

ARKANSAS STATE POLICE RETIREMENT SYSTEM
ANNUAL ACTUARIAL VALUATION AND THE
GAIN/LOSS ANALYSIS OF EXPERIENCE
JUNE 30, 2016

**REPORT OF THE
ANNUAL ACTUARIAL VALUATION AND GAIN/LOSS ANALYSIS
OF THE
ARKANSAS STATE POLICE RETIREMENT SYSTEM
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November 11, 2016

Board of Trustees
Arkansas State Police Retirement System
Little Rock, Arkansas

Ladies and Gentlemen:

The results of the *Annual Actuarial Valuation of the Arkansas State Police Retirement System as of June 30, 2016, and the Gain/Loss Analysis of Experience among Active Members from July 1, 2015 to June 30, 2016* are presented in this report. The valuation was based upon Retirement System provisions in effect on the valuation date. The purpose of the valuation and gain/loss analysis is to measure funding progress in relation to the actuarial cost method and to determine the employer contribution rates for the fiscal year beginning July 1, 2016. The results of the valuation may not be applicable for other purposes. A separate report will be issued to provide actuarial information for GASB Statements No. 67 and No. 68.

This report should not be relied on for any purpose other than those described above. It 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 System only in its entirety and only with the permission of the Board. Gabriel, Roeder, Smith & Company is not responsible for unauthorized use of this report.

The signing individuals are independent of the plan sponsor.

The findings in this report are based on data and other information through June 30, 2016. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

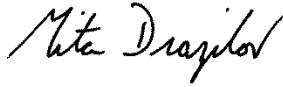
The actuarial methods and assumptions used in the valuation are summarized in Section D of this report. The assumptions are established by the Retirement Board after consulting with the actuary. The actuarial assumptions used for the valuation produce results which, individually and in the aggregate, are reasonable.

The cooperation of the administrative staff in furnishing the materials required for this valuation is hereby acknowledged with appreciation.

This report has been prepared by individuals who have substantial experience valuing public employee retirement systems. 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 and in conformance with Title 24 of the Arkansas Code.

Mita D. Drazilov 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.

Respectfully submitted,



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OBJECTIVES AND STATUS

General Financial Objective. Section 24-2-701 of the Arkansas Code provides as follows:

“6.01. (a) The general financial objective of each Arkansas public employee retirement plan shall be to ***establish and receive contributions which, expressed as percents of active member payroll, will remain approximately level from generation to generation of Arkansas citizens.*** More specifically, contributions received each year shall be sufficient both (i) to fully cover the costs of benefit commitments being made to members for their service being rendered in such year and (ii) to make a level payment which if paid annually over a reasonable period of future years will fully cover the unfunded costs of benefit commitments for service previously rendered.....”

Benefit Changes. The most recent benefit changes were reflected in the June 30, 2009 valuation. No benefit changes have been adopted for consideration in the June 30, 2016 valuation.

Assumption Changes. The economic assumptions were last updated for the June 30, 2015 valuation.

Method Changes. The actuarial cost method and amortization method were last updated for the June 30, 2013 valuation in conjunction with the completed experience study.

ASPRS Status. Based upon the results of the June 30, 2016 actuarial valuation, ***ASPRS continues to satisfy the general financial objective*** of level contribution financing.

ASPRS Reserve Strength. As a by-product of achieving level contribution financing, actuarial accrued liabilities usually become more and more funded over a period of years. **The funded ratio of ASPRS** has been adversely affected by the market downturn in late 2008 and early 2009 (as has virtually all other public employee retirement systems in the country). On a funding value of assets basis, the System has a 71% funded ratio. On a market value of assets basis, the System has a 67% funded ratio.

Employer Contribution Rates. Based upon experience through June 30, 2016, the State Police contribution rate will be 48.57% of covered payroll for the fiscal year beginning July 1, 2016.

OTHER OBSERVATIONS

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

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

- 1) The total employer contribution rate as a percentage of pay will decrease to the level of the Tier 2 normal cost as time passes and Tier 1 members terminate employment and are replaced.
- 2) The unfunded actuarial accrued liabilities will be fully amortized after 23 years, and
- 3) The funded status of the plan will increase gradually towards a 100% funded ratio.

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.
- 2) The measurement is dependent upon the actuarial cost method which, in combination with the amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. 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.

SECTION A
VALUATION RESULTS

**COMPUTED ACTUARIAL ACCRUED LIABILITIES
AS OF JUNE 30, 2016**

Actuarial Present Value of	(1) Total Present Value	(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1) - (2)
Future benefits to be paid to current retirees, beneficiaries, future beneficiaries of current retirees, and current DROP members (not including DROP reserve)	\$309,109,290	\$ 3,073,590	\$306,035,700
Age and service benefits based on service likely to be rendered by present active members (including DROP reserve)	136,750,771	42,170,260	94,580,511
Separation benefits likely to be paid present active and inactive members	9,929,520	5,780,093	4,149,427
Disability benefits likely to be paid present active members	7,425,352	4,521,606	2,903,746
Death-in-service benefits likely to be paid on behalf of present active members	1,771,183	701,607	1,069,576
Total	\$464,986,116	\$56,247,156	\$408,738,960
Valuation assets			<u>289,236,857</u>
Unfunded actuarial accrued liabilities			\$119,502,103

**AMORTIZATION OF
UNFUNDED ACTUARIAL ACCRUED LIABILITIES (UAAL)
JUNE 30, 2016**

Description	Remaining Years	Amount
Active Member UAAL		
Act 1071 of 1997#	23	\$ 97,183,217
Remainder - Tier One	23	19,926,241
- Tier Two	23	2,392,645
Total Active		119,502,103
Total UAAL		\$119,502,103

See page G-1.

**COMPUTED EMPLOYER CONTRIBUTION RATES
AS OF JUNE 30, 2016
EXPRESSED AS PERCENTS OF ACTIVE MEMBER PAYROLL**

Contributions for	Contributions Expressed as Percents of Covered Payroll*		Weighted Average
	Tier 1	Tier 2	
Normal Cost			
Age and Service Annuities	16.67 %	16.27 %	16.34 %
Separation Benefits	2.07 %	2.08 %	2.07 %
Disability Benefits	1.55 %	1.71 %	1.68 %
Death-in-Service Annuities	0.31 %	0.26 %	0.27 %
Administrative Expenses	0.70 %	0.70 %	0.70 %
Total	21.30 %	21.02 %	21.06 %
Unfunded Actuarial Accrued Liabilities@	92.06 %	0.78 %	27.51 %
Total Computed Employer Contribution Rate	113.36 %	21.80 %	48.57 %

* Covered payroll includes all active members, including DROP participants. Valuation payroll totals \$29,448,593.

@ Unfunded actuarial accrued liabilities were amortized over a closed 23 year period.

COMPUTED EMPLOYER CONTRIBUTION RATES COMPARATIVE STATEMENT

June 30	Active Members in Valuation		Change in Average Pay %	Change in CPI: Inflation	UAAL Financing Period	Computed Employer Rate &
	Number	Average Pay \$				
2007@	536	\$ 44,773	0.9 %	2.4 %	30	37.86%
2008	555	46,687	4.3 %	5.6 %	30	38.20%
2009@	539	49,714	6.5 %	(2.1)%	30	44.71%
2010	545	52,318	5.2 %	1.2 %	30	44.67%
2011	530	52,950	1.2 %	3.6 %	30	47.64%
2012	534	53,236	0.5 %	1.4 %	30	48.28%
2013@	525	53,344	0.2 %	2.0 %	26	47.93%
2014@	530	53,866	1.0 %	2.0 %	25	47.35%
2015@	558	53,637	(0.4)%	0.2 %	24	48.51%
2016	554	53,156	(0.9)%	0.8 %	23	48.57%
10-Year Average			1.8 %	1.7 %		

After legislated changes in benefit provisions.

& Beginning in 1996, rate is based on active member payroll including DROP participants.

@ After changes in actuarial assumptions and/or methods.

“Employer contributions” are the total of all types of revenue to the System except employee contributions by payroll deduction and investment return. “Employer contributions” include such revenues as court fines and other transfers.

SHORT CONDITION TEST – 10-YEAR COMPARATIVE STATEMENT

The Arkansas SPRS 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 valuation assets (cash and investments) are compared with:

- 1) Member accumulated contributions;
- 2) The liabilities for future benefits to present retired lives;
- 3) The employer financed portion of liabilities for service already rendered by non-retired members.

In a System that has been following the discipline of level percent-of-payroll financing, active member contributions (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by valuation assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will be partially covered by the remainder of valuation assets. The larger the funded portion of liability 3, the stronger the condition of the System.

Valuation Date June 30	Entry Age Accrued Liability			Valuation Assets	Portion of Present Values Covered By Valuation Assets			
	(1) Active Members Contr.	(2) Retirees and Benef.	(3) Active Member (Employer Financed Portion)		(1)	(2)	(3)	Total
	(\$ in Millions)							
2006	\$0.47	\$143.63	\$147.07	\$210.34	100%	100%	45%	72%
2007@	0.51	158.34	148.81	233.13	100%	100%	50%	76%
2008	0.44	167.93	151.73	238.04	100%	100%	46%	74%
2009#@	0.45	169.43	156.06	206.32	100%	100%	23%	63%
2010	0.35	179.38	153.87	211.07	100%	100%	20%	63%
2011	0.28	205.40	137.53	208.05	100%	100%	2%	61%
2012	0.31	217.64	137.35	215.01	100%	99%	0%	61%
2013@	0.53	227.80	133.13	233.15	100%	100%	4%	65%
2014@	0.50	237.17	144.19	259.46	100%	100%	15%	68%
2015*	0.37	252.79	145.80	274.83	100%	100%	15%	69%
2016	0.57	260.49	147.68	289.24	100%	100%	19%	71%

After legislated changes in benefit provisions.

@ After changes in actuarial assumptions and/or methods.

* (1) was estimated based on reported member contribution balances on data received by the actuary from ASPRS.

COMMENTS

Experience

The System recognized a small actuarial gain this year. On a funding value of assets basis, the funded status increased to 71% (see page A-5). On a market value of assets basis, the funded status is 67% (down from 70% last year). As of June 30, 2016, unrecognized cumulative investment losses totaling \$16.3 million remain to be recognized in the next three years (see page B-14). If there are no new gains to offset scheduled investment recognition during this coming period and based upon a 23-year amortization period, the employer contribution rate would be expected to increase by approximately 3.8% of payroll from the current level.

Annual Reserve Transfers

Each year reserve transfers are recommended so that there will be 100% funding in the Retirement Reserve Account and the Deferred Annuity Account. The Retirement Reserve Account is responsible for future annuity payments to present retired lives. The Deferred Annuity Account is responsible for future annuity payments to present inactive members.

This year's transfer amounts are given below:

	Employer Accum. Account Before Transfers	Transfers as of July 1, 2016 (from) to:		Employer Accum. Account After Transfers
		Deferred Annuity Account	Retirement Reserve Account	
Tier 1	\$(42,232,254)	\$ (40,739)	\$7,046,115	\$(49,237,630)
Tier 2	51,144,826	166,151	654,618	50,324,057
Total	\$ 8,912,572	\$125,412	\$7,700,733	\$ 1,086,427

Conclusion

The computed employer contribution rate to satisfy the statutory funding requirements set forth in Section 24-6-209 of the Arkansas Code (see page G-1) is 48.57% of covered payroll for the year beginning July 1, 2016.

SECTION B
VALUATION DATA

SUMMARY OF NON-CONTRIBUTORY BENEFIT PROVISIONS (LAST CHANGED AS OF 7-1-2009)

The Non-Contributory Plan was created by Act 793 of 1977 and was effective January 1, 1978. All non-retired members are now covered by non-contributory benefits. Act 1071 of 1997 created a Tier Two benefit plan for all officers hired on or after April 3, 1997. Existing members of the plan in effect prior to this date (Tier One) had one year to elect coverage under Tier Two.

VOLUNTARY RETIREMENT

With a full benefit, after 30 years of actual service, regardless of age, or at age 65 with 5 actual years of service for Tier One and Tier Two. The age requirement is reduced by 1 month for every 2 months of Public Safety service credit, but not below age 52 for Tier One or age 55 for Tier Two members.

Public Safety service credit is granted at the rate of 1.5 months of credit for each month of actual Public Safety employment for Tier One. Service is credited at a rate of one for one in Tier Two.

With a reduced benefit, once a member's age is within 10 years of becoming eligible for full benefits. The reduction for Tier One is equal to 1/2 of 1% for each month retirement precedes Normal Retirement Age. The reduction for Tier Two is equal to 3/4 of 1% for each month retirement precedes Normal Retirement Age.

FINAL AVERAGE PAY (FAP)

Average of the highest 60 calendar months' pays for Tier One or 48 calendar months for Tier Two.

FULL AGE & SERVICE RETIREMENT BENEFIT

Tier One: 1.55% of FAP times years and months of credited service. Tier Two: 2.475% of FAP times credited service. If retirement is prior to age 62, an additional .322% of FAP times credited service will be paid until the retiree attains age 62 for Tier One or .513% of FAP times credited service for Tier Two.

Public Safety service credit is granted at the rate of 1.5 months of credit for each month of actual Public Safety employment for Tier One. Service is credited at a rate of one for one in Tier Two.

For Tier One, the portion of the SPRS benefit based on service before 1978 cannot be less than the amount provided by contributory provisions in effect at time of retirement; and if there is credited service for time prior to July 1, 1991, the benefit cannot be less than under the provisions in effect July 1, 1990, (using Social Security offset), plus increases granted since that date.

For Tier One, the minimum monthly benefit is \$150 minus any age and beneficiary option reductions.

VESTED AND REDUCED EARLY RETIREMENT BENEFITS

5 years of actual service, and leaving System-covered employment before full retirement age.

Deferred full retirement benefit, based on service and pay at termination, begins when full retirement age would have been reached by continuing covered employment.

In place of a deferred full benefit, a qualifying member may elect an immediate reduced benefit, provided the member is within 10 years of full retirement age. The reduced amount is the full amount reduced by 1/2 of 1% for Tier One and/or 3/4 of 1% for Tier Two for each month of difference in benefit commencement ages.

DEATH WHILE IN SYSTEM COVERED EMPLOYMENT

Member's accumulated contributions before 1978 are refundable.

If the deceased member has 5 or more years of service and has qualifying dependents, monthly benefits are payable instead. A surviving spouse receives a benefit as if the member had retired and elected the joint & 75% survivor option. Payment begins immediately if the member was eligible for a full age and service benefit or had 20 years of service; or payment begins at the spouse's age 50 if the member had 15 or more years of service; or payment begins at the spouse's age 62 if the member had less than 15 years of service.

If a member is killed while in the official line of duty and the surviving spouse is eligible for a deferred benefit, then the surviving spouse may elect to receive a reduced benefit immediately. The reduction of the benefit shall be 1/2 of 1% per month for each of the first 60 months that the benefit commences before when it would have otherwise commenced, plus; 1/4 of 1% per month for each month more than 60 months that the benefit commences before when it would have otherwise commenced. However, the total reduction shall not be more than 50%.

Each dependent child receives a benefit of 10% of annual pay (maximum of 25% of annual pay for all children).

Dependent parents' benefits are payable if neither spouse nor children's benefits are payable.

TOTAL AND PERMANENT DISABILITY

Tier One eligibility: Disabled after 5 years of service.

Tier Two eligibility: Disabled after 5 years of service.

Amount is computed as an age and service benefit, based on service and pay to the time of disability.

DEATH AFTER RETIREMENT

Retiring member can provide protection for a beneficiary by electing an option which provides beneficiary protection by reducing the retired employee's benefit amount.

Under Tier One, if a straight life annuity is paid, upon the retiree's death, 50% of the retiree's benefit is continued to a surviving spouse. If the deceased retiree leaves children under age 18, 75% of the retiree's benefit is continued to the surviving spouse. If there is no surviving spouse, the 75% will be divided among the children under age 18.

Under Tier Two, if a straight life annuity is elected, no survivor benefit is payable.

BENEFIT INCREASES AFTER RETIREMENT

Annually, there is a cost-of-living adjustment equal to 3% of the current benefit amount.

MEMBER CONTRIBUTIONS

None.

ARKANSAS STATE POLICE OFFICERS DEFERRED RETIREMENT OPTION PLAN – TIER I
(Act 967 of 1995)

Tier One members with 30 years of credited service and who are eligible to receive a service retirement pension may participate.

Participating members may continue in employment for up to 7 years and have their accrued monthly benefit (at date of participation) credited to an individual account in the Deferred Retirement Option Plan in lieu of any further benefit accruals.

The Deferred Retirement Option Plan accounts accumulate with interest and are paid to the member at termination of active membership in either a lump sum or as an annuity of equivalent value. Interest is credited annually at a rate established by the Board of Trustees.

ARKANSAS STATE POLICE OFFICERS DEFERRED RETIREMENT OPTION PLAN – TIER II
(Act 1242 of 2009)

Tier Two members with at least 30 years of actual service and are eligible to receive a service retirement pension may participate.

Participating members may continue in employment for up to 7 years and have seventy-two percent (72%) of their accrued monthly benefit (at date of participation) credited to an individual account in the Deferred Retirement Option Plan in lieu of any further benefit accruals.

The Deferred Retirement Option Plan accounts accumulate with interest and are paid to the member at termination of active membership in either a lump sum or as an annuity of equivalent value. Interest is credited annually to participant accounts at a rate established by the Arkansas State Police Retirement System Board of Trustees that shall not be greater than five percent (5%) nor less than one percent (1%) per annum.

RETIREES, BENEFICIARIES AND DROP PARTICIPANTS
JUNE 30, 2016
BY TYPE OF BENEFIT BEING PAID

Type of Benefit Being Paid	Number	Annual Pensions	Actuarial Accrued Liability
Age & Service Retirees			
Life	92	\$ 3,066,588	\$ 30,041,297
B-50	331	15,402,133	183,280,760
B-75	14	336,598	4,198,009
Totals	437	18,805,319	217,520,066
Beneficiaries of Age & Service Retirees			
Life	9	130,326	1,522,219
B-50	103	2,200,352	21,582,707
B-75	2	25,008	338,657
Totals	114	2,355,686	23,443,583
Total Age & Service Retirees	551	21,161,005	240,963,649
Disability Retirees			
Life	18	334,416	3,731,883
B-50	23	726,312	8,220,047
B-75	1	4,044	71,005
Totals	42	1,064,772	12,022,935
Beneficiaries of Disability Retirees	2	14,364	168,544
Total Disability Retirees and Beneficiaries	44	1,079,136	12,191,479
Death-in-Service Beneficiaries	5	79,188	752,234
QDRO Alternate Payees	34	532,792	6,585,408
Total Retirees and Beneficiaries	634	22,852,121	260,492,770
DROP Participants (excluding DROP reserve)	58	3,434,940	45,542,930
Total Retirees, Beneficiaries and DROP Participants	692	\$ 26,287,061	\$ 306,035,700

Also included in the valuation were 76 inactive members eligible to receive vested deferred benefits, commencing at normal retirement age, totaling \$810,251 annually.

**RETIREES, BENEFICIARIES AND DROP PARTICIPANTS
BY ATTAINED AGES
AS OF JUNE 30, 2016**

Attained Ages	Age and Service		Disabilities		Death in Service		DROP Participants	
	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions
Under 40	2	\$ 10,516	2	\$ 20,808				
40-44	1	10,128	1	9,084				
45-49	6	80,456	9	169,620			1	\$ 53,412
50-54	23	792,088	6	125,436			25	1,381,140
55-59	60	2,066,859	3	78,924			31	1,912,356
60-64	124	4,777,750	8	225,108			1	88,032
65-69	137	4,883,628	8	257,832	2	\$26,352		
70-74	116	4,798,776	5	150,708	1	14,328		
75-79	52	2,111,508	1	35,124	1	26,148		
80-84	41	1,411,164	1	6,492	1	12,360		
85-89	17	546,372						
Over 90	6	204,552						
Totals	585	\$21,693,797	44	\$1,079,136	5	\$79,188	58	\$3,434,940

**RETIREES, BENEFICIARIES AND DROP PARTICIPANTS
IN ACTUARIAL VALUATIONS
COMPARATIVE STATEMENT**

June 30	Number			Annual Pensions		
	Retirees & Beneficiaries	DROP Participants	Total	Retirees & Beneficiaries	DROP Participants	Total
2007	428	80	508	\$ 13,275,239	\$ 3,926,772	\$ 17,202,011
2008	445	82	527	14,201,027	4,029,012	18,230,039
2009	455	95	550	14,833,696	4,706,004	19,539,700
2010	476	85	561	15,796,711	4,246,608	20,043,319
2011	554	76	630	17,982,593	3,806,412	21,789,005
2012	580	63	643	19,322,269	3,290,952	22,613,221
2013	598	61	659	20,346,612	3,273,420	23,620,032
2014	607	59	666	20,941,640	3,290,208	24,231,848
2015	622	56	678	21,868,359	3,126,156	24,994,515
2016	634	58	692	22,852,121	3,434,940	26,287,061

**SCHEDULE OF AVERAGE BENEFIT PAYMENTS
(VOLUNTARY RETIREMENTS STILL RECEIVING
BENEFITS AS OF JUNE 30, 2016)**

	Years Credited Service				
	10-14	15-19	20-24	25-29	30+
Retirement Effective Dates July 1, 2015 to June 30, 2016					
Average Monthly Benefit	\$ 484.00	\$ 881.00			\$ 4,159.91
Average Monthly FAS	2,675.17	2,550.17			5,221.25
Number of Active Retirees	1	1			1
Retirement Effective Dates July 1, 2014 to June 30, 2015					
Average Monthly Benefit		2,293.00	\$ 1,999.00	\$4,812.50	3,799.17
Average Monthly FAS		3,998.92	4,058.42	4,431.50	4,917.85
Number of Active Retirees		1	1	2	6
Retirement Effective Dates July 1, 2013 to June 30, 2014					
Average Monthly Benefit	327.00	\$ 1,411.00		2,558.00	3,007.50
Average Monthly FAS	1,485.64	4,149.00		4,075.67	4,598.73
Number of Active Retirees	3	1		1	4
Retirement Effective Dates July 1, 2012 to June 30, 2013					
Average Monthly Benefit	1,156.00			1,496.17	4,213.75
Average Monthly FAS	1,437.83			4,500.17	5,418.08
Number of Active Retirees	1			1	4
Retirement Effective Dates July 1, 2011 to June 30, 2012					
Average Monthly Benefit	129.00			3,307.00	2,492.14
Average Monthly FAS	266.33			5,047.58	4,784.19
Number of Active Retirees	1			2	7
Retirement Effective Dates July 1, 2011 to June 30, 2016					
Average Monthly Benefit	458.33	1,528.33	1,999.00	3,382.19	3,331.13
Average Monthly FAS	1,472.71	3,566.03	4,058.42	4,589.00	4,922.04
Number of Active Retirees	6	3	1	6	22

**SCHEDULE OF NEW RETIREES AND DROP PARTICIPANTS
DURING THE PERIOD OF JULY 1, 2015 TO JUNE 30, 2016***

RETIREES AND DROP PARTICIPANTS

	Age & Service	Disability
Number	22	1
Average Age	52.91	46.00
Average Credited Service	34.36	10.00
Average Monthly Benefit	\$ 4,561.32	\$ 1,330.00

RETIREES ONLY

	Age & Service	Disability
Number	3	1
Average Age	53.33	46.00
Average Credited Service	20.00	10.00
Average Monthly Benefit	\$ 1,841.64	\$ 1,330.00

** From either active or inactive status the prior year.*

**ACTIVE MEMBERS
AS OF JUNE 30, 2016
BY ATTAINED AGE AND YEARS OF SERVICE**

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
20-24	13							13	\$ 432,447
25-29	61	7						68	2,458,497
30-34	46	33	10					89	3,998,215
35-39	23	26	22	5				76	3,711,417
40-44	7	12	18	34	3			74	4,207,880
45-49	3	19	14	49	22	2		109	6,457,602
50-54	1	6	3	18	21	9		58	3,659,985
55-59		2	2		2	1		7	437,657
60	1							1	125,331
66			1					1	59,562
Base Totals	155	105	70	106	48	12		496	\$25,548,593
DROP									
Participants *							58	58	3,900,000
Grand Totals	155	105	70	106	48	12	58	554	\$29,448,593

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

<u>Average</u>	
Age:	40.9 years
Service:	13.1 years
Salary:	\$53,156

* \$67,241 was used as an estimate of average annual pay for DROP participants.

**ACTIVE MEMBERS
IN ACTUARIAL VALUATIONS
COMPARATIVE STATEMENT**

June 30	No. #	Group Averages		
		Age	Service	Pay
1995	494	42.2 yrs.	16.0 yrs.	\$36,622
2000	542	41.3	14.0	37,733
2001	558	41.5	14.0	36,125
2002	510	41.5	14.1	38,584
2003	495	42.0	14.5	39,730
2004	477	42.2	16.2	44,700
2005	488	42.8	16.7	44,539
2006	527	41.3	14.5	44,358
2007	536	41.4	14.5	44,773
2008	555	41.3	14.1	46,687
2009	539	42.0	15.0	49,714
2010	545	42.0	14.3	52,318
2011	530	42.0	14.4	52,950
2012	534	41.6	13.9	53,236
2013	525	41.6	13.9	53,344
2014	530	41.6	13.9	53,866
2015	558	41.0	13.0	53,637
2016	554	40.9	13.1	53,156

Includes DROP participants.

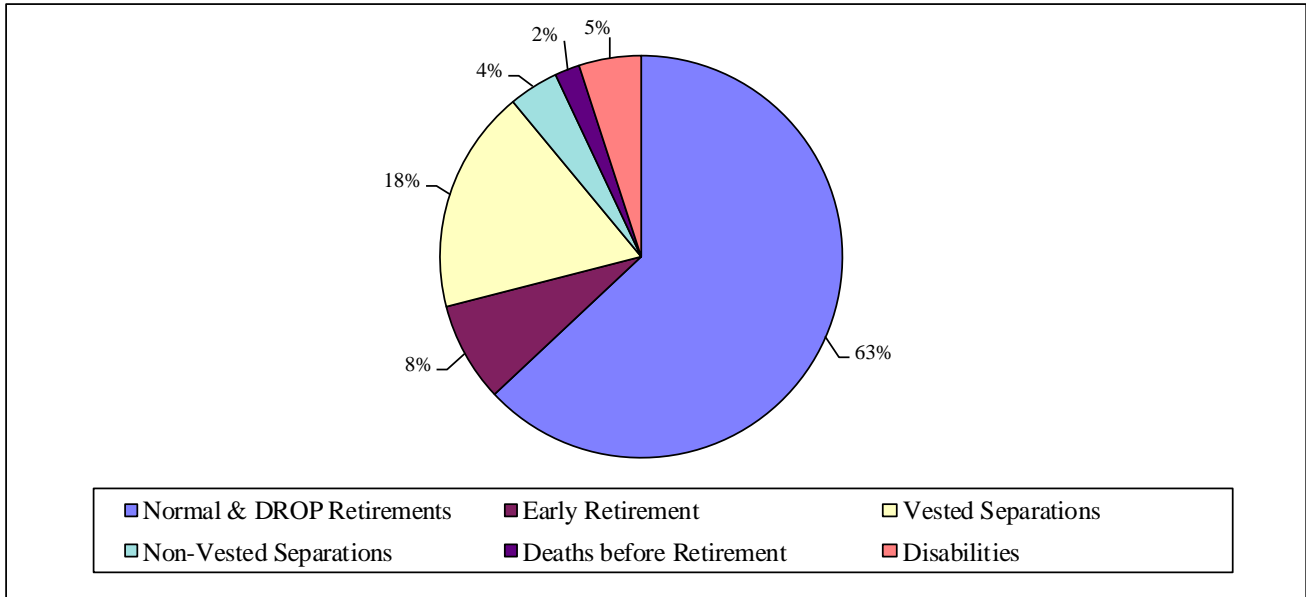
**TIER ONE AND TIER TWO PARTICIPANTS
AS OF JUNE 30, 2016**

	No.	Group Averages		
		Age	Service	Pay
Tier One	70	49.3 yrs.	21.5 yrs.	\$67,471
Tier One - DROP *	58	55.4	36.4	67,241
Tier Two	426	37.6	8.5	48,886
Total	554	40.9	13.1	\$53,156

* \$67,241 was used as an estimate of average annual pay for DROP participants.

DEVELOPMENT OF PRESENT POPULATION JUNE 30, 2016

Expected Terminations from Active Employment for Current Active Members



The chart shows the expected future development of the present population in simplified terms. The Retirement System presently covers 496 active members (not in the DROP). Eventually, 4% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for a monthly benefit. 89% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by separating from service without withdrawing contributions. Seven percent (7%) of the present population is expected to become eligible for death-in-service or disability benefits.

**REPORTED ASSETS
APPLICABLE TO BENEFIT LIABILITIES**

Reserve Account	Fund Balance		
	Tier One	Tier Two	Total
Member Deposit Account	\$ 293,784	\$ 276,001	\$ 569,785
MDA Interest Reserve	(71,396)	36,407	(34,989)
Employers Accumulation Account*	(49,237,630)	50,324,057	1,086,427
Retirement Reserve Account*	257,392,536	3,100,234	260,492,770
Deferred Annuity Account*	858,691	1,941,181	2,799,872
DROP Reserve	8,005,052	0	8,005,052
Misc. Reserve Accounts	1,095	0	1,095
Total	\$217,242,132	\$55,677,880	\$272,920,012
Funding Value Adjustment	12,988,077	3,328,768	16,316,845
Valuation Assets	\$230,230,209	\$59,006,648	\$289,236,857

* After recommended reserve transfers (see page A-6).

REVENUES & EXPENDITURES

Assets Beginning of Year - Market Value		\$279,657,570
Revenues:	Member Contributions	0
	Employer Payroll Contributions ^{&}	6,587,211
	Employer Supplemental Contributions	6,233,769
	Other Sources*	6,892,315
	Investment Income	906,361
	Other	0
	Total Revenue	20,619,656
Expenditures:	Retirement Benefits Paid	26,035,466
	Refund of Member Contributions	0
	Administrative Expenses	205,342
	Investment Expenses	1,116,406
	Other	0
	Total Expenditures	27,357,214
Assets End of Year - Market Value		\$272,920,012

[&] 22% of payroll.

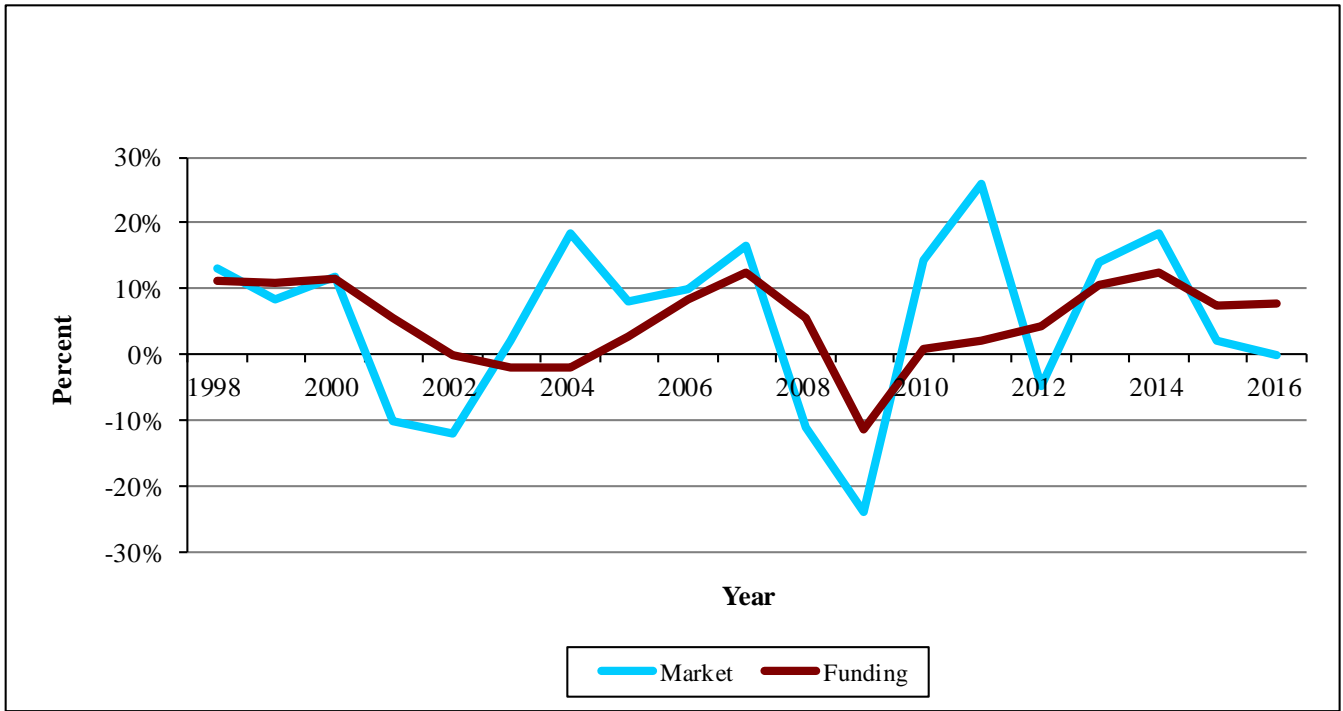
* Includes court fees, drivers' license reinstatement fees, motor vehicle title fees and other items.
Employer contributions by source were not reported for the June 30, 2015 valuation.

DEVELOPMENT OF FUNDING VALUE OF ASSETS

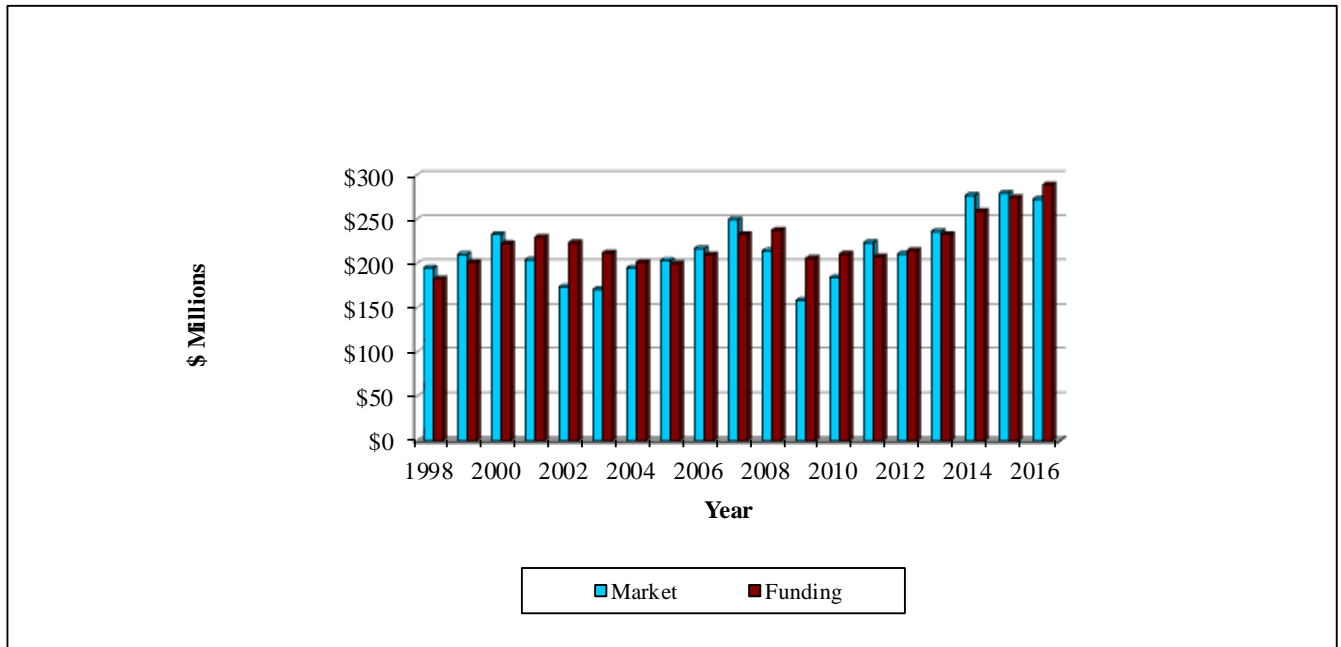
Valuation Date June 30:	2014	2015	2016	2017	2018	2019
A. Funding Value Beginning of Year	\$233,152,854	\$259,458,978	\$274,826,888			
B. Market Value End of Year	277,201,968	279,657,570	272,920,012			
C. Market Value Beginning of Year	236,270,435	277,201,968	279,657,570			
D. Non-Investment Net Cash Flow	(2,186,555)	(3,479,857)	(6,527,513)			
E. Investment Return:						
E1. Market Total: B-C-D	43,118,088	5,935,459	(210,045)			
E2. Assumed Rate	8.00%	7.75%	7.50%			
E3. Amount for Immediate Recognition	18,565,888	19,974,904	20,370,185			
E4. Amount for Phased-In Recognition	24,552,200	(14,039,445)	(20,580,230)			
F. Phased-In Recognition of Investment Return:						
F1. Current Year: 0.25xE4	6,138,050	(3,509,861)	(5,145,058)			
F2. First Prior Year	3,084,165	6,138,050	(3,509,861)	\$ (5,145,058)		
F3. Second Prior Year	(6,839,491)	3,084,165	6,138,050	(3,509,861)	\$ (5,145,058)	
F4. Third Prior Year	7,544,067	(6,839,491)	3,084,166	6,138,050	(3,509,862)	\$ (5,145,056)
F5. Total Recognized Investment Gain (Loss)	9,926,791	(1,127,137)	567,297	(2,516,869)	(8,654,920)	(5,145,056)
G. Funding Value End of Year:						
G1. Preliminary Funding Value End of Year: A+D+E3+F5	259,458,978	274,826,888	289,236,857			
G2. 130% of Market Value Corridor	360,362,558	363,554,841	354,796,016			
G3. 70% of Market Value Corridor	194,041,378	195,760,299	191,044,008			
G4. Funding Value End of Year	259,458,978	274,826,888	289,236,857			
H. Difference Between Market & Funding Values	17,742,990	4,830,682	(16,316,845)			
I. Recognized Rate of Return	12.3%	7.3%	7.7%			
J. Market Value Rate of Return	18.3%	2.2%	(0.1%)			
K. Ratio of Funding Value to Market Value	93.6%	98.3%	106.0%			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased-in over a closed 4-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. If assumed rates are exactly realized for 3 consecutive years, funding value will become equal to market value.

COMPARISON OF RATES OF RETURN



COMPARISON OF ASSET VALUES



SECTION C

RESULTS OF GAIN/LOSS ANALYSIS

COMMENTS

Purpose of Gain/Loss Analysis. Regular actuarial valuations provide information about the composite change in unfunded actuarial accrued liabilities -- whether or not the liabilities are increasing or decreasing and by how much. However, valuations do not show the portion of the change attributable to each risk area within the retirement system financial mechanism: the rate of investment return which plan assets earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases; and the ages at actual retirement. In an actuarial valuation, assumptions are made as to what these rates will be, for the next year and for decades in the future.

The objective of a gain and loss analysis is to determine the portion of the change in unfunded actuarial accrued liabilities that is attributable to each risk area.

The fact that actual experience differs from assumed experience is to be expected -- *the future cannot be predicted with precision.* The economic risk areas (particularly investment return and pay increases) are volatile.

Changes in actuarial assumptions for a risk area should be made when the differences between assumed and actual experience have been observed to be sizable and persistent. A gain and loss analysis covering a relatively short period may or may not be indicative of *long-term trends, which are the basis of financial assumptions.*

The Arkansas State Police Retirement System had a small aggregate gain during the 2015-2016 observation year. Details are shown on pages C-2 to C-6.

DERIVATION OF EXPERIENCE GAIN/LOSS
YEAR ENDED JUNE 30, 2016
(IN \$1,000'S)

Actual experience will not (except by coincidence) coincide exactly with assumed experience. Gains and losses often cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain/loss is shown below.

(1) UAAL * at start of year	\$ 124,138
(2) Normal cost from last valuation	6,315
(3) Employer contributions	19,713
(4) Interest accrual: $(1) \times 0.075 + ((2) - (3)) \times 0.0375$	8,808
(5) Expected UAAL before changes: $(1) + (2) - (3) + (4)$	119,548
(6) Change for revised actuarial assumptions and/or valuation methods	0
(7) Change from benefit changes	0
(8) Expected UAAL after changes: $(5) + (6) + (7)$	119,548
(9) Actual UAAL at end of year	119,502
(10) Gain/loss: $(8) - (9)$	\$ 46
<hr/>	
(11) Gain/loss as percent of actuarial accrued liabilities at start of year	0.0%

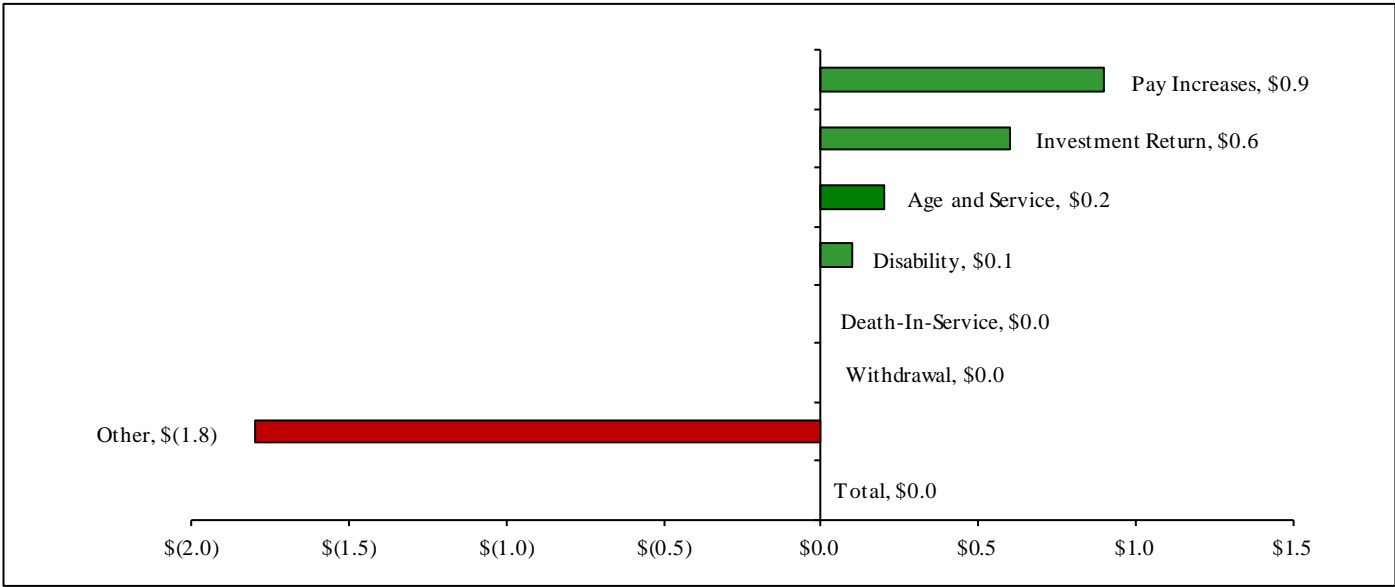
* *Unfunded actuarial accrued liability.*

**GAINS & LOSSES BY RISK AREA
DURING THE PERIOD JULY 1, 2015 TO JUNE 30, 2016**

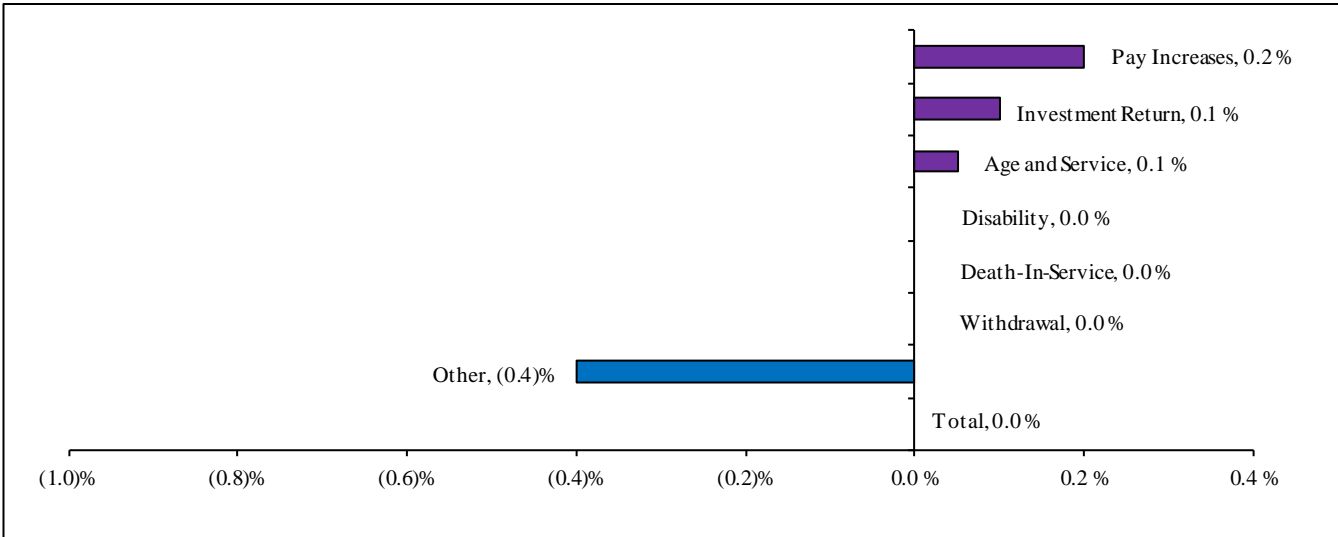
Type of Risk Area	Gain/Loss in Period	
	\$ Millions	Percent of Liabilities
ECONOMIC RISK AREAS		
<i>Pay Increases.</i> If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	\$ 0.9	0.2 %
<i>Investment Return.</i> If there is greater recognized investment return than assumed, there is a gain. If less return, a loss.	0.6	0.1 %
NON-ECONOMIC RISK AREAS		
<i>Age & Service Retirements.</i> If members retire at older ages or with lower final average pays than assumed, there is a gain. If younger ages or higher average pays, a loss.	0.2	0.1 %
<i>Disability Retirements.</i> If there are fewer disabilities than assumed, there is a gain. If more, a loss.	0.1	0.0 %
<i>Death-in-Service Benefits.</i> If there are fewer claims than assumed, there is a gain. If more, a loss.	0.0	0.0 %
<i>Withdrawal.</i> If more liabilities are released by other separations than assumed, there is a gain. If smaller releases, a loss.	0.0	0.0 %
Actuarial Gain/Loss	\$1.8	0.4 %
<i>Other.</i> Gains and losses resulting from group size change, data adjustments, timing of financial transactions, and retiree mortality.	(1.8)	(0.4)%
TOTAL GAIN (OR LOSS) DURING PERIOD	\$0.0	0.0 %

GAINS & LOSSES BY RISK AREA ACTUARIAL GAIN/LOSS EXPERIENCE 2015-2016 YEAR

Amount as \$ Millions



% of Accrued Liabilities



**GAINS & LOSSES BY RISK AREA
COMPARATIVE STATEMENT
(\$ IN MILLIONS)**

Year Ending June 30	Gain/Loss by Risk Area							Total Experience Gain/Loss	% of AAL	Accrued Liability End of Year
	Pay Increases	Investments	Age & Service Retirement	Disability	Death-in- Service	Withdrawal	Other	Dollars		
1995	\$(2.2)	\$(5.2)	\$(0.3)	\$(0.2)	\$(0.3)	\$(0.4)	\$(0.3)	\$ (8.9)	(5.8)%	\$170.0
1996@	2.1	1.8	(0.9)	0.1	0.0	0.3	0.5	3.9	2.3 %	181.0
1997	1.8	4.1	(0.2)	0.1	0.0	(0.1)	0.3	6.0	3.3 %	190.7
1998	3.0	5.6	(0.7)	0.1	0.0	0.4	(4.1)	4.3	2.2 %	203.5
1999	1.6	5.6	(0.7)	0.1	0.0	(0.5)	(2.0)	4.1	2.0 %	221.2
2000	1.5	7.5	0.7	0.1	0.0	(0.1)	0.8	10.5	4.8 %	233.0
2001	1.5	(5.0)	0.6	0.1	(0.2)	(0.1)	1.3	(1.8)	(0.8)%	242.4
2002	1.5	(18.0)	0.1	0.1	0.1	0.4	3.5	(12.3)	(5.1)%	251.8
2003	1.3	(21.9)	0.0	0.0	0.0	2.8	21.2	3.4	1.3 %	261.5
2004	(8.0)	(20.5)	0.1	0.1	0.0	4.7	1.1	(22.5)	(8.6)%	275.7
2005	1.7	(10.3)	0.0	0.1	0.0	0.0	(3.5)	(12.0)	(4.2)%	281.3
2006	0.5	1.3	(0.1)	0.1	0.0	0.4	(0.6)	1.6	0.6 %	291.2
2007@	2.5	9.6	(0.4)	0.2	0.0	2.9	(3.5)	11.3	3.9 %	307.7
2008	(2.0)	(5.4)	(0.7)	0.0	0.0	0.4	(0.8)	(8.5)	(2.8)%	320.1
2009@	(0.7)	(45.0)	(1.6)	0.1	0.0	(0.2)	1.5	(45.9)	(14.4)%	325.9
2010	3.8	(14.8)	(0.5)	0.1	0.0	(0.4)	2.3	(9.5)	(2.9)%	333.6
2011	1.5	(12.2)	(1.0)	0.1	0.0	0.1	0.0	(11.5)	(3.5)%	343.2
2012	0.2	(7.6)	(0.4)	0.1	0.0	(0.3)	(0.8)	(8.8)	(2.6)%	355.3
2013@	2.6	5.4	(1.0)	0.0	0.0	0.4	1.3	8.7	2.4 %	361.5
2014@	(0.8)	9.9	(0.4)	0.0	0.0	0.2	1.6	10.5	2.9 %	381.9
2015@	1.1	(1.1)	(0.9)	0.1	0.0	0.0	2.6	1.8	0.5 %	399.0
2016	0.9	0.6	0.2	0.1	0.0	0.0	(1.8)	0.0	0.0 %	408.7

@ Revised actuarial assumptions and/or methods.

**INVESTMENT GAIN/LOSS
DURING THE PERIOD JULY 1, 2015 TO JUNE 30, 2016**

	\$ Millions
1. Total Assets Beginning of Year - Funding Value	\$274.83
2. Total Assets End of Year - Funding Value	
a. Actual	289.24
b. If net investment return had been 7.50%*	288.67
3. Gain/Loss: 2(a) minus 2(b)	
	\$ 0.57

* *“Investment return” as used in this Gain/Loss Analysis means essentially: assumed return plus/minus phase-in recognition of cumulative market gains or losses (see page B-14).*

**SALARY INCREASES
BY AGE GROUP
MEMBERS ACTIVE BOTH BEGINNING AND END OF YEAR
DURING THE PERIOD OF JULY 1, 2015 TO JUNE 30, 2016**

Age Groups	Expected Increase	Actual Increase
25- 29	8.3%	2.3%
30- 34	6.5%	7.1%
35- 39	5.2%	7.5%
40- 44	4.6%	3.1%
45- 49	4.3%	3.7%
50- 54	4.0%	3.7%
55- 59	3.8%	10.0%

**ACTIVE MEMBERS WHO SEPARATED
FROM ACTIVE MEMBERSHIP
DURING THE PERIOD FROM JULY 1, 2015 TO JUNE 30, 2016**

Age Groups	Normal Retirement*		Death-in- Service		Disability Retirement		Terminated Vested		Non-Vested Separations	
	A	E	A	E	A	E	A	E	A	E
20-24									1	0.8
25-29							1	0.7	2	2.7
30-34					0.1		1	2.3	5	2.3
35-39					0.2		2	2.0	1	0.7
40-44					0.4		2	1.6	1	0.2
45-49	1	0.6		0.1	1	0.6		1.2		
50-54	16	8.9		0.1		0.3		0.1	1	
55-59	3	18.9								
60-64		1.0								
65										
Totals	20	29.4		0.2	1	1.6	6	7.9	11	6.7

A: Actual
E: Expected

* From active or DROP to retired status.

SECTION D

ACTUARIAL METHODS AND ASSUMPTIONS

**SUMMARY OF ACTUARIAL ASSUMPTIONS
USED FOR STATE POLICE ACTUARIAL VALUATIONS
ASSUMPTIONS ADOPTED BY BOARD OF TRUSTEES AFTER
CONSULTING WITH ACTUARY**

In accordance with Section 24-6-204 of the Arkansas Code, the Board of Trustees adopts the actuarial assumptions used for actuarial valuation purposes.

The actuarial assumptions used in the valuation are shown in this section. Assumptions were established based upon an Experience Study covering the period July 1, 2006 through June 30, 2012 (please see our report dated February 26, 2013). Economic assumptions have been subsequently updated based on an Experience Study completed for APERS (please see our report dated February 13, 2013) and the results of the Economic Assumption review performed for the Arkansas Judicial Retirement System (please see our report dated August 6, 2015). The actuarial assumptions represent estimates of future payroll.

Economic Assumptions

The investment return rate used in making the valuation was 7.50% per year, compounded annually (net after investment expenses). The assumed real rate of return is the portion of investment return which is more than the wage inflation rate. Considering assumed wage inflation of 3.25%, the 7.50% investment return rate translates to an effective assumed real rate of return of 4.25%. The wage inflation assumption was revised for the June 30, 2015 valuation and the investment assumption was revised for the June 30, 2015 valuation.

Pay increase assumptions for individual active members are shown on page D-5. Part of the assumption for each age is for a merit and/or seniority increase, and the other 3.25% recognizes wage inflation. The wage inflation assumption consists of 2.5% for price inflation and 0.75% for real wage growth. The pay increase assumption for individual active members was revised for the June 30, 2015 valuation.

Total active member payroll is assumed to increase 3.25% a year, which is the portion of the individual pay increase assumptions recognizing wage inflation.

The number of active members is assumed to continue at the present number.

Non-Economic Assumptions

The mortality tables used to measure retired life mortality were the RP-2000 Combined Healthy mortality table, Projected to 2020 using Projection Scale BB, set-forward 2 years for males and 1 year for females. Related values are shown on page D-3. Disability post-retirement mortality was assumed to be the same as standard post-retirement mortality set forward an additional 10 years. Based upon the experience observed during the most recent experience study, it appears that at the time of the study, the current table provides for an approximate 14% margin for future mortality improvement. Pre-retirement mortality rates are assumed to be 50% of post-retirement mortality rates. The mortality assumption was revised for the June 30, 2013 valuation.

The probabilities of retirement for members eligible to retire are shown on page D-4. The assumption was revised for the June 30, 2013 valuation.

The probabilities of death-in-service, disability and withdrawal from service are shown for sample ages on page D-5. The assumption for death-in-service was revised for the June 30, 2013 valuation.

The individual entry-age normal actuarial cost method of the valuation was used in determining 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 (principal & interest) which are level percent-of-payroll contributions.

Present assets (cash & investments) were valued on a market related basis in which differences between actual and assumed returns are phased-in over a four year period.

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.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA).

**SINGLE LIFE RETIREMENT VALUES
 RP-2000 COMBINED HEALTHY PROJECTED TO 2020 MORTALITY
 MALE RATES SET-FORWARD 2 YEARS
 FEMALE RATES SET-FORWARD 1 YEAR
 AND 7.50% INTEREST**

Sample Ages	Single Life Retirement Values			
	Present Value of \$1 Monthly for Life Increasing 3% Annually		Future Life Expectancy (Years)	
	Men	Women	Men	Women
50	\$195.44	\$205.97	31.13	34.64
55	179.30	191.41	26.58	29.98
60	161.13	174.51	22.23	25.44
65	141.22	155.67	18.14	21.14
70	119.72	135.45	14.35	17.16
75	97.62	114.39	10.95	13.56
80	76.00	92.98	8.02	10.35

Sample Attained Ages	\$100 Benefit Increasing 3% Yearly
55	\$100.00
60	115.93
65	134.39
70	155.79
75	180.60
80	209.36

PROBABILITIES OF RETIREMENT FOR MEMBERS ELIGIBLE TO RETIRE

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year		Years of Service	Percent of Eligible Active Members Retiring Within Next Year
	Tier One	Tier Two		Tier Two
47	2%	-		
48	2%	-		
49	2%	-		
50	6%	2%	30	25%
51	6%	2%	31	15%
52	10%	2%	32	15%
53	10%	6%	33	20%
54	10%	6%	34	35%
55	10%	25%	35	40%
56	10%	20%	36 & Over	100%
57	15%	18%		
58	20%	18%		
59	35%	20%		
60	40%	25%		
61	50%	30%		
62	60%	100%		
63	80%	100%		
64	100%	100%		
65	100%	100%		

A member is assumed to be eligible to retire at age 52 (55 for Tier Two) with 17 years of service, or at any age with 30 years of service (Tier Two). A member is assumed to be eligible to retire early at age 47 (50 for Tier 2) with 17 years of service. For a Tier 2 member with 30 or more years of service at the beginning of a year, the percentages shown for service based retirement (30 or more years) take precedence over the percentages associated with age based retirement.

It was assumed that members eligible to enter the DROP will do so to maximize the value of their benefits.

**SEPARATIONS FROM ACTIVE EMPLOYMENT BEFORE
AGE AND SERVICE RETIREMENT
& INDIVIDUAL PAY INCREASES**

Sample Ages	Percent of Active Members Separating Within the Next Year				Pay Increase Assumptions for Active Members		
	Death		Disability	Other	Merit & Seniority	Base (Economic)	Increase Next Year
	Male	Female					
20	0.02%	0.01%	0.06%	5.50%	6.29%	3.25%	9.54%
25	0.02%	0.01%	0.09%	5.50%	5.39%	3.25%	8.64%
30	0.03%	0.01%	0.19%	5.50%	4.01%	3.25%	7.26%
35	0.04%	0.02%	0.31%	4.18%	2.29%	3.25%	5.54%
40	0.06%	0.04%	0.43%	2.64%	1.50%	3.25%	4.75%
45	0.08%	0.06%	0.55%	1.43%	1.10%	3.25%	4.35%
50	0.13%	0.09%	0.67%	0.55%	0.80%	3.25%	4.05%
55	0.22%	0.14%	0.79%	0.00%	0.60%	3.25%	3.85%

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

JUNE 30, 2016

Marriage Assumption:	95% of males and 95% of females are assumed to be married for purposes of death-in-service benefits. 90% of males and 90% of females are assumed to be married for purposes of death-after-retirement benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Pay Increase Timing:	Beginning of 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.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and withdrawal decrements do not operate during the period a member is assumed to be eligible for an unreduced benefit.
DROP Participants:	For members participating in the DROP, reported payroll is multiplied by 3.7 to estimate present value of future salaries. Payroll data was provided for the month of June 2016 and included additional pay items that did not allow pay to be annualized. \$67,241 was used as an estimate of average annual pay for DROP participants.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Tier One DROP Interest Credit:	Interest is assumed to be credited at 3.25%.
Tier Two DROP Interest Credit:	Interest is assumed to be credited at 3.25%.
Other Liability Adjustments:	Active member non-refund normal costs and actuarial accrued liabilities were increased by 1.5% to reflect non-reported reciprocal service.
Administrative Expenses	The normal cost was increased by 0.70% of payroll to fund administrative expenses.

SECTION E
FINANCIAL PRINCIPLES

FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES OF ASPRS

Promises Made, and Eventually Paid. As each year is completed, ASPRS in effect hands an “IOU” to each member then acquiring a year of service credit --- the “IOU” says: “The Arkansas State Police 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 law governing ASPRS financing intends that this year’s taxpayers contribute the money to cover the IOUs being handed out this year. By following this principle, funds will be accumulated during members’ periods of active participation which, when combined with investment income, are expected to be sufficient to pay promised benefits throughout the years of retirement.

An inevitable by-product 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 members 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 ...

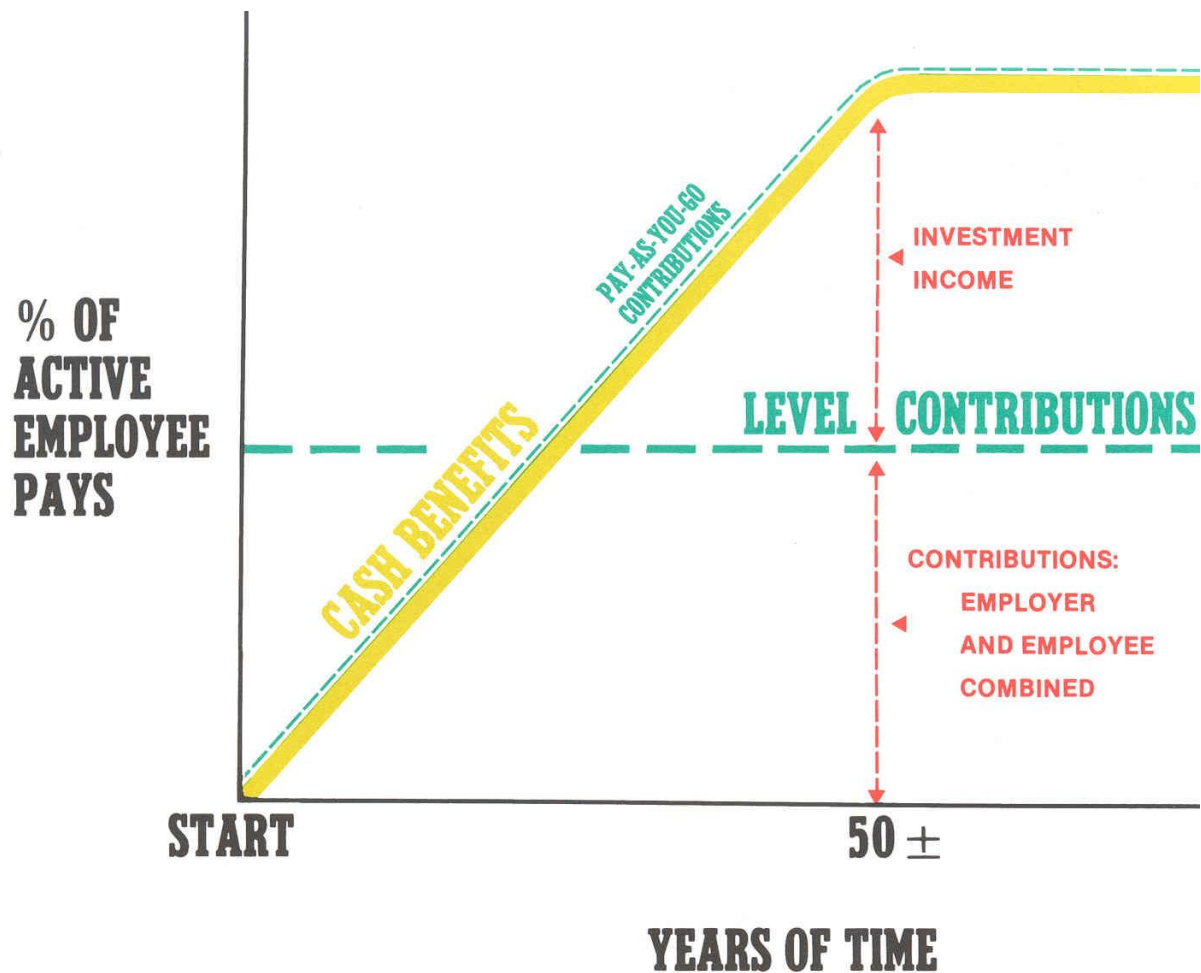
Interest on Unfunded Actuarial Accrued Liabilities (unfunded actuarial accrued liabilities are the difference between: the actuarial accrued liabilities for members' service already rendered; and the actuarial value of assets of ASPRS).

Computing Contributions to Support Fund Benefits. From a given schedule of benefits and from the employee data and asset data provided, the actuary determines the contribution rates to support the benefits, by means of ***an actuarial valuation and a funding method.***

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 plan 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 wisdom of the assumptions or the skill of the actuary and the many calculations made. ASPRS 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 ***continuing 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 previous 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) which 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.
 - Retirees now receiving benefits
 - Former members with vested benefits not yet payable
 - Active members
- B. + ***Asset Data*** (cash & investments), furnished by the plan administrator.
- C. + ***Benefit provisions*** that establish eligibility and amounts of payments to members.
- D. + ***Assumptions concerning future 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***

SECTION F

ADDITIONAL ACTUARIAL INFORMATION

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

SCHEDULE OF FUNDING PROGRESS (\$MILLIONS)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Entry Age AAL (b)	UAAL (b)-(a)	Funded Ratio (a)/(b)	Annual Covered Payroll (c)	UAL as a Percentage of Covered Payroll [(b-a)/(c)]
6/30/1995	\$126.50	\$170.00	\$ 43.51	74.4%	\$18.14	239.9%
6/30/1996	149.15	180.50	31.35	82.6%	18.43	170.1%
6/30/1997	164.66	190.73	26.07	86.3%	18.98	137.4%
6/30/1998	183.00	204.10	21.10	89.7%	19.65	107.4%
6/30/1999	201.75	221.17	19.42	91.2%	20.94	92.7%
6/30/2000	222.87	232.99	10.12	95.7%	21.31	47.5%
6/30/2001	229.92	242.35	12.43	94.9%	21.86	56.9%
6/30/2002	223.77	251.76	28.00	88.9%	20.76	134.9%
6/30/2003	212.45	261.50	49.05	81.2%	20.50	239.2%
6/30/2004	201.83	275.72	73.89	73.2%	22.36	330.5%
6/30/2005 #@	200.10	281.28	81.18	71.1%	22.52	360.5%
6/30/2006	210.34	291.17	80.82	72.2%	23.38	345.7%
6/30/2007 @	233.13	307.66	74.53	75.8%	24.00	310.6%
6/30/2008	238.04	320.10	82.06	74.4%	25.91	316.7%
6/30/2009 #@	206.32	325.94	119.62	63.3%	26.80	446.4%
6/30/2010	211.07	333.60	122.53	63.3%	28.51	429.7%
6/30/2011	208.05	343.21	135.16	60.6%	28.06	481.6%
6/30/2012	215.01	355.30	140.29	60.5%	28.43	493.5%
6/30/2013 @	233.15	361.46	128.31	64.5%	28.01	458.1%
6/30/2014 @	259.46	381.86	122.40	67.9%	28.55	428.7%
6/30/2015 @	274.83	398.96	124.14	68.9%	29.93	414.8%
6/30/2016	289.24	408.74	119.50	70.8%	29.45	405.8%

After legislated changes in benefit provisions.

@ After changes in actuarial assumptions or methods.

SCHEDULE OF EMPLOYER CONTRIBUTIONS

Year Ended June 30	Annual Required Contribution	Percent Contributed
1994	\$ 6,031,718	81.08%
1995	6,596,421	79.48%
1996	7,127,246	81.56%
1997	6,704,081	91.16%
1998	6,768,125	106.56%
1999	6,454,835	104.55%
2000	6,356,114	109.16%
2001	5,883,192	120.77%
2002	5,780,658	119.39%
2003	6,298,145	107.80%
2004	8,375,966	90.71%
2005	9,869,227	79.70%
2006	9,988,919	96.59%
2007	9,852,432	116.39%
2008	9,996,439	116.56%
2009	10,535,605	115.25%
2010	12,748,302	161.18%
2011	12,580,828	112.30%
2012	14,052,962	139.94%
2013	13,564,538	143.56%
2014	13,956,098	139.74%
2015	14,171,551	139.60%
2016	14,285,512	138.00%

SUPPLEMENTARY INFORMATION

Valuation Date	June 30, 2016
Actuarial Cost Method	Entry Age Normal Cost
Amortization Method	Level Percent-of-Payroll
Remaining Amortization Period	23-year closed
Asset Valuation Method	4-year smoothed market
Actuarial Assumptions:	
Investment Rate of Return	7.50%
Projected Salary Increases	3.25% - 10.25%
Including Wage Inflation at	3.25%
Cost-of-Living Adjustments	3.0% Annual compound increases
Retirees and Beneficiaries Receiving Benefits	634
Terminated Plan Members Entitled to but not yet Receiving Benefits	76
DROP Members	58
Active Plan Members	<u>496</u>
Total	1,264

SECTION G
APPENDIX I

STATUTORY EMPLOYER CONTRIBUTIONS ARKANSAS CODE SECTION 24-6-209

24-6-209. Employer's contribution.

(a) The Department of Arkansas State Police, as employer, shall make contributions to the Arkansas State Police Retirement System of twenty-two percent (22%) of active member payroll.

(b) The Director of the Department of Finance and Administration, at the request of the Executive Secretary of the Arkansas State Police Retirement System, is authorized and directed to make annual transfers on each June 30 to the State Police Retirement Fund from the remainder of insurance premium taxes enumerated in A.C.A. 19-6-301(27) before they are transferred to General Revenues enumerated in A.C.A. 19-6-201(19) such amounts of money necessary to amortize the unfunded liabilities over a period not to exceed thirty (30) years for those members not covered by the provisions of A.C.A. 24-6-401 et. seq. These transfers are intended to cover the unfunded accrued actuarial liabilities of the State Police Retirement Fund and shall not be used for the purpose of providing any benefit enhancements for the State Police Retirement System. Members of the Tier One-State Police Retirement System shall not be entitled to any benefit enhancements from these transfers unless funds from sources other than insurance premium taxes are found to provide for the retirement benefit enhancements. The amount of the transfer shall be determined by computing the dollar amount required based on the actuarially determined employer rate in the most recent annual actuarial valuation and subtracting from that amount the statutory contribution amount specified in subsection (a) of this section, the court fees provided by Act 1256 of 1995, and the driver's license renewal fees provided by Act 730 of 1995.

(c) The intent of this section is to provide for funding of any amounts of unfunded accrued actuarial liabilities of the Tier One-State Police Retirement Fund existing on June 30, 1997. These transfers shall be limited in use solely for the purpose of paying those liabilities and nothing more. In the event the transfers under this section exceed eight hundred thousand dollars \$(800,000) per fiscal year, the Executive Secretary of the Arkansas State Police Retirement System shall notify the Joint Committee on Public Retirement and Social Security Programs which shall then review the use of the funds and the benefit provisions of the systems and the actuarial reports on the retirement systems to ensure compliance with the intended purpose of the funds.

November 11, 2016

Ms. Gail H. Stone
Executive Secretary
Arkansas State Police Retirement System
One Union National Plaza
124 West Capitol, 4th Floor
Little Rock, Arkansas 72201

**Re: State Police Retirement System Report of the June 30, 2016 Actuarial
Valuation and the 2015/2016 Gain/Loss Analysis**

Dear Gail:

Please find enclosed 30 copies of this report. As usual, your comments and questions are welcome.

Sincerely,



David L. Hoffman

DLH:dj
Enclosures