Arkansas Teacher Retirement System

Annual Actuarial Valuation of Annuities Being Paid to Retirees and Beneficiaries

June 30, 2019

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Report of Actuarial Valuation of ATRS Retired Lives

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December 13, 2019

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 annuities being paid to retirees and beneficiaries*** of the Arkansas Teacher Retirement System.

The date of the valuation was June 30, 2019 (using amounts payable as of July 1, 2019).

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.

The 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 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 the 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 the Appendix. These assumptions reflect experience during the period July 1, 2010 to June 30, 2015 and expectations for the future.

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.

This is one of multiple documents comprising the actuarial results. The other documents include the active and inactive valuation dated November 25, 2019, and the presentation dated December 2, 2019.

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 actuaries submitting this report are independent of the plan sponsor.

Respectfully submitted,

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Comments

As expected, during the year ended June 30, 2019 the number of retired lives increased, as did the total amount being paid monthly to retired lives.

The financing diagram on page 7 shows the general pattern in which cash benefits increase (the green line). The schedule below shows how ATRS history illustrates the general pattern.

June 30	Retired Lives Receiving Benefits No.	Annual Rates (millions)	% of Active Payroll#
1967	3,846	$ 6.27	
1972	5,453	11.08	
1977	7,524	23.96	
1982	8,828	36.64	
1987	10,526	66.45	10.0%
1992	12,033	115.50	10.7%
1997	14,233	194.90	15.0%
1998	14,802	220.38	16.1%
1999	15,887	248.75	17.4%
2000	16,657	280.14	18.9%
2001	17,778	309.03	19.8%
2002	19,199	334.15	20.5%
2003	20,271	359.98	21.4%
2004	21,428	386.23	22.1%
2005	22,680	415.04	21.2%
2006	24,153	449.77	21.6%
2007	25,611	484.55	21.1%
2008	26,801	515.56	21.5%
2009	28,818	564.59	22.8%
2010	30,587	612.77	23.1%
2011	32,099	657.08	24.1%
2012	34,160	709.17	26.1%
2013	36,254	763.76	28.0%
2014	38,478	822.19	29.8%
2015	40,748	916.62	33.0%
2016	43,095	983.87	35.3%
2017	45,092	1,044.74	37.1%
2018	46,824	1,099.35	38.3%
2019	48,677	1,146.74	39.4%

 # Doesn't include payroll for retirees who have returned to work.

A significant financial goal for the Teacher Retirement System was to reach a point in time where System assets fully covered the liabilities for future benefit payments to retirees and beneficiaries then on rolls. This goal was achieved in 1980 and retired life liabilities continue to be 100% funded.

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 28 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).
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.

FINANCIAL PRINCIPLES

Annual Reserve Transfers

The annual accounting transfers listed below are recommended so that retired life accounts will be fully funded as of the valuation date.

Reserve Account	June 30, 2019 Balance Reported	Transfer Amount	June 30, 2019 Balance After Transfer
Retiree Accounts			
RRA	$ 11,844,778,384	$ 238,672,146	$ 12,083,450,530
808 RRA	11,497,384	(379,923)	11,117,461
SBA	105,863,197	443,237	106,306,434
Total Retiree Accounts	11,962,138,965	238,735,460	12,200,874,425
EAA	(5,848,501,337)	(238,735,460)	(6,087,236,797)
Total	**$ 6,113,637,628**	**$ -**	**$ 6,113,637,628**

Lump sum death benefits for retirees are paid from the Employer Accumulation Account and are not included in the figures shown in this report. The liabilities for lump sum death benefits for retirees are currently $125.0 million.

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.)

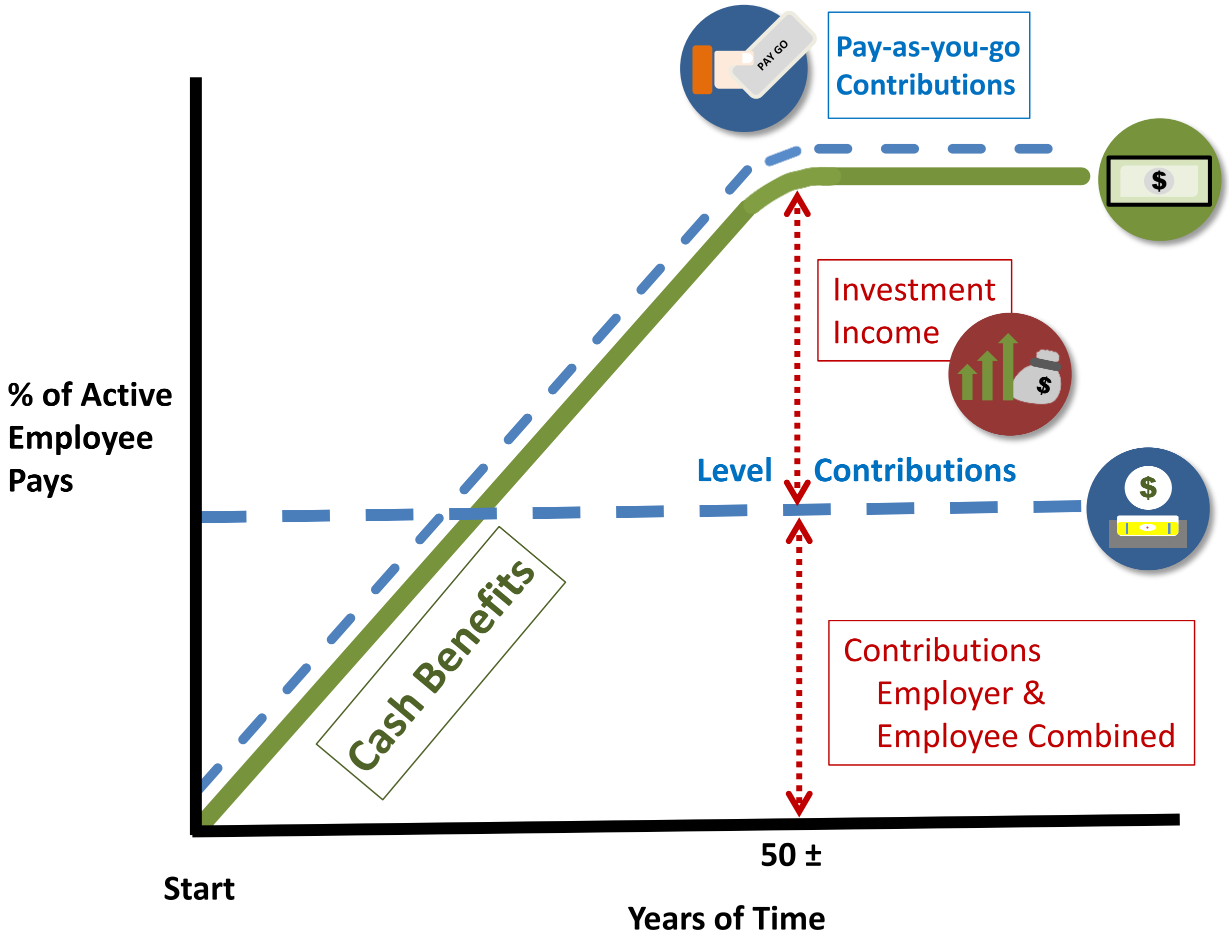
An inevitable byproduct of the level-cost design is the accumulation of reserve assets for decades and the income produced when the assets are invested. ***Investment income*** becomes the ***third and largest contributor*** for benefits to employees, and is interlocked with the contribution amounts 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 assumptions or the skill of the actuary and the precision of the calculations made. The future can be predicted with considerable but not complete precision. ATRS 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.



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

The Actuarial Valuation Process

The financing diagram on the preceding 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 experience 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

Benefit Provisions

Summary of Benefit Provisions
June 30, 2019

1. **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.

2. **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).

3. **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).

4. **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).

Summary of Benefit Provisions
June 30, 2019

5. **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 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.**

6. **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. The interest rate credited will be between 2.5% and 4.0%, increasing 25 basis points for each year on deposit through the 5th year, and then 4% for the 6th and subsequent years.

7. **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 benefits in 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, or if the beneficiary dies prior to 120 months, 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.

Sample Benefit Computations for a Member Retiring July 1, 2019 with a Simple 3% COLA

Data for an example member is shown below.

Annual retirement benefit as of July 1, 2019 (excluding stipend): $30,000

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

	Annual Amount		
Year Ended June 30	**Base**	**Current**	**$ Increase**
2020	$30,000	$30,000	$ 0
2021	30,000	30,900	900
2022	30,000	31,800	900
2023	30,000	32,700	900
2024	30,000	33,600	900

Thereafter, the amount would increase by $900 annually for life. Act 793 members and Act 808 members receive compound COLAs.

CHANGES IN PURCHASING POWER

Benefit Changes During Recent Years of Retirement & 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%

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

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

Benefit Changes During Recent Years of Retirement & 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%

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

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

Benefit Changes During Recent Years of Retirement & 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%

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

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

VALUATION DATA

Summary of
Annuities Being Paid Retirees and Beneficiaries July 1, 2019
by Disbursing Account and Gender

	Men		Women		Totals	
Disbursing Account	**No.**	**Annual Annuities**	**No.**	**Annual Annuities**	**No.**	**Annual Annuities**
Retirement Reserve Account						
Age & Service Annuities						
Retirees	9,906	$263,327,269	33,556	$795,529,733	43,462	$1,058,857,002
Beneficiaries	362	7,423,666	822	18,911,527	1,184	26,335,193
Totals	10,268	270,750,935	34,378	814,441,260	44,646	1,085,192,195
Disability						
Retirees	553	8,180,079	2,239	33,227,288	2,792	41,407,367
Beneficiaries	145	2,188,356	142	2,433,047	287	4,621,403
Totals	698	10,368,435	2,381	35,660,335	3,079	46,028,770
Act 793	87	1,225,633	81	623,596	168	1,849,229
Total retirees and beneficiaries being paid from Retirement Reserve Account	11,053	282,345,003	36,840	850,725,191	47,893	1,133,070,194
Survivor's Benefit Account	362	5,273,304	379	6,040,658	741	11,313,962
Act 808	26	1,692,137	17	663,673	43	2,355,810
Totals	**11,441**	**289,310,444**	**37,236**	**857,429,522**	**48,677**	**1,146,739,966**
Prior Year Totals	11,136	$281,747,789	35,688	$817,600,229	46,824	$1,099,348,018

Summary of
Annuities Being Paid Retirees and Beneficiaries July 1, 2019
by Disbursing Account and Source of Financing

Disbursing Account	Annual Annuities Employee Financed	Annual Annuities Employer Financed	Total No.	Total Annual Annuities
Retirement Reserve Account				
Age & Service Annuities				
Retirees	$ 72,868,878	$ 985,988,124	43,462	$ 1,058,857,002
Beneficiaries	440,898	25,894,295	1,184	26,335,193
Totals	73,309,776	1,011,882,419	44,646	1,085,192,195
Disability				
Retirees	1,908,942	39,498,425	2,792	41,407,367
Beneficiaries	173,717	4,447,686	287	4,621,403
Totals	2,082,659	43,946,111	3,079	46,028,770
Act 793	137,748	1,711,481	168	1,849,229
Total retirees and beneficiaries being paid from Retirement Reserve Account	75,530,183	1,057,540,011	47,893	1,133,070,194
Survivor's Benefit Account	459,768	10,854,194	741	11,313,962
Act 808	100,547	2,255,263	43	2,355,810
Totals	**76,090,498**	**1,070,649,468**	**48,677**	**1,146,739,966**
Prior Year Totals	$ 78,179,125	$ 1,021,168,893	46,824	$ 1,099,348,018

Annuities Being Paid Retirees and Beneficiaries July 1, 2019 by Type of Annuity Being Paid

Type of Annuity	No.	Annual Amounts: Original Annuities	Annual Amounts: Base Annuities	Annual Amounts: Current Annuities
RETIREMENT RESERVE ACCOUNT				
Age & Service				
Option 1 (Basic single life)	34,822	$ 536,527,556	$ 635,952,502	$ 817,888,770
Option A (Joint & 100% Survivor)	5,347	90,885,402	105,199,277	135,091,423
Option B (Joint & 50% Survivor)	2,646	59,630,747	72,029,638	92,575,663
Option C (10-year certain)	647	10,487,013	10,843,078	13,301,146
Beneficiaries	1,184	20,870,802	19,822,864	26,335,193
Totals	44,646	718,401,520	843,847,359	1,085,192,195
Disability				
Option 1	2,325	23,916,629	26,462,857	34,361,609
Option A	366	4,014,482	4,098,562	5,243,781
Option B	82	1,176,934	1,265,843	1,612,749
Option C	19	153,776	142,976	189,228
Beneficiaries	287	3,174,378	3,407,328	4,621,403
Totals	3,079	32,436,199	35,377,566	46,028,770
Act 793	168	$ 942,172	$ 1,849,229	1,849,229
Retirement Reserve Account	47,893	751,779,891	881,074,154	1,133,070,194
Act 808 Retirement Reserve Account	43	818,053	2,355,810	2,355,810
Total Retirement Reserve Account	47,936	752,597,944	883,429,964	1,135,426,004
SURVIVOR'S BENEFIT ACCOUNT				
Beneficiaries of Deceased Members	741	$ 7,821,593	$ 8,879,432	$ 11,313,962
RETIREMENT SYSTEM TOTALS				
Total Annuities Being Paid	48,677	$ 760,419,537	$ 892,309,396	$ 1,146,739,966

The Original Annuity is the annuity at the date of retirement (includes stipend).

The Base Annuity is the amount from which the 3.0% COLA is calculated. Effective July 1, 2018, the stipend is no longer included.

The Current Annuity is the annuity payable at July 1, 2019 including the COLA granted on July 1.

Annuities Being Paid July 1, 2019
from the Retirement Reserve Account to
AGE AND SERVICE Retirees and Beneficiaries
by Attained Ages

Attained Age	No.	Annual Amounts: Original Annuities	Base Annuities	Current Annuities
Under 40	8	$ 169,518	$ 149,393	$ 191,571
40-44	4	34,776	31,063	37,707
45-49	27	423,225	393,648	444,593
50-54	331	8,065,902	7,824,444	8,707,094
55-59	1,377	36,453,729	36,794,068	43,628,545
60-64	6,578	125,180,389	130,785,778	159,160,096
65-69	12,277	211,144,244	230,862,041	290,456,484
70-74	10,861	172,293,123	202,197,890	266,413,259
75-79	6,627	91,157,971	117,332,453	157,843,327
80-84	3,678	44,868,691	64,767,306	87,333,134
85-89	1,887	20,216,900	34,246,068	46,131,825
90-94	775	6,934,556	14,493,354	19,499,480
95 & Up	216	1,458,496	3,969,853	5,345,080
Totals	**44,646**	**$718,401,520**	**$843,847,359**	**$1,085,192,195**

Annuities Being Paid July 1, 2019
from the Retirement Reserve Account to
DISABILITY Retirees and Beneficiaries by Attained Ages

Attained Age	No.	Annual Amounts: Original Annuities	Base Annuities	Current Annuities
Under 40	20	$ 176,907	$ 161,757	$ 200,390
40-44	53	558,818	526,390	611,754
45-49	120	1,253,747	1,173,946	1,359,975
50-54	229	2,997,772	2,842,145	3,346,457
55-59	500	5,395,754	5,116,670	6,289,240
60-64	659	7,091,163	6,885,291	8,820,417
65-69	578	5,770,695	6,048,739	8,221,252
70-74	484	5,140,318	6,156,852	8,402,179
75-79	252	2,589,980	3,602,702	4,901,625
80-84	98	948,419	1,575,698	2,130,675
85-89	56	383,645	860,266	1,165,319
90-94	22	92,530	312,287	423,454
95 & Up	8	36,451	114,823	156,033
Totals	**3,079**	**$32,436,199**	**$35,377,566**	**$46,028,770**

Annuities Being Paid July 1, 2019
from the Retirement Reserve Account to
ACT 793 Retirees and Beneficiaries by Attained Ages

Attained Age	No.	Annual Amounts: Original Annuities	Annual Amounts: Current Annuities
Under 40	-	$ -	$ -
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	-	-	-
60-64	2	4,908	8,137
65-69	23	72,854	116,684
70-74	47	227,334	404,927
75-79	44	295,390	557,029
80-84	28	186,436	378,237
85-89	17	132,577	315,424
90-94	6	17,970	53,953
95 & Up	1	4,703	14,838
Totals	**168**	**$942,172**	**$1,849,229**

Base annuities are equal to current annuities since the COLA is compound.

Annuities Being Paid July 1, 2019
from the Retirement Reserve Account to
SURVIVOR BENEFICIARIES by Attained Ages

Attained Age	Annual Amounts			
	No.	Original Annuities	Base Annuities	Current Annuities
Under 40	184	$1,464,548	$1,448,804	$ 1,651,453
40-44	4	36,965	37,944	45,623
45-49	9	58,568	55,277	69,903
50-54	19	201,123	204,853	252,642
55-59	47	595,044	569,744	682,363
60-64	96	1,515,017	1,525,889	1,903,514
65-69	127	1,373,828	1,453,108	1,879,486
70-74	104	1,331,951	1,514,336	2,015,562
75-79	70	668,667	895,809	1,218,795
80-84	46	372,526	656,004	891,825
85-89	23	170,186	401,925	541,343
90-94	10	28,437	94,177	131,670
95 & Up	2	4,733	21,562	29,783
Totals	**741**	**$7,821,593**	**$8,879,432**	**$11,313,962**

Annuities Being Paid July 1, 2019
from the Act 808 Retirement Reserve Account to
ACT 808 Retirees and Beneficiaries by Attained Ages

Attained Age	No.	Annual Amounts Original Annuities	Current Annuities
Under 40	-	$ -	$ -
40-44	-	-	-
45-49	-	-	-
50-54	-	-	-
55-59	-	-	-
60-64	-	-	-
65-69	-	-	-
70-74	-	-	-
75-79	-	-	-
80-84	10	196,530	597,768
85-89	20	366,188	1,040,386
90-94	10	219,644	605,050
95 & Up	3	35,691	112,606
Totals	**43**	**$818,053**	**$2,355,810**

Base annuities are the same as current annuities since the COLA is compound.

Retiree and Beneficiary Data
as of June 30

Year	Estimated Number Added	Estimated Number Removed	Total Retirees*	Annual Allowances (Millions)	% Increase in Annual Allowances@	Average Annual Allowances
1990	588	337	11,654	$ 92.69	7.0%	$ 7,954
1991	489	253	11,890	104.60	12.8%	8,797
1992	455	312	12,033	115.50	10.4%	9,599
1993	589	316	12,306	129.71	12.3%	10,540
1994	846	512	12,640	141.87	9.4%	11,224
1995	908	342	13,206	156.59	10.4%	11,857
1996	1,107	654	13,659	170.59	8.9%	12,489
1997	1,049	475	14,233	194.90	14.3%	13,694
1998	809	240	14,802	220.38	13.1%	14,888
1999	1,582	497	15,887	248.75	12.9%	15,658
2000	1,249	479	16,657	280.14	12.6%	16,818
2001	1,571	450	17,778	309.03	10.3%	17,383
2002	1,989	568	19,199	334.15	8.1%	17,404
2003	1,621	549	20,271	359.98	7.7%	17,758
2004	1,685	528	21,428	386.23	7.3%	18,025
2005	1,822	570	22,680	415.04	7.5%	18,300
2006	1,958	485	24,153	449.77	8.4%	18,622
2007	2,017	559	25,611	484.55	7.7%	18,920
2008	1,703	513	26,801	515.56	6.4%	19,237
2009	2,721	704	28,818	564.59	9.5%	19,591
2010	2,588	819	30,587	612.77	8.5%	20,034
2011	2,394	882	32,099	657.08	7.2%	20,470
2012	2,932	871	34,160	709.17	7.9%	20,760
2013	3,039	945	36,254	763.76	7.7%	21,067
2014	3,156	932	38,478	822.19	7.7%	21,368
2015	3,326	1,056	40,748	916.62	11.5%	22,495
2016	3,272	925	43,095	983.87	7.3%	22,830
2017	2,996	999	45,092	1,044.74	6.2%	23,169
2018	2,927	1,195	46,824	1,099.35	5.2%	23,478
2019	2,849	996	48,677	1,146.74	4.3%	23,558

* *T-DROP participants are classified as active members for purposes of the valuation and are not included in this schedule.*
@ *T-DROP annuities for retired members included 2015 and later.*

Reported Assets

The assets of the Retirement System, as of June 30, 2019, were reported to your actuary to be $17,741,621,773. This amount, reduced by a funding value adjustment of $329,087,122 this year, is used to finance the Retirement System liability.

Accounts	Assets at June 30 2019	Assets at June 30 2018
Regular Accounts		
Members' Deposit Accounts		
Contributions	$ 1,348,149,014	$ 1,287,855,312
Interest	9,669,786,261	9,645,971,617
Total	11,017,935,275	10,933,826,929
T-DROP Member Deposit Accounts		
Contributions	28,594,336	23,942,761
Interest	26,900,241	27,387,222
Total	55,494,577	51,329,983
Cash Balance Account	133,829,621	109,036,167
Employer's Accumulation Account	(5,848,501,337)	(5,509,753,553)
Retirement Reserve Account	11,844,778,384	11,366,265,784
Act 808 Retirement Reserve Account	11,497,384	12,599,124
T-Lump Payable	411,492,155	417,126,689
Survivors Benefit Account	105,863,197	102,835,207
Total Regular Accounts	17,732,389,256	17,483,266,330
Other Accounts		
Income Expense Account	9,232,517	9,361,410
Other Special Reserves	-	-
Miscellaneous	-	-
Total Other Accounts	9,232,517	9,361,410
Total Market Value of Assets	17,741,621,773	17,492,627,740
Funding Value Adjustment	(329,087,122)	(736,564,812)
Funding Value of Assets	**$17,412,534,651**	**$16,756,062,928**

Valuation Results

Liabilities for Annuities Being Paid July 1, 2019
Tabulated by Type of Annuity Being Paid

Type of Annuity	Liabilities July 1, 2019		
	Men	Women	Totals
RETIREMENT RESERVE ACCOUNT			
Age & Service Annuities			
Option 1 (Straight Life)	$ 1,429,353,924	$ 6,932,439,545	$ 8,361,793,469
Option A (100% Joint & Survivor)	853,640,970	922,770,063	1,776,411,033
Option B (50% Joint & Survivor)	416,536,325	656,173,461	1,072,709,786
Option C (10 Years Certain & Life)	29,232,531	137,380,133	166,612,664
Beneficiaries	59,095,326	165,455,980	224,551,306
Total Age & Service	2,787,859,076	8,814,219,182	11,602,078,258
Disability Annuities			
Option 1	50,134,417	280,225,085	330,359,502
Option A	27,571,540	44,463,076	72,034,616
Option B	5,459,407	12,791,619	18,251,026
Option C	200,950	2,039,728	2,240,678
Beneficiaries	19,613,307	23,826,698	43,440,005
Total Disability	102,979,621	363,346,206	466,325,827
Act 793	9,461,601	5,584,844	15,046,445
Retirement Reserve Account	2,900,300,298	9,183,150,232	12,083,450,530
Act 808 Retirement Reserve Account	8,090,772	3,026,689	11,117,461
Total Retirement Reserve Account	2,908,391,070	9,186,176,921	12,094,567,991
SURVIVORS' BENEFIT ACCOUNT			
Beneficiaries of Deceased Members	$ 48,241,084	$ 58,065,350	$ 106,306,434
RETIREMENT SYSTEM TOTALS			
Total Annuity Liabilities	2,956,632,154	9,244,242,271	12,200,874,425
Cash Benefit Account Liabilities			133,829,621
Liabilities for Lump Sum Death Benefits			125,036,972
Total	$ 2,956,632,154	$ 9,244,242,271	$ 12,459,741,018

Retirement Reserve Account
Comparative Statement of Annuities, Accrued Liabilities and Assets
($ Millions)

Valuation Date June 30	Annual Annuities Being Paid			Average	Computed Liabilities	Applicable Assets	Unfunded Retired Life Liabilities	Ratio of Assets to Liabilities
	No.	Amount	% Incr.					
1980*#	8,001	$ 30.10	3.5%	$ 3,761	$ 280.70	$ 280.7	none	100.0%
1985*+	9,331	51.49	13.6%	5,518	479.9	479.9	none	100.0%
1990	11,054	87.84	7.2%	7,946	847.7	847.7	none	100.0%
1995	12,622	150.45	10.8%	11,920	1,428.6	1,428.6	none	100.0%
2000* ##	16,172	275.65	14.6%	17,045	2,828.8	2,828.8	none	100.0%
2005	22,147	409.42	7.5%	18,486	4,148.1	4,148.1	none	100.0%
2006	23,606	443.98	8.4%	18,808	4,483.4	4,483.4	none	100.0%
2007	25,038	478.30	7.7%	19,103	4,816.4	4,816.4	none	100.0%
2008	26,258	509.29	6.5%	19,396	5,391.3	5,391.3	none	100.0%
2009	28,228	557.83	9.5%	19,762	5,891.9	5,891.9	none	100.0%
2010	29,969	605.55	8.6%	20,206	6,358.0	6,358.0	none	100.0%
2011^	31,498	649.47	7.3%	20,619	6,972.6	6,972.6	none	100.0%
2012	33,533	701.09	7.9%	20,907	7,481.0	7,481.0	none	100.0%
2013	35,622	755.26	7.7%	21,202	8,004.8	8,004.8	none	100.0%
2014	37,824	813.33	7.7%	21,503	8,561.9	8,561.9	none	100.0%
2015	40,070	907.09	11.5%@	22,638	9,515.7	9,515.7	none	100.0%
2016	42,395	973.78	7.4%	22,969	10,157.2	10,157.2	none	100.0%
2017* ^	44,394	1,034.17	6.2%	23,295	11,026.4	11,026.4	none	100.0%
2018	46,108	1,088.30	5.2%	23,603	11,515.7	11,515.7	none	100.0%
2019	47,979	1,137.79	4.5%	23,714	12,094.6	12,094.6	none	100.0%

* *After plan amendments.*
\# *After change in interest assumption from 6.0% to 7.0%, change in post-retirement adjustments from 1.5% to 3.0% and recommended reserve transfer.*
\+ *After redetermination of base, retroactive application of new minimum benefit formula and reserve transfers.*
\## *Includes Act 808 and Act 793 retirees beginning in 2000.*
^ *After changes in assumptions.*
@ *T-DROP annuities for retired members included 2015 and later.*

Survivors' Benefit Account
Accrued Liabilities and Assets
Comparative Statement

Valuation Date June 30	Annual Annuities Being Paid		Computed Liabilities	Applicable Assets	Unfunded Accrued Liabilities	Ratio of Assets to Liabilities
	No.	Amount				
1980*#	393	$ 772,631	$ 7,042,644	$ 7,042,644	none	100.0%
1985*+	421	1,240,399	12,411,800	12,411,800	none	100.0%
1990	424	1,830,743	18,117,244	18,117,244	none	100.0%
1995	416	2,723,940	26,220,218	26,220,218	none	100.0%
2000*	485	4,487,519	43,701,138	43,701,138	none	100.0%
2005	533	5,619,675	56,257,745	56,257,745	none	100.0%
2006	547	5,791,974	57,605,939	57,605,939	none	100.0%
2007	573	6,250,603	63,481,565	63,481,565	none	100.0%
2008	543	6,269,551	66,496,539	66,496,539	none	100.0%
2009	590	6,761,034	70,857,161	70,857,161	none	100.0%
2010	618	7,224,585	75,108,334	75,108,334	none	100.0%
2011^	601	7,605,212	81,150,385	81,150,385	none	100.0%
2012	627	8,081,913	84,930,745	84,930,745	none	100.0%
2013	632	8,491,667	88,139,802	88,139,802	none	100.0%
2014	654	8,861,734	89,793,996	89,793,996	none	100.0%
2015	678	9,530,889	95,272,795	95,272,795	none	100.0%
2016	700	10,084,359	98,960,258	98,960,258	none	100.0%
2017* ^	698	10,574,602	104,668,995	104,668,995	none	100.0%
2018	716	11,042,074	107,043,067	107,043,067	none	100.0%
2019	741	11,313,962	106,306,434	106,306,434	none	100.0%

* *Includes plan amendments.*

\# *After change in interest assumption from 6.0% to 7.0%, change in post-retirement adjustments from 1.5% to 3.0% and recommended reserve transfer.*

\+ *After redetermination of base annuity, retroactive application of new minimum benefit formula and recommended reserve transfer.*

^ *After changes in assumptions.*

Annual Allowances of Retired Lives by Year of Retirement as of June 30, 2019

Calendar Year of Retirement	No.	Annual Amount Being Paid Original	Total Increase	Current	Average
2019*	662	$ 7,479,646	$ 461,133	$ 7,940,779	$11,995
2018	2,816	46,495,516	6,545,110	53,040,626	18,835
2017	2,818	46,014,184	8,956,007	54,970,191	19,507
2016	2,885	46,763,425	10,680,564	57,443,989	19,911
2015	3,093	50,288,803	13,329,762	63,618,565	20,569
2014	3,044	50,839,263	15,013,191	65,852,454	21,634
2013	2,783	46,559,285	15,892,841	62,452,126	22,441
2012	2,739	44,092,646	16,692,102	60,784,748	22,192
2011	2,458	39,959,667	16,201,454	56,161,121	22,848
2010	2,111	34,081,242	15,984,765	50,066,007	23,717
2009	2,181	35,821,422	18,074,280	53,895,702	24,711
2008	2,097	32,831,271	16,570,884	49,402,155	23,558
2007	1,949	30,193,930	15,572,906	45,766,836	23,482
2006	1,735	27,341,337	15,681,312	43,022,649	24,797
2005	1,721	27,403,776	17,704,054	45,107,830	26,210
2004	1,509	22,906,000	14,551,314	37,457,314	24,823
2003	1,371	20,510,695	13,704,615	34,215,310	24,956
2002	1,306	20,229,889	13,864,350	34,094,239	26,106
2001	1,329	18,443,343	12,971,203	31,414,546	23,638
2000	1,131	17,743,691	13,666,941	31,410,632	27,772
1999	977	14,117,152	12,163,402	26,280,554	26,899
1998	946	12,809,770	11,669,660	24,479,430	25,877
1997	710	10,945,747	11,046,585	21,992,332	30,975
1996	567	9,063,774	9,263,521	18,327,295	32,323
1995	609	9,803,278	10,375,949	20,179,227	33,135
1994	621	9,782,156	11,480,626	21,262,782	34,240
1993	450	7,243,381	8,949,705	16,193,086	35,985
1992	307	3,888,183	5,530,043	9,418,226	30,678
1991	225	2,549,968	3,913,353	6,463,321	28,726
1990	251	2,653,086	4,633,434	7,286,520	29,030
1989	242	2,601,138	4,765,629	7,366,767	30,441
1988	233	2,500,855	4,887,291	7,388,146	31,709
1987	227	2,342,398	5,102,404	7,444,802	32,796
1986	135	1,287,899	2,847,527	4,135,426	30,633
1985	107	961,648	2,120,533	3,082,181	28,805
Before 1984	332	1,870,073	5,451,979	7,322,052	22,054
TOTAL	**48,677**	**$760,419,537**	**$386,320,429**	**$1,146,739,966**	**$23,558**

* *Reporting for calendar year 2019 is not yet complete. The July 1st retirees are not included in the schedule.*

APPENDIX

APPENDIX

Single Life Retirement Values
Based on RP-2014 Mortality Headcount Weighted Tables
Adjusted Using MP-2017 Projection Scale & 7.5% Interest

Sample Attained Ages in 2019*	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	
	Men	Women	Men	Women	Men	Women	Men	Women
40	$150.78	$154.22	$198.67	$205.14	42.65	46.91	0.33 %	0.28 %
45	146.82	151.45	191.26	199.48	37.86	42.10	0.41 %	0.32 %
50	141.65	147.57	181.99	192.01	33.15	37.29	0.53 %	0.36 %
55	135.01	142.16	170.65	182.24	28.57	32.49	0.71 %	0.44 %
60	126.70	135.10	157.13	170.16	24.16	27.81	0.98 %	0.60 %
65	116.61	126.06	141.50	155.51	20.00	23.29	1.36 %	0.82 %
70	104.37	114.48	123.61	137.92	16.08	18.95	1.97 %	1.24 %
75	89.86	100.41	103.61	117.82	12.46	14.88	3.07 %	2.05 %
80	73.73	84.39	82.70	96.30	9.24	11.25	5.10 %	3.48 %
85	57.47	67.50	62.75	74.91	6.57	8.15	8.75 %	6.12 %
Base	2635 x 1.01	2636 x 0.91	2635 x 1.01	2636 x 0.91				
Projection	939	940 x 0.91	939	940				

* *Applicable to calendar year 2019. Rates and life expectancies in future years are determined by the MP-2017 projection scale.*

Sample Attained Ages in 2019	Benefit Increasing 3.0% Yearly	Portion of Age 60 Lives Still Alive	
		Men	Women
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

GRS Retirement Consulting
800.521.0498 | P: 248.799.9000 | F: 248.799.9020 | www.grsconsulting.com

December 13, 2019

Mr. Clint Rhoden
Executive Director
Arkansas Teacher Retirement System
1400 West Third Street
Little Rock, Arkansas 72201

Re: Report of June 30, 2019 Actuarial Valuation of Retirees and Beneficiaries

Dear Mr. Rhoden:

Enclosed are 15 copies of this report. Please let us know if anything else is needed.

Sincerely,

Judith A. Kermans

Judith A. Kermans, EA, FCA, MAAA

JAK:ah
Enclosures

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723