.1%	561.2%
2004	8,424	10,050	1,626	83.8%	1,748	93.0%	481.9%	574.9%
2005	8,817	10,973	2,156	80.4%	1,962	109.9%	449.4%	559.3%
2006	9,332	11,623	2,291	80.3%	2,080	110.1%	448.7%	558.8%
2007+	10,519	12,329	1,810	85.3%	2,191	82.6%	480.1%	562.7%
2008+	11,319	13,334	2,015	84.9%	2,268	88.8%	499.1%	587.9%
2009	10,617	14,019	3,402	75.7%	2,318	146.8%	458.0%	604.8%
2010+	10,845	14,697	3,852	73.8%	2,381	161.8%	455.5%	617.3%
2011+*	11,146	15,521	4,375	71.8%	2,728	160.4%	408.6%	569.0%
2012	11,484	16,139	4,655	71.2%	2,714	171.5%	423.2%	594.7%
2013+*	12,247	16,718	4,471	73.3%	2,727	164.0%	449.1%	613.1%
2014	13,375	17,310	3,935	77.3%	2,758	142.7%	484.9%	627.6%
2015	14,434	18,136	3,702	79.6%	2,777	133.3%	519.8%	653.1%
2016	15,239	18,812	3,573	81.0%	2,785	128.3%	547.2%	675.5%
2017+*	16,131	20,298	4,167	79.5%	2,814	148.1%	573.2%	721.3%
2018+*	16,756	20,935	4,179	80.0%	2,872	145.5%	583.4%	728.9%
2019	17,413	21,709	4,296	80.2%	2,907	147.8%	599.0%	746.8%
2020	18,007	22,352	4,345	80.6%	2,954	147.1%	609.6%	756.7%

+ Legislated benefit or contribution rate change.

** Revised actuarial assumptions.*

A system with a high ratio of assets or liabilities to payroll will tend to experience more volatility than a system with a lesser ratio, assuming a similar asset allocation.

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures are discussed below and on the following pages. An additional historical summary of plan maturity measures can be found on page D-11.

	2020	2019	2018	2017	2016
Ratio of the Market Value of Assets to Total Payroll	5.7	6.1	6.1	5.8	5.2
Ratio of Actuarial Accrued Liability to Payroll	7.6	7.5	7.3	7.2	6.8
Ratio of Actives to Retirees and Beneficiaries	1.4	1.5	1.5	1.6	1.7
Ratio of Net Cash Flow to Market Value of Assets	-3.9%	-3.6%	-3.5%	-3.4%	-3.5%
Duration of the Present Value of Future Benefits	13.83	13.82	13.86	13.88	13.39

Ratio of the Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. The market value of assets is currently 5.7 times the payroll indicating that a return on assets 2% different from assumed would equal approximately 11% of payroll. Such a change could affect the amortization period by approximately five years based on 2020 results. While asset smoothing would reduce the effect, asset gains and losses much larger than 2% are common. An increasing level of this maturity measure generally indicates an increasing volatility in the amortization period.

Ratio of Actuarial Accrued Liability to Payroll

As the ratio of actuarial accrued liability to payroll increases, the amortization period becomes increasingly sensitive to the effects of demographic gains and losses, and assumption changes. For example, a 1% demographic gain or loss would correspond to 7.6% of payroll and would affect the amortization period by three years based on the 2020 results.

Ratio of Actives to Retirees and Beneficiaries

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

Ratio of Net Cash Flow to Market Value of Assets

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means benefits and expenses exceed contributions, and existing funds may be used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

Plan Maturity Measures
(Concluded)

Duration of Present Value of Future Benefits

The duration of the present value of future benefits may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, the current duration of 13.8 (which is based on a 7.5% discount rate) indicates that the present value of future benefits would increase approximately 13.8% if the assumed rate of return were lowered 1%. Such a change could affect the amortization period by 20 years or more.

Funded Ratio

The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

Ratio of Unfunded Actuarial Accrued Liability to Payroll

The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A value above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

Standard Deviation of Investment Return to Payroll

This measure illustrates the impact of a one standard deviation change in investment return as a percent of payroll. Investment return experience other than expected ultimately affects the employer contribution rates. The higher the ratio of this risk metric, the greater the expected volatility in employer contribution rates. Absent changes in investment policy, this metric is expected to increase as the assets grow to 100% of the AAL.

Additional Risk Assessment

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

Plan Maturity Measures (Based on Market Value of Assets)

Valuation Date June 30	(1) Accrued Liabilities (AAL)	(2) Market Value of Assets	(3) Unfunded AAL (1)-(2)	(4) Valuation Payroll	(5) % Change in Payroll	(6) Funded Ratio (2)/(1)	(7) Annuitant Liabilities (AnnLiab)	(8) AnnLiab/ AAL (7)/(1)	(9) Liability/ Payroll (1)/(4)	(10) Assets/ Payroll (2)/(4)	(11) Est. Porfolio Std. Dev.	(12) Std. Dev. % of Pay (10)x(11)	(13) Unfunded/ Payroll (3)/(4)	(14) Net External Cash Flow (NECF)	(15) NECF/ Assets (9)/(2)	(16) Portfolio Rate of Return	(17) 10-year Trailing Average
2010#	$ 14,697	$ 9,884	$ 4,813	$ 2,381	2.7%	67.2%	$ 6,516	44.3%	617.3%	415.1%			202.2%	$ (203)	-2.1%	14.2%	3.6%
2011#*	15,521	11,895	3,626	2,728	14.6%	76.6%	7,132	46.0%	569.0%	436.1%			132.9%	(201)	-1.7%	22.6%	6.1%
2012	16,139	11,484	4,655	2,714	-0.5%	71.2%	7,649	47.4%	594.7%	423.2%			171.5%	(285)	-2.5%	-1.1%	6.6%
2013#	16,718	12,830	3,888	2,727	0.5%	76.7%	8,181	48.9%	613.1%	470.5%			142.6%	(337)	-2.6%	14.9%	8.0%
2014	17,310	14,856	2,454	2,758	1.1%	85.8%	8,777	50.7%	627.6%	538.6%			89.0%	(395)	-2.7%	19.2%	8.2%
2015	18,136	15,036	3,100	2,777	0.7%	82.9%	9,778	53.9%	653.1%	541.5%			111.6%	(445)	-3.0%	4.3%	7.7%
2016	18,812	14,559	4,253	2,785	0.3%	77.4%	10,430	55.4%	675.5%	522.8%			152.7%	(505)	-3.5%	0.2%	6.3%
2017#*	20,298	16,285	4,013	2,814	1.0%	80.2%	11,337	55.9%	721.3%	578.7%			142.6%	(556)	-3.4%	16.0%	6.0%
2018	20,935	17,493	3,442	2,872	2.1%	83.6%	11,851	56.6%	728.9%	609.0%	12.7%	77.3%	119.9%	(607)	-3.5%	11.4%	7.6%
2019	21,709	17,742	3,967	2,907	1.2%	81.7%	12,460	57.4%	746.8%	610.3%	12.5%	76.3%	136.5%	(642)	-3.6%	5.2%	10.4%
2020	22,352	16,902	5,450	2,954	1.6%	75.6%	12,890	57.7%	756.7%	572.2%	12.5%	71.5%	184.5%	(665)	-3.9%	-1.0%	8.8%

(*) ATRS had experience studies in these years leading to a change or "true up" in actuarial assumptions. A pattern of periodic studies is a sign of a well-run system and suggests the extent to which the liability measures the actuary provides are likely to be realistic.

(#) ATRS had benefit changes in these years. Benefit increases cause liabilities to rise; benefit decreases cause liabilities to fall. In either case benefit changes affect the year by year comparability of the measures on this page.

(6). The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

(9) and (10) The ratios of liabilities and assets to payroll gives an indication of both maturity and volatility. Many systems have values between 500% and 700%. Values significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

(13) The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A value above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

(14) and (15) The ratio of Net External Cash Flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately -4%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

(16) and (17) Investment return is probably the largest single risk that most systems face. The year by year return and the 10-year geometric average give an indicator of the past performance of the investment program. Of course, past performance is not a guarantee of future results. Some of the trailing averaged are distorted by the extraordinary events of 2008.

SECTION E

COVERED MEMBER DATA

Active Members in Valuation June 30, 2020
by Attained Age and Years of Service
(Excludes T-DROP and Rehired Retirees)

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	420							420	$ 1,233,927
20-24	1,925	14						1,939	44,041,521
25-29	4,751	1,185	5					5,941	216,090,222
30-34	3,146	3,448	770	8				7,372	288,566,882
35-39	2,837	2,319	2,730	814	8			8,708	363,024,974
40-44	2,307	1,985	1,910	2,377	575	3		9,157	407,660,363
45-49	1,761	1,694	1,808	1,790	2,335	507		9,895	466,981,273
50-54	1,449	1,331	1,440	1,613	1,579	1,499	47	8,958	406,228,791
55-59	1,311	1,030	1,166	1,376	1,398	999	78	7,358	292,080,522
60	209	166	189	223	246	185	17	1,235	46,547,664
61	203	194	162	181	223	164	16	1,143	42,360,093
62	172	160	166	195	183	155	15	1,046	39,189,522
63	167	124	116	123	134	124	16	804	29,146,009
64	163	133	111	107	109	99	10	732	27,142,669
65	119	92	85	87	96	73	6	558	19,088,244
66	105	69	50	27	22	18	8	299	7,577,676
67	91	50	42	14	7	14	6	224	5,807,932
68	92	51	28	11	10	4	3	199	4,455,885
69	75	46	25	8	5	5	3	167	3,409,470
70 & Up	388	233	88	13	12	3	8	745	12,827,534
Totals	**21,691**	**14,324**	**10,891**	**8,967**	**6,942**	**3,852**	**233**	**66,900**	**$2,723,461,173**

Group Averages:

Age: 44.3 years

Service: 10.4 years

FEMALE Active Members in Valuation June 30, 2020
by Attained Age and Years of Service
(Excludes T-DROP and Rehired Retirees)

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	145							145	$ 445,062
20-24	1,418	8						1,426	33,289,113
25-29	3,602	926	2					4,530	161,437,125
30-34	2,459	2,599	595	1				5,654	210,973,953
35-39	2,341	1,834	2,104	640	4			6,923	274,674,315
40-44	1,874	1,604	1,505	1,872	454	2		7,311	310,269,285
45-49	1,346	1,359	1,492	1,464	1,783	406		7,850	352,688,092
50-54	1,088	1,012	1,174	1,389	1,292	1,168	28	7,151	310,761,804
55-59	879	725	907	1,149	1,203	810	54	5,727	220,582,701
60	136	117	139	181	207	150	15	945	33,801,606
61	130	138	119	149	191	146	13	886	32,087,708
62	110	108	127	153	158	137	13	806	29,709,783
63	104	75	76	97	108	101	10	571	20,005,552
64	88	85	87	84	92	86	8	530	19,451,865
65	60	54	62	65	81	58	6	386	13,084,658
66	60	40	40	18	19	16	6	199	5,273,622
67	53	32	24	12	5	13	3	142	3,835,917
68	50	23	17	8	7	3	2	110	2,611,677
69	39	21	14	6	3	4	3	90	1,808,023
70 & Up	185	112	40	9	7	3	6	362	6,078,669
Totals	**16,167**	**10,872**	**8,524**	**7,297**	**5,614**	**3,103**	**167**	**51,744**	**$2,042,870,530**

Group Averages:

Age: 44.2 years

Service: 10.7 years

MALE Active Members in Valuation June 30, 2020 by Attained Age and Years of Service (Excludes T-DROP and Rehired Retirees)

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	275							275	$ 788,865
20-24	507	6						513	10,752,408
25-29	1,149	259	3					1,411	54,653,097
30-34	687	849	175	7				1,718	77,592,929
35-39	496	485	626	174	4			1,785	88,350,659
40-44	433	381	405	505	121	1		1,846	97,391,078
45-49	415	335	316	326	552	101		2,045	114,293,181
50-54	361	319	266	224	287	331	19	1,807	95,466,987
55-59	432	305	259	227	195	189	24	1,631	71,497,821
60	73	49	50	42	39	35	2	290	12,746,058
61	73	56	43	32	32	18	3	257	10,272,385
62	62	52	39	42	25	18	2	240	9,479,739
63	63	49	40	26	26	23	6	233	9,140,457
64	75	48	24	23	17	13	2	202	7,690,804
65	59	38	23	22	15	15		172	6,003,586
66	45	29	10	9	3	2	2	100	2,304,054
67	38	18	18	2	2	1	3	82	1,972,015
68	42	28	11	3	3	1	1	89	1,844,208
69	36	25	11	2	2	1		77	1,601,447
70 & Up	203	121	48	4	5		2	383	6,748,865
Totals	**5,524**	**3,452**	**2,367**	**1,670**	**1,328**	**749**	**66**	**15,156**	**$ 680,590,643**

Group Averages:

Age: 44.5 years

Service: 9.5 years

Summary of Active Members
(Excludes T-DROP and Rehired Retirees)

	Teachers		Support		Total Active Members	
	No.	Valuation Payroll	No.	Valuation Payroll	No.	Valuation Payroll
Female	28,101	$ 1,448,310,780	23,643	$ 594,559,750	51,744	$ 2,042,870,530
Male	7,993	466,438,106	7,163	214,152,537	15,156	680,590,643
All	36,094	$ 1,914,748,886	30,806	$ 808,712,287	66,900	$ 2,723,461,173

	Teachers	Support	Total
Members Contributing Now	34,117	18,210	52,327
Members Not Contributing	1,977	12,596	14,573
All	36,094	30,806	66,900

June 30	Number	Group Averages			Active Member Payroll ($ Millions)
		Age	Service	Annual Earnings	
2003	62,432	44.0	9.5	$26,963	$1,683
2004	63,185	44.2	9.5	27,660	1,748
2005	65,793	44.2	9.4	29,826	1,962
2006	67,710	44.3	9.3	30,714	2,080
2007	69,226	44.4	9.3	31,645	2,191
2008	70,172	44.5	9.4	32,319	2,268
2009	70,655	44.7	9.5	32,804	2,318
2010	72,208	44.7	9.7	32,980	2,381
2011	72,293	44.8	9.9	33,995	2,458
2012	71,195	45.0	10.1	34,362	2,446
2013	70,660	45.0	10.2	34,920	2,467
2014	70,225	44.7	10.2	35,673	2,505
2015	68,945	44.6	10.3	36,717	2,531
2016	68,368	44.4	10.2	37,235	2,546
2017	68,337	44.3	10.2	37,707	2,577
2018	68,645	44.2	10.2	38,477	2,641
2019	68,457	44.1	10.1	39,065	2,674
2020	66,900	44.3	10.3	40,709	2,723

Deferred Vested Members at June 30, 2020
by Attained Age

Age	Number	Estimated Annual Benefits	Contribution Balance
Below 40	1,780	$ 9,839,221	$ 23,828,981
40	273	1,818,250	4,496,751
41	317	1,899,683	4,650,955
42	268	1,789,950	4,262,479
43	313	2,182,753	5,384,060
44	308	2,000,517	4,627,945
45	318	2,357,725	5,355,878
46	388	2,407,425	5,321,589
47	340	2,213,022	4,691,081
48	370	2,328,433	5,153,121
49	435	2,544,656	4,797,690
50	462	2,708,538	5,255,233
51	438	2,872,243	5,823,552
52	452	2,764,998	5,103,754
53	492	2,781,438	5,006,541
54	478	2,719,235	4,938,726
55	548	3,165,348	5,775,212
56	594	3,186,482	5,591,038
57	588	3,332,116	5,849,048
58	599	3,361,076	6,133,982
59	651	4,199,921	8,203,353
60 & Up	2,859	9,972,985	18,594,963
Future Beneficiaries #	67	428,118	0
Totals	**13,338**	**$ 72,874,132**	**$ 148,845,932**

 # These are beneficiaries of deceased active members who are eligible for a pension at age 62.

An inactive member is no longer actively working but has sufficient service credit to qualify for a monthly benefit at retirement age.

All Members Participating in T-DROP at June 30, 2020 by Attained Age

Age	Number	Current T-DROP Contribution	Original T-DROP Contribution	T-DROP Account Balance	Pay
48	4	$ 80,328	$ 77,989	$ 79,256	$ 239,074
49	5	59,769	57,095	93,042	228,492
50	38	828,893	799,885	1,001,332	2,498,123
51	109	2,431,253	2,325,262	3,686,296	7,139,965
52	158	3,433,265	3,247,365	6,597,610	9,921,525
53	218	4,802,002	4,500,248	10,783,867	14,130,918
54	247	5,614,889	5,187,272	15,885,472	16,393,424
55	286	6,415,308	5,849,600	21,890,554	18,562,495
56	321	7,064,703	6,359,247	28,280,642	20,477,943
57	342	7,869,756	6,957,505	36,650,614	22,011,996
58	343	7,882,128	6,930,823	44,680,653	21,955,666
59	343	7,505,935	6,732,095	48,957,530	21,605,075
60	320	6,378,901	6,297,122	47,210,402	20,348,329
61	268	4,668,679	5,245,077	41,093,817	16,980,787
62	239	3,860,288	4,354,738	34,458,284	14,411,824
63	175	3,053,351	3,306,338	24,416,425	10,652,280
64	131	2,294,478	2,393,004	18,384,458	7,867,970
65	34	497,964	556,611	3,868,616	1,908,838
66	21	453,137	404,461	3,323,446	1,307,066
67	12	123,993	198,894	2,429,287	760,675
68	11	184,471	178,708	1,496,111	657,435
69	6	92,982	108,679	1,017,132	373,661
70	3	74,750	61,195	595,218	195,764
71	1	-	23,788	336,662	76,462
72	4	65,799	75,996	707,098	285,758
Totals	**3,639**	**$ 75,737,022**	**$ 72,228,997**	**$ 397,923,824**	**$ 230,991,545**

A T-DROP member continues to work, but does not accrue additional retirement benefits and does not make member contributions. A reduced benefit is paid into the T-DROP account (see pages C-3 and C-4) during T-DROP participation. Deposits to T-DROP cease at 10 years of T-DROP participation. ATRS receives full employer contributions on behalf of T-DROP participants.

Active, T-DROP and Return to Work Members as of June 30, 2020

June 30	Number				Total Payroll
	Active	T-DROP	RTW	Total	$ Millions
2011	72,293	4,487	4,093	80,873	$ 2,818
2012	71,195	4,432	4,001	79,628	2,803
2013	70,660	4,265	4,025	78,950	2,819
2014	70,225	4,127	3,845	78,197	2,851
2015	68,945	3,974	3,741	76,660	2,874
2016	68,368	3,864	3,829	76,061	2,888
2017	68,337	3,811	3,881	76,029	2,922
2018	68,645	3,696	4,029	76,370	2,986
2019	68,457	3,707	4,077	76,241	3,027
2020	66,900	3,639	4,019	74,558	3,078

The actuarial valuation assumes the number of working members will remain constant at the current level. In some recent years the total number of working members has decreased. A decreasing population means less contribution income for the Retirement System than expected and can lead to funding difficulties in extreme cases.

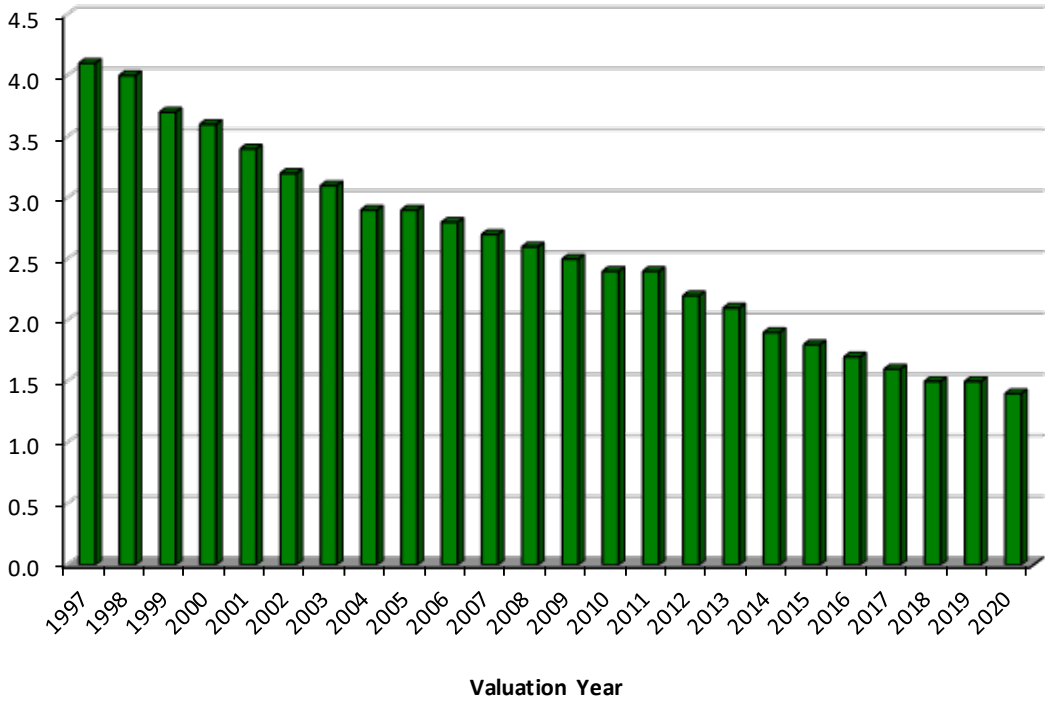
Annuities Being Paid Retirees and Beneficiaries July 1, 2020 by Type of Annuity Being Paid

Type of Annuity	No.	Annual Amounts		
		Original Annuities	Base Annuities	Current Annuities
RETIREMENT RESERVE ACCOUNT				
Age & Service				
Option 1 (Basic single life)	36,096	$ 562,170,863	$ 657,267,408	$ 856,909,819
Option A (Joint & 100% Survivor)	5,435	92,594,901	106,418,914	138,900,072
Option B (Joint & 50% Survivor)	2,684	60,704,168	72,554,882	94,895,106
Option C (10 year certain)	665	10,851,647	11,130,056	13,737,562
Beneficiaries	1,262	22,629,384	21,085,688	28,526,682
Totals	46,142	748,950,963	868,456,948	1,132,969,241
Disability				
Option 1	2,300	23,851,050	26,102,619	34,354,117
Option A	366	4,089,826	4,152,941	5,370,715
Option B	83	1,224,993	1,313,002	1,692,701
Option C	7	82,353	76,953	101,918
Beneficiaries	270	3,107,084	3,288,217	4,530,582
Totals	3,026	32,355,306	34,933,732	46,050,033
Act 793	158	$ 877,159	$ 1,784,395	1,784,395
Retirement Reserve Account	49,326	782,183,428	905,175,075	1,180,803,669
Act 808 Retirement Reserve Account	39	738,032	2,176,872	2,176,872
Total Retirement Reserve Account	49,365	782,921,460	907,351,947	1,182,980,541
SURVIVOR'S BENEFIT ACCOUNT				
Beneficiaries of Deceased Members	768	$ 8,185,296	$ 9,210,035	$ 11,843,667
RETIREMENT SYSTEM TOTALS				
Total Annuities Being Paid	50,133	$ 791,106,756	$ 916,561,982	$ 1,194,824,208

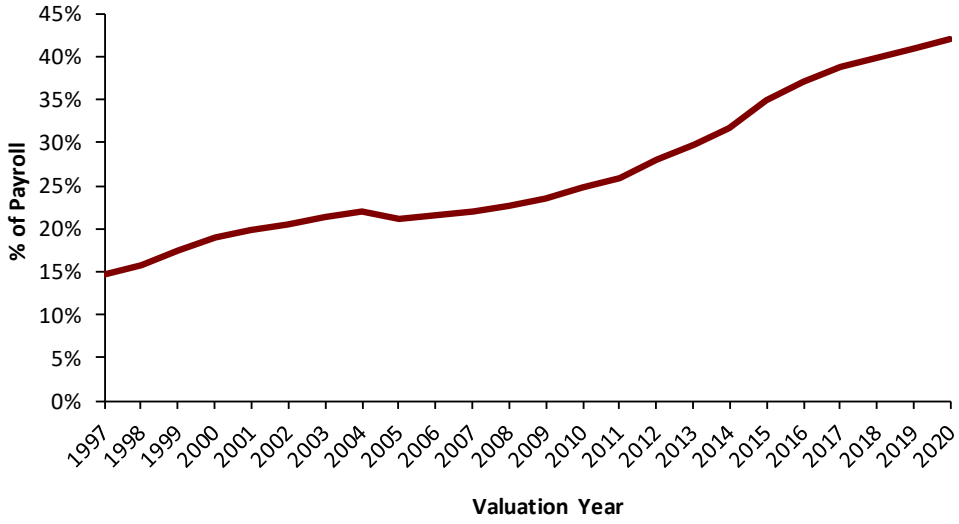
The Original Annuity is the annuity at the date of retirement.
The Base Annuity is the amount from which the 3.0% COLA is calculated.
The Current Annuity is the annuity payable at July 1, 2020 (Includes July 1 COLA).

Historical Graphs

Active Members Per Retired Life *



Retirement Benefits Being Paid as a Percent of Member Payroll *



** Beginning with the June 30, 2011 valuation, active members include T-DROP participants in payroll.*

Benefit Changes During Recent Years of Retirement and Related Changes in Purchasing Power (1990 $)

Year Ended June 30	Increase Beginning of Year+	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				1990 $	% of 1990
1990	$ - - - -	$ 11,000	- - - -	$ 11,000	100%
1991	330	11,330	(4.7)%	10,822	98%
1992	1,005	12,335	(3.1)%	11,429	104%
1993	1,045	13,380	(3.0)%	12,036	109%
1994	1,082	14,462	(2.5)%	12,693	115%
1995	400	14,862	(3.0)%	12,660	115%
1996	400	15,262	(2.8)%	12,652	115%
1997	772	16,034	(2.3)%	12,993	118%
1998	481	16,515	(1.7)%	13,161	120%
1999	1,383	17,898	(2.0)%	13,989	127%
2000	1,129	19,027	(3.7)%	14,336	130%
2001	1,406	20,433	(3.2)%	14,911	136%
2002	807	21,240	(1.1)%	15,337	139%
2003	562	21,802	(2.1)%	15,417	140%
2004	562	22,364	(3.3)%	15,314	139%
2005	562	22,926	(2.5)%	15,312	139%
2006	562	23,488	(4.3)%	15,037	137%
2007	562	24,050	(2.7)%	14,994	136%
2008	562	24,612	(5.0)%	14,611	133%
2009	562	25,174	1.4 %	15,161	138%
2010	755	25,929	(1.1)%	15,453	140%
2011	778	26,707	(3.6)%	15,370	140%
2012	778	27,485	(1.7)%	15,558	141%
2013	778	28,263	(1.8)%	15,723	143%
2014	778	29,041	(2.1)%	15,828	144%
2015	778	29,819	(0.1)%	16,232	148%
2016	778	30,597	(1.0)%	16,491	150%
2017	778	31,375	(1.6)%	16,638	151%
2018	778	32,153	(2.9)%	16,575	151%
2019	751	32,904	(1.6)%	16,687	152%
2020	451	33,355	(0.6)%	16,807	153%
2021	751	34,106			

* *The $11,000 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount could show a smaller purchasing power loss in percent loss.*

\# *Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).*

Benefit Changes During Recent Years of Retirement and Related Changes in Purchasing Power (2000 $)

Year Ended June 30	Increase Beginning of Year+	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				2000 $	% of 2000
2000	$ - - - -	$ 11,600	- - - -	$ 11,600	100%
2001	1,003	12,603	(3.2)%	12,207	105%
2002	523	13,126	(1.1)%	12,579	108%
2003	372	13,498	(2.1)%	12,668	109%
2004	372	13,870	(3.3)%	12,605	109%
2005	372	14,242	(2.5)%	12,624	109%
2006	372	14,614	(4.3)%	12,417	107%
2007	372	14,986	(2.7)%	12,400	107%
2008	372	15,358	(5.0)%	12,100	104%
2009	372	15,730	1.4 %	12,573	108%
2010	472	16,202	(1.1)%	12,815	110%
2011	486	16,688	(3.6)%	12,746	110%
2012	486	17,174	(1.7)%	12,902	111%
2013	486	17,660	(1.8)%	13,039	112%
2014	486	18,146	(2.1)%	13,125	113%
2015	486	18,632	(0.1)%	13,460	116%
2016	486	19,118	(1.0)%	13,675	118%
2017	486	19,604	(1.6)%	13,797	119%
2018	486	20,090	(2.9)%	13,745	118%
2019	459	20,549	(1.6)%	13,831	119%
2020	159	20,708	(0.6)%	13,848	119%
2021	459	21,167			

* *The $11,600 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount could show a smaller purchasing power loss in percent loss.*

\# *Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).*

Benefit Changes During Recent Years of Retirement and Related Changes in Purchasing Power (2010 $)

Year Ended June 30	Increase Beginning of Year+	Benefit Dollars in Year*	Inflation (Loss) in Year#	Purchasing Power at Year End	
				2010 $	% of 2010
2010	$ - - - -	$ 11,900	- - - -	$ 11,900	100%
2011	357	12,257	(3.6)%	11,836	99%
2012	357	12,614	(1.7)%	11,981	101%
2013	357	12,971	(1.8)%	12,108	102%
2014	357	13,328	(2.1)%	12,188	102%
2015	357	13,685	(0.1)%	12,499	105%
2016	357	14,042	(1.0)%	12,699	107%
2017	357	14,399	(1.6)%	12,812	108%
2018	357	14,756	(2.9)%	12,764	107%
2019	330	15,086	(1.6)%	12,837	108%
2020	30	15,116	(0.6)%	12,780	107%
2021	330	15,446			

* *The $11,900 benefit used to begin this schedule is an arbitrary amount. A smaller beginning amount could show a smaller purchasing power loss in percent loss.*

\# *Based on Consumer Price Index, All Urban Consumers, United States City Average (June values).*

SECTION F

FINANCIAL PRINCIPLES

Financial Principles and Operational Techniques

Promises Made and To Be Paid For. As each year is completed, the System, in effect, hands an "IOU" to each member then acquiring a year of service credit. The "IOU" says: "The Arkansas Teacher Retirement System owes you one year's worth of retirement benefits, payments in cash commencing when you qualify for retirement."

The related ***key financial questions*** are:
Which generation of taxpayers contributes the money to cover the IOU?
The present taxpayers, who receive the benefit of the member's present year of service?
Or the future taxpayers, who happen to be in Arkansas at the time the IOU becomes a cash demand?

The financial objective of the ATRS is that this year's taxpayers contribute the money to cover the IOUs being handed out this year so that ***the employer contribution rate will remain approximately level from generation to generation*** -- our children and our grandchildren will not have to contribute greater percents of pay than we contribute now. This objective was set forth in Act 793 of 1977.

(There are systems which have ***a design for deferring contributions to future taxpayers***, lured by a lower contribution rate now and putting aside the fact that the contribution rate must then relentlessly grow much greater over decades of time -- consume now, and let your children face higher contribution rates after you retire.)

An inevitable byproduct of the level-cost design is the accumulation of reserve assets for decades and the income produced when the assets are invested. ***Investment income*** becomes the ***third and largest contributor*** for benefits to employees, and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

> Normal Cost (the cost of members' service being rendered this year)
> … plus …
> Interest on Unfunded Actuarial Accrued Liabilities (unfunded accrued liabilities are the difference between (i) liabilities for service already rendered and (ii) the accrued assets of the plan).

Computing Contributions to Support System Benefits. From a given schedule of benefits and from the employee data and asset data furnished, the actuary determines the contribution rates to support the benefits, by means of ***an actuarial valuation***. An actuarial valuation has a number of ingredients such as: the rate of investment income which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement. In an actuarial valuation, assumptions must be made as to what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the System can indicate the degree of accuracy of the assumptions.

Reconciling Differences Between Assumed Experience and Actual Experience. Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the accuracy of the various financial assumptions or the skill of the actuary and the precision of the calculations made. The System copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is continual adjustments in financial position.

Actuarial Valuation Process

The financing diagram on the next page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program), and is thus an ***increasing contribution method***; and the ***level contribution method*** which equalizes contributions between the generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. ***Census Data***, furnished by plan administrator
   Retired lives now receiving benefits
   Former employees with vested benefits not yet payable
   Active employees

B. + ***Asset data*** (cash & investments), furnished by plan administrator

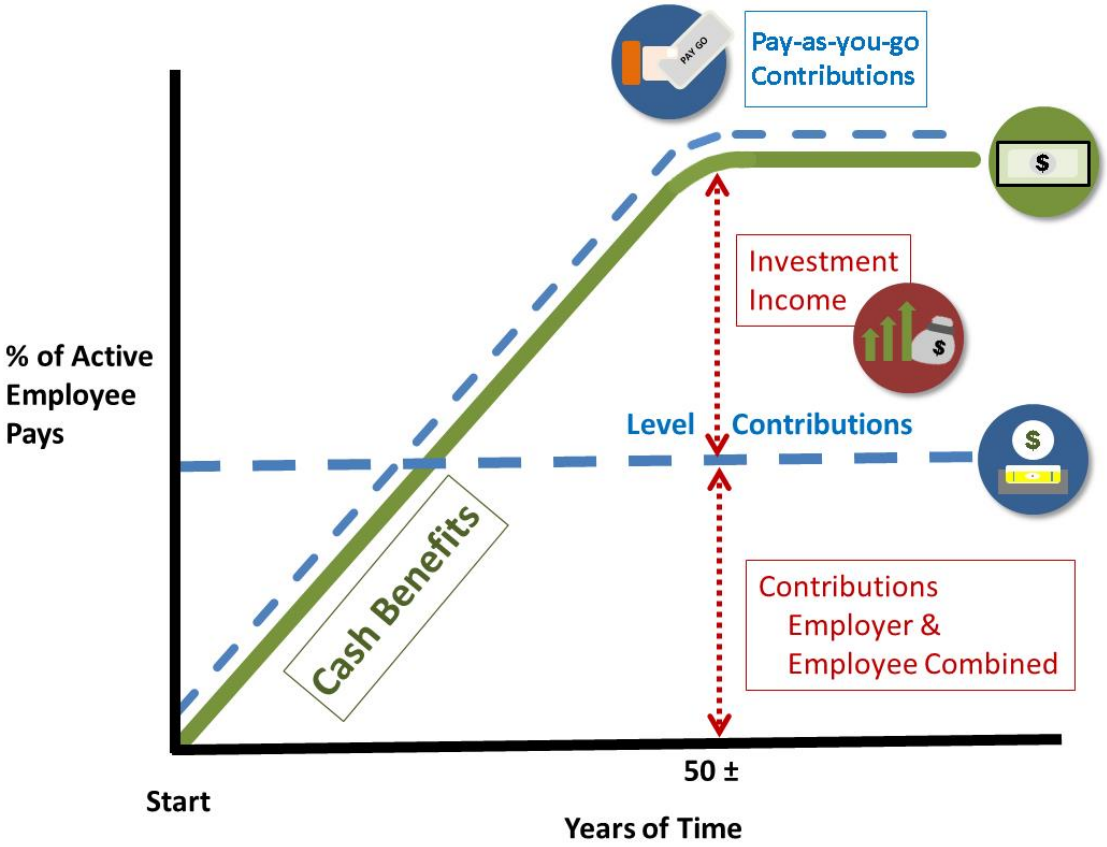
C. + **Benefit provisions** that establish eligibility and amounts of payments to members

D. + ***Assumptions concerning future financial experiences in various risk areas***, which assumptions are established by the Board of Trustees after consulting with the actuary.

E. + ***The funding method*** for employer contributions (the long-term planned pattern for employer contributions)

F. + ***Mathematically combining the assumptions, the funding method, and the data***

G. = Determination of:
   Plan financial position, and/or
   New Employer Contribution Rate



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- **Non-Economic Risk Areas**
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

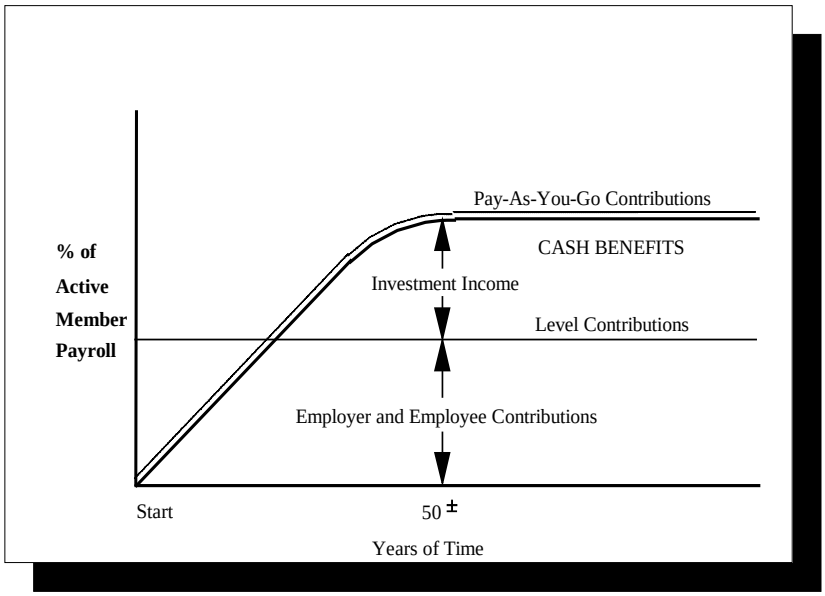
SECTION G

ACTUARIAL ASSUMPTIONS

Selection of Assumptions Used in Actuarial Valuations

Economic Assumptions

Investment return
Pay increases to individual employees:
  the portion for economic changes
Active member group size and
  total payroll growth



Demographic Assumptions

Actual ages at service retirement
Pay increases to individual members:
  the portion for merit & seniority
Disability while actively employed
Separations before retirement
Mortality after retirement
Mortality before retirement

Relationship Between Plan Governing Body and the Actuary

The actuary should have the primary responsibility for choosing the ***demographic*** assumptions used in the actuarial valuation, making use of specialized training and experience.

The actuary and other professionals can provide guidance concerning the choice of suitable economic assumptions.

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standards of Practice (ASOP) No. 27. The standard requires that the selected economic assumptions be consistent with each other. That is, the selection of the investment return assumption should be consistent with the selection of the payroll growth and inflation assumptions.

ASOP No. 27 defines a reasonable economic assumption as an assumption that has the following characteristics: (a) It is appropriate for the purpose of the measurement; (b) It reflects the actuary's professional judgment; (c) It takes into account historical and current economic data that is relevant as of the valuation date; (d) It reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and (e) It has no significant bias (i.e., it is not significantly optimistic or pessimistic), except when provisions for adverse deviation or plan provisions that are difficult to measure are included and disclosed under Section 3.5.1, or when alternative assumptions are used for the assessment of risk.

Summary of Assumptions Used in Actuarial Valuations for the Arkansas Teacher Retirement System Assumptions Adopted by the Board of Trustees After Consulting with Actuary

The actuarial assumptions used in the valuation are shown in this section. The rationale for the assumptions is provided in the Experience Study covering the period July 1, 2010 through June 30, 2015. The Board of Trustees adopts the actuarial assumptions used for actuarial valuation purposes after consulting with the actuary. The actuarial assumptions represent estimates of future experience.

Economic Assumptions

The ***price inflation*** assumption is 2.50% although no specific Price Inflation is needed for this valuation. It is assumed that the 3% COLA will always be paid.

The investment return rate used in the valuation was 7.50% per year, compounded annually (net after administrative expenses). This rate was first used for the ***June 30, 2017*** valuation. The assumed real rate of return over price inflation is 5%.

Pay increase assumptions for individual active members are shown on pages G-7 and G-8. Part of the assumption for each age is for a merit and/or seniority increase, and the other 2.75% recognizes wage inflation. These rates were first used for the ***June 30, 2017*** valuation.

The Active Member Group (Active, T-DROP, RTW) size is assumed to remain constant at its present level.

The ***wage inflation*** assumption is 2.75%. This consists of 2.50% related to pure price inflation and 0.25% related to general economic improvements.

Total active member payroll is assumed to increase 2.75% per year, which is the portion of the individual pay increase assumptions attributable to wage inflation. This rate was first used for the ***June 30, 2017*** valuation.

Non-Economic Assumptions

The mortality tables used were the RP-2014 Healthy Annuitant, Disabled Annuitant and Employee Mortality headcount weighted tables for males and females. Mortality rates were adjusted for future mortality improvements using projection scale MP-2017 from 2006. Related values are shown on page G-4. These tables were first used for the ***June 30, 2017*** valuation.

A limited fluctuation credibility procedure was used to determine the appropriate scaling factor of each gender and each member classification (see the 2010-2015 Experience Study), and are shown below:

	Scaling Factor
Healthy Male Retirees	**101%**
Healthy Female Retirees	**91%**
Disabled Male Retirees	**99%**
Disabled Female Retirees	**107%**
Male Active Members	**94%**
Female Active Members	**84%**

The probabilities of retirement for members eligible to retire are shown on pages G-5 and G-6. The rates for full retirement and reduced retirement were first used in the ***June 30, 2017*** valuation.

The probabilities of withdrawal from service, ***death-in-service*** and ***disability*** are shown for sample ages on pages G-7 and G-8. These rates were first used in the ***June 30, 2017*** valuation.

The entry age actuarial cost method of valuation was used in determining accrued liabilities and normal cost.

Differences in the past between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities.

Unfunded actuarial accrued liabilities are amortized to produce contribution amounts (the total of principal & interest) which are level percents of payroll contributions.

These cost methods were first used in the June 30, 1986 valuation.

The Fiscal Year 2020 employer and member contribution rates were 14.25% and 6.25%, respectively. The employer and member rates are scheduled to increase by 0.25% increments ending in Fiscal Year 2023. The ultimate employer and member contribution rates will be 15% and 7%, respectively. The projected unfunded actuarial accrued liabilities were increased when developing the amortization period to account for the temporary shortfalls in the employer and employee contribution rates.

Asset Valuation Method. A market value related asset method is used as described on page D-1. This method was first used in the June 30, 1995 valuation. It was modified following the 1997-2002 Experience Study to include an 80% - 120% market value corridor.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary. Members whose dates of birth were not supplied were assumed to be 40 years old on the valuation date. Members whose salaries were not supplied and that entered T-DROP were assumed to have the group average pay of those with salary data as of the valuation date that entered T-DROP.

Single Life Retirement Values*

Sample Attained Ages in 2020	Present Value of $1.00 Monthly for Life		Present Value of $1 Monthly for Life Increasing 3.0% Annually		Future Life Expectancy (Years)		Percent Dying within Next Year	
	Male	Female	Male	Female	Male	Female	Male	Female
40	$150.86	$154.28	$198.83	$205.26	42.75	47.01	0.33 %	0.29 %
45	146.93	151.53	191.45	199.63	37.96	42.19	0.41 %	0.32 %
50	141.81	147.68	182.25	192.21	33.25	37.38	0.53 %	0.36 %
55	135.20	142.30	170.95	182.48	28.67	32.58	0.70 %	0.44 %
60	126.90	135.25	157.44	170.40	24.25	27.89	0.97 %	0.60 %
65	116.81	126.22	141.80	155.77	20.07	23.36	1.36 %	0.82 %
70	104.59	114.70	123.92	138.24	16.15	19.02	1.96 %	1.23 %
75	90.13	100.68	103.98	118.20	12.52	14.95	3.05 %	2.03 %
80	74.03	84.67	83.07	96.67	9.29	11.30	5.05 %	3.45 %
85	57.74	67.75	63.07	75.22	6.61	8.19	8.67 %	6.07 %
Base	2635 x 1.01	2636 x 0.91	2635 x 1.01	2636 x 0.91				
Projection	939	940	939	940				

* *Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the MP-2017 projection scale.*

Sample Attained Ages in 2020	Benefit Increasing 3.0% Yearly	Portion of Age 60 Lives Still Alive	
		Male	Female
60	$100.00	100%	100%
65	115.00	95%	97%
70	130.00	88%	92%
75	145.00	79%	86%
80	160.00	67%	77%
Ref		2635 x 1.01	2636 x 0.91

Probabilities of Retirement for Members

Retirement Ages	% of Active Participants Retiring with Unreduced Benefits			
	Education		Support	
	Male	Female	Male	Female
48	8%	7%	8%	6%
49	8%	7%	8%	6%
50	8%	7%	8%	6%
51	8%	7%	8%	6%
52	8%	7%	8%	6%
53	8%	7%	8%	6%
54	8%	7%	8%	6%
55	8%	9%	8%	6%
56	8%	9%	8%	6%
57	8%	11%	8%	11%
58	8%	11%	8%	11%
59	17%	14%	8%	15%
60	17%	17%	13%	13%
61	24%	17%	13%	15%
62	24%	29%	28%	23%
63	27%	26%	25%	19%
64	27%	24%	25%	23%
65	54%	50%	47%	50%
66	54%	53%	47%	44%
67	54%	39%	47%	38%
68	54%	39%	47%	38%
69	54%	39%	47%	38%
70	54%	39%	47%	38%
71	54%	39%	47%	38%
72	54%	39%	47%	38%
73	54%	39%	47%	38%
74	54%	39%	47%	38%
75	100%	100%	100%	100%
Ref	2634	2635	2636	2637

These rates are based upon data presented in the 2010-2015 experience study and were first used in the 2017 valuation.

Probabilities of Reduced Retirement for Members

Retirement Ages	% of Active Participants Retiring with Reduced Benefits			
	Education		Support	
	Male	Female	Male	Female
50	1.5%	1.0%	0.5%	1.5%
51	1.5%	1.0%	1.0%	1.5%
52	1.5%	1.5%	1.5%	2.0%
53	1.5%	2.0%	2.0%	2.0%
54	2.0%	2.0%	2.5%	2.0%
55	2.5%	2.5%	3.0%	2.0%
56	3.0%	2.5%	3.5%	2.0%
57	5.0%	2.5%	4.5%	2.5%
58	5.0%	2.5%	4.5%	2.5%
59	3.5%	2.5%	4.5%	2.5%
Ref	2640	2638	2641	2639

These are 50% of the rates presented in the 2010-2015 experience study and were first used in the 2017 valuation. These rates anticipate reduced election of early retirement due to the increase in the early retirement reduction from 5% to 10%.

Duration of T-DROP for Members

Present T-DROP members are assumed to remain in T-DROP according to the following table:

Entry Age	Assumed Duration Years
50-56	7
57	6
58	5
59+	4

Teachers
Separations from Active Employment Before Age and Service Retirement and Individual Pay Increases

Sample Ages in 2020	Percent of Active Members Separating within the Next Year						
	Years of Service	Death *		Disability		Other	
		Male	Female	Male	Female	Male	Female
	0					17.80%	12.60%
	1					13.10%	11.10%
	2					12.10%	10.10%
	3					8.60%	8.70%
	4					5.70%	6.50%
25	5 & Up	0.06%	0.02%	0.03%	0.03%	4.50%	5.40%
30		0.06%	0.02%	0.03%	0.03%	3.60%	4.30%
35		0.07%	0.03%	0.03%	0.04%	2.70%	2.90%
40		0.08%	0.05%	0.05%	0.09%	2.00%	2.00%
45		0.12%	0.07%	0.16%	0.19%	1.60%	1.60%
50		0.19%	0.11%	0.40%	0.43%	1.30%	1.40%
55		0.32%	0.18%	0.86%	0.73%	1.10%	1.20%
60		0.55%	0.28%	1.15%	1.00%	0.90%	1.00%
65		0.97%	0.39%	1.15%	1.00%	0.70%	0.80%
Ref:		2633 x 0.94	2634 x 0.84	747 x 1	748 x 1	1029 1381	1030 1382

* *Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the MP-2017 projection scale.*

Age	Pay Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
20	5.00%	2.75%	7.75%
25	2.90%	2.75%	5.65%
30	2.40%	2.75%	5.15%
35	1.90%	2.75%	4.65%
40	1.40%	2.75%	4.15%
45	0.70%	2.75%	3.45%
50	0.30%	2.75%	3.05%
55	0.00%	2.75%	2.75%
60	0.00%	2.75%	2.75%
65	0.00%	2.75%	2.75%
Ref:	472		

Support Employees
Separations From Active Employment Before Age and Service Retirement and Individual Pay Increases

Sample Ages in 2020	Percent of Active Members Separating within the Next Year						
	Years of Service	Death *		Disability		Other	
		Male	Female	Male	Female	Male	Female
	0					49.90%	47.50%
	1					30.10%	28.30%
	2					19.40%	19.10%
	3					15.30%	14.90%
	4					11.80%	12.10%
25	5 & Up	0.06%	0.02%	0.03%	0.02%	9.20%	9.70%
30		0.06%	0.02%	0.09%	0.04%	7.30%	6.90%
35		0.07%	0.03%	0.09%	0.05%	5.60%	5.00%
40		0.08%	0.05%	0.10%	0.07%	4.50%	4.40%
45		0.12%	0.07%	0.22%	0.16%	3.70%	4.00%
50		0.19%	0.11%	0.51%	0.34%	3.30%	3.60%
55		0.32%	0.18%	0.86%	0.59%	3.30%	3.30%
60		0.55%	0.28%	1.11%	0.76%	3.30%	2.80%
65		0.97%	0.39%	1.11%	0.80%	2.80%	2.10%
Ref:		2633 x 0.94	2634 x 0.84	749 x 1	750 x 1	1031 1383	1032 1384

* *Applicable to calendar year 2020. Rates and life expectancies in future years are determined by the MP-2017 projection scale.*

Age	Pay Increase Assumptions for an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
20	5.00%	2.75%	7.75%
25	3.75%	2.75%	6.50%
30	2.60%	2.75%	5.35%
35	2.40%	2.75%	5.15%
40	2.10%	2.75%	4.85%
45	1.00%	2.75%	3.75%
50	0.50%	2.75%	3.25%
55	0.00%	2.75%	2.75%
60	0.00%	2.75%	2.75%
65	0.00%	2.75%	2.75%
Ref:	473		

Miscellaneous and Technical Assumptions
June 30, 2020

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.
Decrement Timing:	Decrements are assumed to occur mid-year, with the exception of normal and early retirement, which are assumed to occur at the beginning of the year. This implies that people who worked the entire school year are reported as active members even if they retired at the end of the year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and the service nearest whole year on the date of the valuation.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability does not operate during the first 5 years of service. Disability and turnover do not operate during retirement eligibility.
Normal Form of Benefit:	The assumed normal form of benefit is the straight life form.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. The payroll used for this purpose is payroll for all active members plus payroll for members in the T-DROP and retirees who returned to work.
Liability Adjustments:	The liability calculations assume that the non-contributory and contributory multipliers for the first ten years of service are at the standard rate at the time the service is earned.
Data Adjustments:	Members whose dates of birth were not supplied were assumed to be 40 years old on the valuation date. Members whose salaries were not supplied and that entered the T-DROP were assumed to have the group average pay of those with salary data as of the valuation that entered the T-DROP.

SECTION H

GLOSSARY

Glossary

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

Accumulated Benefit Obligation. The actuarial present value of vested and non-vested benefits based on service to date and past and current salary levels.

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

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

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

***Actuarial Present Value of Credited Projected Benefits or Pension Benefit Obligation*.** The present value of future benefits based on service to date and the effect projected salary increases.

Actuary. A person who is trained in the applications of probability and compound interest to solve problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation A.S.A. and ultimately to Fellowship with the designation F.S.A. The federal government certifies actuaries to practice under ERISA with the designation of E.A.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Glossary

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

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

Plan Termination Liability. The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

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

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

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