Arkansas State Police Retirement System

Annual Actuarial Valuation and the Gain/Loss Analysis of Experience
June 30, 2018

Report of the
Annual Actuarial Valuation and
Gain/Loss Analysis of the
Arkansas State Police Retirement System

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November 9, 2018

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, 2018, and the Gain/Loss Analysis of Experience among Active Members from July 1, 2017 to June 30, 2018*** 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, 2018. 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, 2018. 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 is a Member of the American Academy of Actuaries (MAAA) and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,

Mita Drazilov

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MDD/DLH:bd

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, 2018 valuation.

Assumption Changes. The June 30, 2018 valuation reflects a change in assumptions resulting from the experience study covering the period from July 1, 2012 to June 30, 2017.

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, 2018 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. On a funding value of assets basis, the System has a 72% funded ratio. On a market value of assets basis, the System has a 73% funded ratio.

Employer Contribution Rates. Based upon experience through June 30, 2018, the State Police contribution rate will be 51.43% of covered payroll for the fiscal year beginning July 1, 2018.

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 the plan earning 7.15% 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 21 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, 2018

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, and future beneficiaries of current retirees	$284,613,934	$ 0	$284,613,934
Age and service benefits based on service likely to be rendered by present active members and DROP participants	$195,936,664	$46,727,065	$149,209,599
Separation benefits likely to be paid present active and inactive members	$ 10,842,669	$ 6,361,754	$ 4,480,915
Disability benefits likely to be paid present active members	$ 7,135,471	$ 4,349,973	$ 2,785,498
Death-in-service benefits likely to be paid on behalf of present active members	$ 3,073,297	$ 1,232,803	$ 1,840,494
Total	$501,602,035	$58,671,595	$442,930,440
Valuation assets			$319,790,287
Unfunded actuarial accrued liabilities			$123,140,153

Amortization of
Unfunded Actuarial Accrued Liabilities (UAAL)
June 30, 2018

Description		Remaining Years	Amount
Active Member UAAL			
Act 1071 of 1997#		21	$ 97,793,019
Remainder	- Tier One (Including DROP)	21	18,318,073
	- Tier Two	21	7,029,061
Total Active			123,140,153
Total UAAL			**$123,140,153**

See page G-1.

Computed Employer Contribution Rates
as of June 30, 2018
Expressed as Percents of Active Member Payroll

	Contributions Expressed as Percents of Covered Payroll		
Contributions for	**Tier 1 ***	**Tier 2**	**Weighted Average**
Normal Cost			
Age and Service Annuities	17.62 %	17.49 %	17.53 %
Separation Benefits	2.09 %	2.21 %	2.18 %
Disability Benefits	1.48 %	1.59 %	1.56 %
Death-in-Service Annuities	0.59 %	0.45 %	0.48 %
Administrative Expenses	0.70 %	0.70 %	0.70 %
Total	22.48 %	22.44 %	22.45 %
Unfunded Actuarial Accrued Liabilites@	107.16 %	2.22 %	28.98 %
Total Computed Employer Contribution Rate	129.64 %	24.66 %	51.43 %

** Covered payroll includes all active members, including DROP participants. Valuation payroll totals $29,593,145.*

@ Unfunded actuarial accrued liabilities were amortized over a closed 21 year period.

Computed Employer Contribution Rates
Comparative Statement

June 30	Active Members in Valuation Number	Active Members in Valuation Average Pay $	Change in Average Pay %	Change in CPI: Inflation	UAAL Financing Period	Computed Employer Rate&
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	46.57%
2017	528	55,070	3.6 %	1.7 %	22	52.01%
2017@	528	55,070	3.6 %	1.7 %	22	51.21%
2018	528	56,048	1.8 %	2.9 %	21	51.43%
10-Year Average			**1.8 %**	**1.4 %**		

& *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

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; and
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.

	Entry Age Accrued Liability							
	(1)	(2)	(3)		Portion of Present Values Covered By Valuation Assets			
Valuation Date June 30	Active Members Contr.	Retirees and Benef.	Active Member (Employer Financed Portion)	Valuation Assets	(1)	(2)	(3)	Total
			($ in Millions)					
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	297.91	100%	100%	19%	71%
2017	0.57	277.14	154.17	305.85	100%	100%	18%	71%
2017@	0.57	273.86	154.62	305.85	100%	100%	20%	71%
2018	**0.62**	**284.61**	**157.70**	**319.79**	**100%**	**100%**	**22%**	**72%**

\# *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 an actuarial loss this year. On a funding value of assets basis, the funded status increased to 72% (see page A-5). On a market value of assets basis, the funded status is 73% (up from 69% last year). As of June 30, 2018, unrecognized cumulative investment gains totaling $5.1 million remain to be recognized in the next three years (see page B-14). If there are no new losses to offset scheduled investment recognition during this coming period and based upon a 21-year amortization period, the employer contribution rate would be expected to decrease by approximately 1.2% of payroll from the current level.

Contributions

The impact of the actuarial loss during the year would have caused an increase in the computed employer contribution rate of 1.4% of payroll. Contributions received in excess of the computed rate completely offset this loss. A history of contributions and how these relate to computed contributions is shown on page F-2.

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, 2018 (from) to:		Employer Accum. Account After Transfers
		Deferred Annuity Account	Retirement Reserve Account	
Total	$ 37,332,929	$(448,140)	$10,321,105	$ 27,459,964

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 51.43% of covered payroll for the year beginning July 1, 2018.

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, 2018
by Type of Benefit Being Paid

Type of Benefit Being Paid	Number	Annual Pensions	Actuarial Accrued Liability
Age & Service Retirees			
Life	19	$ 330,816	$ 4,404,766
B-50	410	18,706,522	224,847,259
Totals	429	19,037,338	229,252,025
Beneficiaries of Age & Service Retirees			
B-50	116	2,702,300	24,737,474
Total Age & Service Retirees	545	21,739,638	253,989,499
Disability Retirees			
Life	17	254,988	3,286,282
B-50	38	1,145,796	13,807,997
Totals	55	1,400,784	17,094,279
Beneficiaries of Disability Retirees	1	7,368	84,030
Total Disability Retirees and Beneficiaries	56	1,408,152	17,178,309
Death-in-Service Beneficiaries	29	508,092	5,486,067
QDRO Alternate Payees	38	634,167	7,960,059
Total Retirees and Beneficiaries	**668**	**24,290,049**	**284,613,934**
DROP Participants	**61**	**3,630,132**	**57,641,208**
Total Retirees, Beneficiaries and DROP Participants	**729**	**$ 27,920,181**	**$ 342,255,142**

Also included in the valuation were 84 inactive members eligible to receive vested deferred benefits, commencing at normal retirement age, totaling $913,112 annually.

Retirees and Beneficiaries
by Attained Ages
as of June 30, 2018

	Age and Service		Disabilities		Death in Service	
Attained Ages	**No.**	**Annual Pensions**	**No.**	**Annual Pensions**	**No.**	**Annual Pensions**
Under 40			3	$ 26,352	1	$ 1,008
40-44	1	$ 13,979	4	34,704		
45-49	10	173,274	14	292,440	1	16,020
50-54	31	937,437	4	91,728	1	2,160
55-59	41	1,570,157	3	80,532	1	6,120
60-64	114	4,359,782	8	235,344	4	73,212
65-69	127	4,525,908	11	352,848	7	147,540
70-74	127	5,379,420	7	250,068	4	51,948
75-79	58	2,491,728			4	117,996
80-84	51	2,065,560	2	44,136	3	43,440
85-89	14	498,348			3	48,648
Over 90	9	358,212				
Totals	**583**	**$22,373,805**	**56**	**$1,408,152**	**29**	**$508,092**

Retirees, Beneficiaries and DROP Participants in Actuarial Valuations Comparative Statement

	Number			Annual Pensions		
June 30	Retirees & Beneficiaries	DROP Participants	Total	Retirees & Beneficiaries	DROP Participants	Total
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
2017	650	59	709	23,546,129	3,281,616	26,827,745
2018	668	61	729	24,290,049	3,630,132	27,920,181

Schedule of New Retirees and DROP Participants During the Period of July 1, 2017 to June 30, 2018*

Retirees and DROP Participants

	Age & Service	Disability
Number	35	4
Average Age	53.63	46.50
Average Credited Service	20.14	8.25
Average Monthly Benefit	$ 2,130.66	$ 1,238.75

Retirees Only

	Age & Service	Disability
Number	24	4
Average Age	53.00	46.50
Average Credited Service	18.21	8.25
Average Monthly Benefit	$ 3,105.79	$ 1,238.75

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

Active Members
as of June 30, 2018
by Attained Age and Years of Service

Attained Age	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals No.	Totals Valuation Payroll
	Years of Service to Valuation Date								
20-24	16							16	$ 610,181
25-29	47	10						57	2,370,437
30-34	43	41	9					93	4,345,049
35-39	16	11	37					64	3,296,239
40-44	6	11	34	19	5			75	4,326,500
45-49	6	5	24	18	38			91	5,570,540
50-54		1	10	14	28	2		55	3,444,278
55-59	1	1	5	4	1	1		13	803,727
60									
61		1	1					2	106,800
62	1							1	149,866
Base Totals	**136**	**81**	**120**	**55**	**72**	**3**		**467**	**$25,023,617**
DROP Participants					14	30	17	61	4,569,528
Grand Totals	**136**	**81**	**120**	**55**	**72**	**33**	**17**	**528**	**$29,593,145**

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

	Average
Age:	41.4 years
Service:	12.7 years
Salary:	$56,048

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
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
2017	528	41.7	13.8	55,070
2018	528	41.4	12.7	56,048

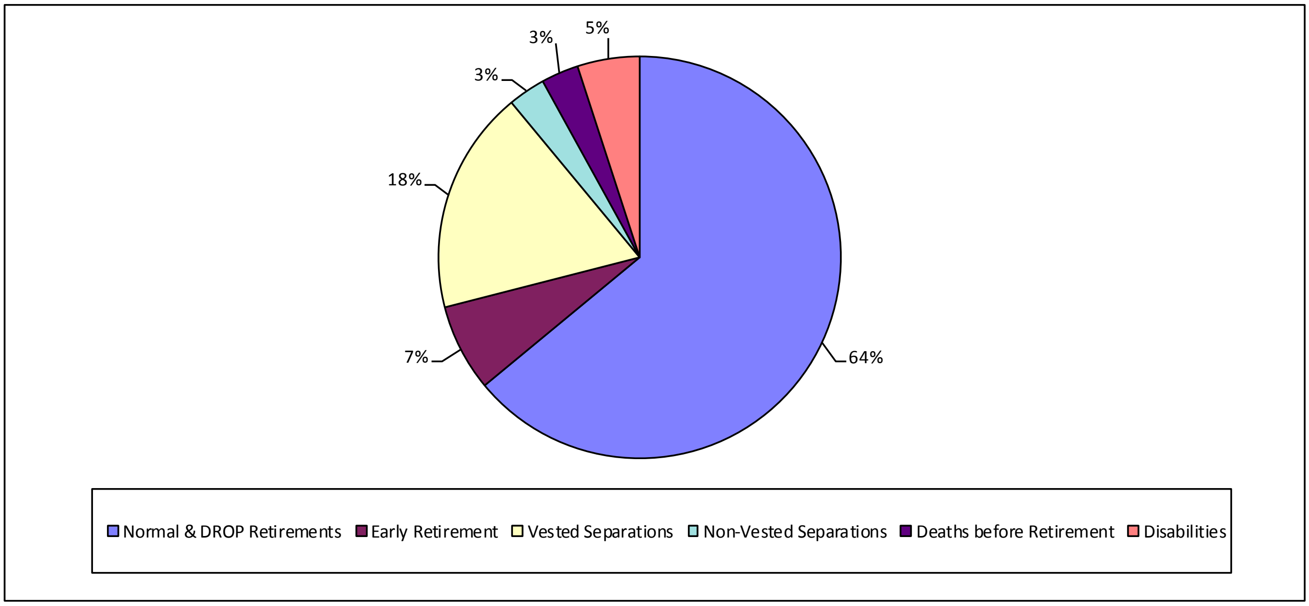
 # Includes DROP participants.

Tier One and Tier Two Participants
as of June 30, 2018

	No.	Group Averages		
		Age	Vesting Service	Pay
Tier One	43	50.0 yrs.	22.3 yrs.	$69,197
Tier One - DROP	61	56.0	28.0	74,910
Tier Two	424	38.4	9.6	52,000
Total	**528**	**41.4**	**12.7**	**$56,048**

Development of Present Population
June 30, 2018

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 467 active members (not in the DROP). Eventually, 3% 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. Eight percent (8%) 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			$ 623,642
MDA Interest Reserve			(28,620)
Employers Accumulation Account			27,459,964
Retirement Reserve Account			284,613,934
DROP Reserve			9,019,947
Deferred Annuity Account			3,248,289
Misc. Reserve Accounts			1,095
Total	**$247,416,354**	**$77,521,897**	**$324,938,251**
Funding Value Adjustment	**(3,919,792)**	**(1,228,172)**	**(5,147,964)**
Valuation Assets	**$243,496,562**	**$76,293,725**	**$319,790,287**

** Fund balances for Tier One and Tier Two were estimated based on the July 1, 2017 to June 30, 2018 employer contributions and benefit payments.*

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

Revenues & Expenditures

Assets Beginning of Year - Market Value		**$299,525,117**
Revenues:	Member Contributions	0
	Employer Payroll Contributions&	
	Tier One	1,738,850
	Tier Two	4,722,182
	Employer Supplemental Contributions	6,133,550
	Other Sources*	8,409,068
	Investment Income	30,402,944
	Other	0
	Total Revenue	**51,406,594**
Expenditures:	Retirement Benefits Paid	
	Tier One	22,501,301
	Tier Two	459,210
	DROP Benefits Paid	
	Tier One	1,224,907
	Tier Two	0
	Refund of Member Contributions	0
	Administrative Expenses	228,430
	Investment Expenses	1,579,612
	Other	0
	Total Expenditures	**25,993,460**
Assets End of Year - Market Value		**$324,938,251**

& 22% of payroll.

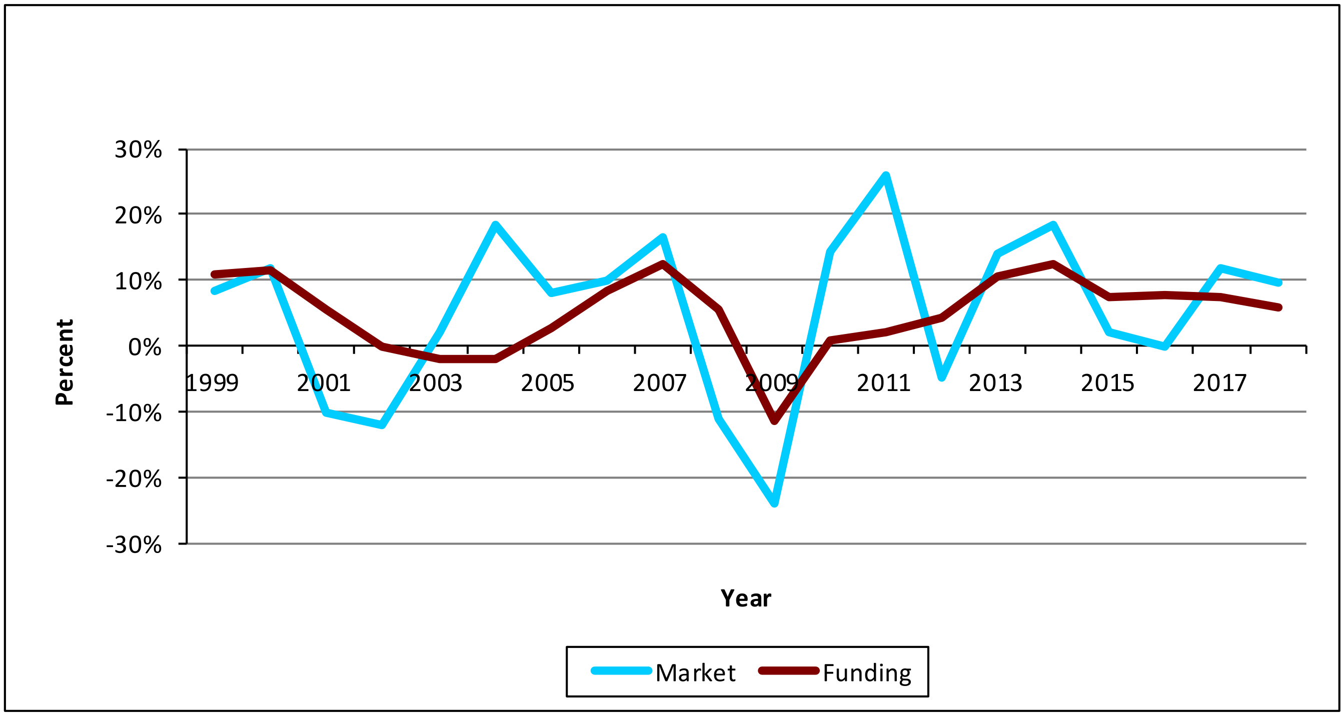
** Includes court fees, drivers' license reinstatement fees, motor vehicle title fees and other items.*

Development of Funding Value of Assets

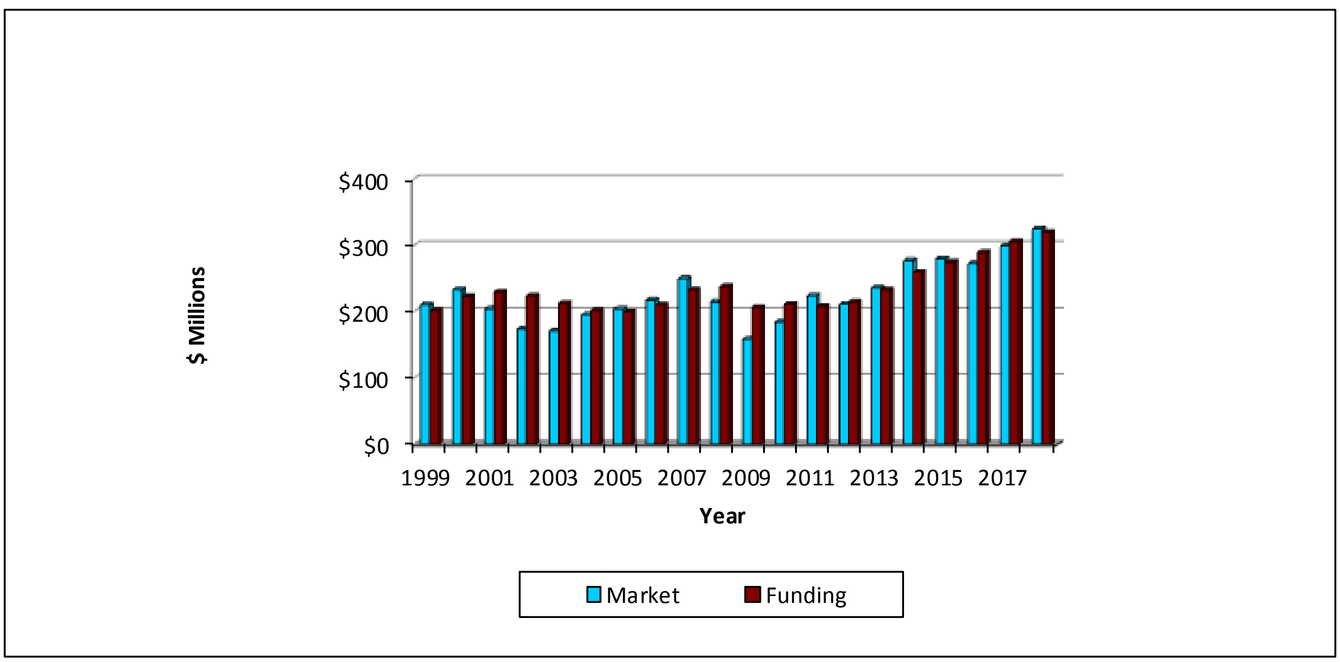
Valuation Date June 30:	2016	2017	2018	2019	2020	2021
A. Funding Value Beginning of Year	$274,826,888	$289,236,857	$305,845,907			
B. Market Value End of Year	272,920,012	299,525,117	324,938,251			
C. Market Value Beginning of Year	279,657,570	272,920,012	299,525,117			
D. Non-Investment Net Cash Flow	(6,527,513)	(4,879,145)	(3,410,198)			
E. Investment Return:						
E1. Market Total: B-C-D	(210,045)	31,484,250	28,823,332			
E2. Assumed Rate	7.50%	7.50%	7.15%			
E3. Amount for Immediate Recognition	20,370,185	21,512,002	21,747,471			
E4. Amount for Phased-In Recognition	(20,580,230)	9,972,248	7,075,861			
F. Phased-In Recognition of Investment Return:						
F1. Current Year: 0.25xE4	(5,145,058)	2,493,062	1,768,965			
F2. First Prior Year	(3,509,861)	(5,145,058)	2,493,062	$ 1,768,965		
F3. Second Prior Year	6,138,050	(3,509,861)	(5,145,058)	2,493,062	$ 1,768,965	
F4. Third Prior Year	3,084,166	6,138,050	(3,509,862)	(5,145,056)	2,493,062	$ 1,768,966
F5. Total Recognized Investment Gain (Loss)	567,297	(23,807)	(4,392,893)	(883,029)	4,262,027	1,768,966
G. Funding Value End of Year:						
G1. Preliminary Funding Value End of Year: A+D+E3+F5	289,236,857	305,845,907	319,790,287			
G2. 130% of Market Value Corridor	354,796,016	389,382,652	422,419,726			
G3. 70% of Market Value Corridor	191,044,008	209,667,582	227,456,776			
G4. Funding Value End of Year	**289,236,857**	**305,845,907**	**319,790,287**			
H. Difference Between Market & Funding Values	(16,316,845)	(6,320,790)	5,147,964			
I. Recognized Rate of Return	**7.7%**	**7.5%**	**5.7%**			
J. Market Value Rate of Return	(0.1%)	11.6%	9.7%			
K. Ratio of Funding Value to Market Value	106.0%	102.1%	98.4%			

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 an aggregate loss during the 2017-2018 observation year. Details are shown on pages C-2 to C-6.

Derivation of Experience Gain/Loss
Year Ended June 30, 2018
(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 (After adoption of new assumptions)	$ 123,208
(2) Normal cost from last valuation	6,568
(3) Employer contributions	21,004
(4) Interest accrual: (1) x 0.0715 + ((2) - (3)) x 0.03575	8,293
(5) Expected UAAL before changes: (1) + (2) - (3) + (4)	117,065
(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)	117,065
(9) Actual UAAL at end of year	123,140
(10) Gain/loss: (8) - (9)	$ (6,075)
(11) Gain/loss as percent of actuarial accrued liabilities at start of year	(1.4%)

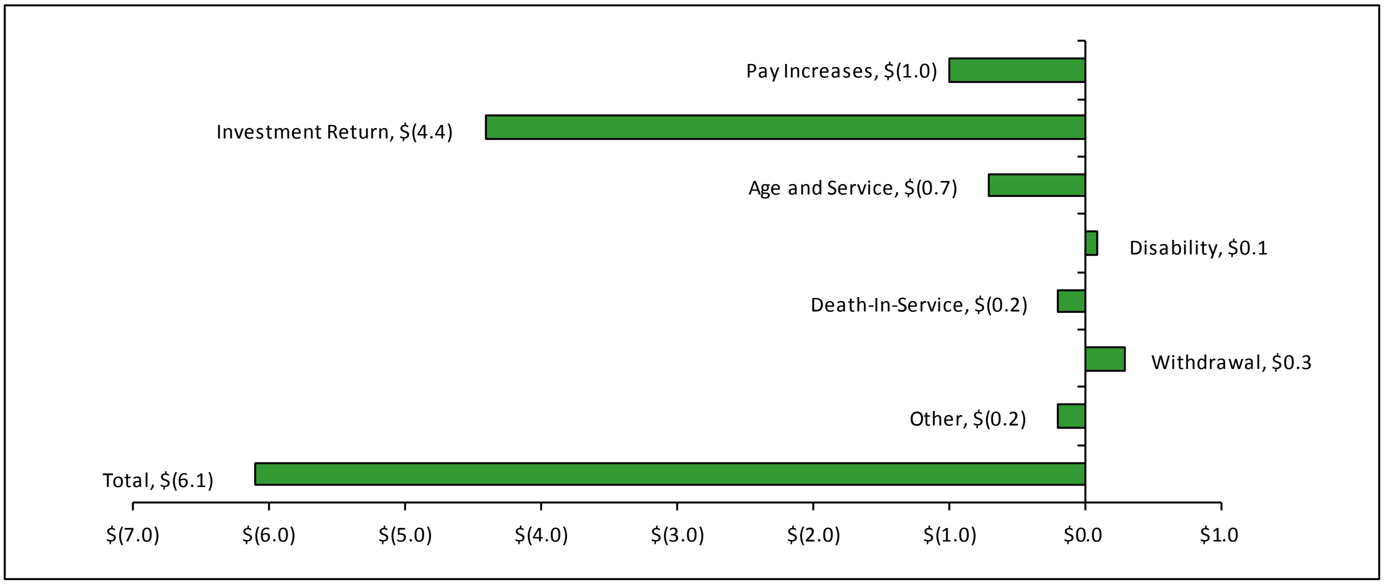
* *Unfunded actuarial accrued liability.*

Gains & Losses by Risk Area
During the Period July 1, 2017 to June 30, 2018

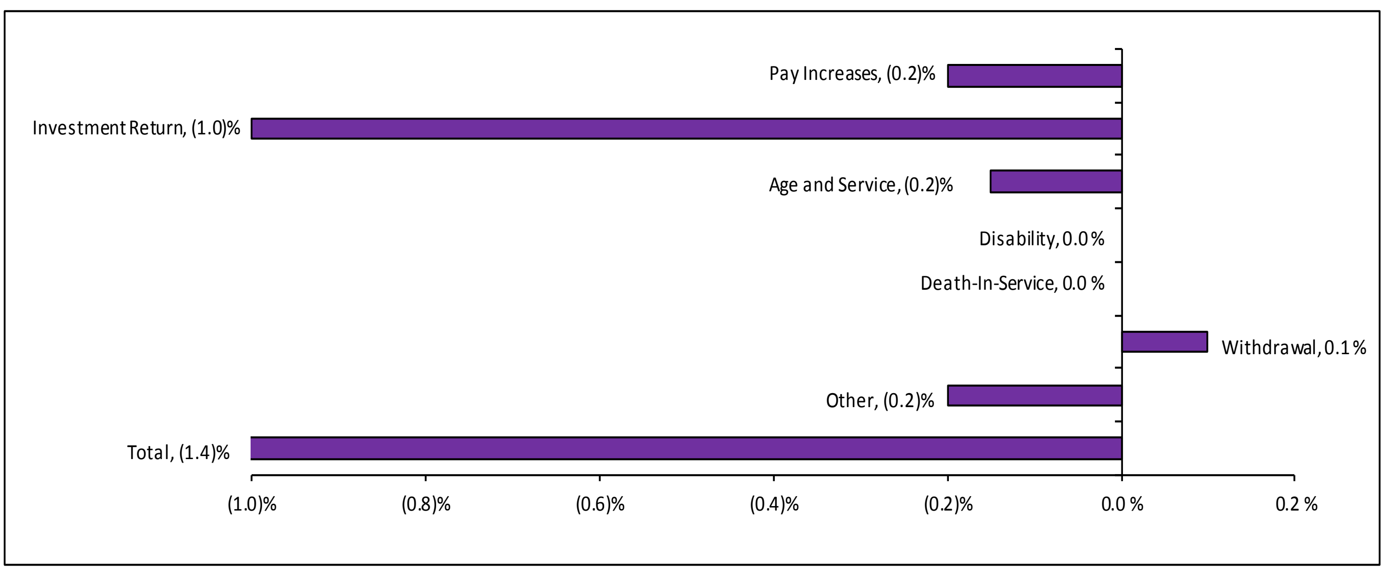
Type of Risk Area	Gain/Loss in Period $ Millions	Gain/Loss in Period Percent of Liabilities
ECONOMIC RISK AREAS		
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	$(1.0)	(0.2)%
Investment Return. If there is greater recognized investment return than assumed, there is a gain. If less return, a loss.	(4.4)	(1.0)%
NON-ECONOMIC RISK AREAS		
Age & Service Retirements. 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.	(0.7)	(0.2)%
Disability Retirements. If there are fewer disabilities than assumed, there is a gain. If more, a loss.	0.1	0.0 %
Death-in-Service Benefits. If there are fewer claims than assumed, there is a gain. If more, a loss.	(0.2)	0.0 %
Withdrawal. If more liabilities are released by other separations than assumed, there is a gain. If smaller releases, a loss.	0.3	0.1 %
Actuarial Gain/Loss	$(5.9)	(1.3)%
Other. Gains and losses resulting from group size change, data adjustments, timing of financial transactions, and retiree mortality.	(0.2)	(0.2)%
TOTAL GAIN (OR LOSS) DURING PERIOD	**$(6.1)**	**(1.4)%**

Gains & Losses by Risk Area
Actuarial Gain/Loss Experience
2017-2018 Year

Amount as $ Millions



% of Accrued Liabilities



Gains & Losses by Risk Area
Comparative Statement
($ in Millions)

	Gain/Loss by Risk Area							Total Experience Gain/Loss		Accrued Liability
Year Ending June 30	Pay Increases	Investments	Age & Service Retirement	Disability	Death-in-Service	Withdrawal	Other	Dollars	% of AAL	End of Year
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
2017	2.1	0.0	(1.4)	0.1	0.0	(0.3)	3.0	3.5	0.8 %	431.9
2017@	2.1	0.0	(1.4)	0.1	0.0	(0.3)	3.0	3.5	0.8 %	429.1
2018	**(1.0)**	**(4.4)**	**(0.7)**	**0.1**	**(0.2)**	**0.3**	**(0.2)**	**(6.1)**	**(1.4)%**	**442.9**

@ *Revised actuarial assumptions and/or methods.*

Investment Gain/Loss
During the Period July 1, 2017 to June 30, 2018

		$ Millions
1.	Total Assets Beginning of Year - Funding Value	$305.85
2.	Total Assets End of Year - Funding Value	
	a. Actual	319.79
	b. If net investment return had been 7.15%*	324.18
3.	Gain/Loss: 2(a) minus 2(b)	$ (4.39)

* *"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, 2017 to June 30, 2018

Age Groups	Expected Increase	Actual Increase
25- 29	6.6%	11.2%
30- 34	5.7%	7.3%
35- 39	4.8%	4.4%
40- 44	4.5%	3.5%
45- 49	4.2%	4.3%
50- 54	4.0%	0.9%
55- 59	3.8%	2.9%

Active Members who Separated from Active Membership During the Period from July 1, 2017 to June 30, 2018

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									2	0.6
25-29								0.7	2	2.2
30-34						0.1	3	3.0	3	1.6
35-39						0.2	2	1.7	1	0.7
40-44				0.1	1	0.3	2	1.6		0.1
45-49	3	0.2		0.2	3	0.6	1	1.0	1	0.1
50-54	7	3.5	1	0.2		0.3		0.1		
55-59	5	7.5		0.2						
60-64	3	3.6								
65										
Totals	**18**	**14.8**	**1**	**0.7**	**4**	**1.5**	**8**	**8.1**	**9**	**5.3**

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, 2012 through June 30, 2017 (please see our report dated August 9, 2018. The actuarial assumptions represent estimates of future experience.

Economic Assumptions

The investment return rate used in making the valuation was 7.15% 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 7.15% investment return rate translates to an effective assumed real rate of return of 3.90%. The wage inflation assumption was revised for the June 30, 2015 valuation and the investment assumption was revised for the June 30, 2017 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, 2018 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-2006 Healthy Annuitant benefit weighted generational mortality tables for males and females. The disability post-retirement mortality tables used were the RP-2006 Disabled Retiree benefit weighted generational mortality tables for males and females. The death-in-service mortality tables used were the RP-2006 Employee benefit weighted generational mortality tables for males and females. Mortality rates are multiplied by 135% for males and 125% for females and are adjusted for fully generational mortality improvements using Scale MP-2017. This assumption was first used for the June 30, 2018 valuation.

The probabilities of retirement for members eligible to retire are shown on page D-4. The assumption was revised for the June 30, 2018 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, 2018 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
Based on the RP-2006 Healthy Annuitant
Generational Mortality Tables
And 7.15% Interest

Sample Attained Ages	Present Value of $1.00 Monthly for Life		Present Value of $1.00 Monthly for Life Increasing 3% Annually		Future Life Expectancy (Years) 2018 *	
	Men	Women	Men	Women	Men	Women
40	$ 155.86	$ 159.76	$ 228.83	$ 238.62	40.85	44.56
45	150.67	155.71	215.75	227.14	35.96	39.59
50	144.07	150.25	200.67	213.41	31.19	34.66
55	135.97	143.05	183.75	197.25	26.62	29.83
60	126.16	134.08	165.01	179.03	22.29	25.20
65	114.46	123.16	144.61	158.86	18.22	20.82
70	100.62	109.76	122.59	136.46	14.43	16.66
75	84.59	93.92	99.31	112.42	10.95	12.82
80	67.26	76.39	76.15	88.07	7.90	9.42
85	50.25	58.64	55.03	65.27	5.41	6.59

* *Applicable to calendar year 2018. Life expectancies and rates in future years are determined by the fully generational MP-2017 projection scale.*

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	1%	-		
48	1%	-		
49	1%	-		
50	6%	1%	30	25%
51	6%	1%	31	15%
52	8%	1%	32	15%
53	8%	6%	33	20%
54	8%	6%	34	35%
55	10%	25%	35	40%
56	10%	20%	36 & Over	100%
57	10%	18%		
58	25%	18%		
59	40%	20%		
60	50%	25%		
61	60%	30%		
62	80%	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: Death – Male	Death – Female	Disability	Other	Pay Increase Assumptions for Active Members: Merit & Seniority	Base (Economic)	Increase Next Year
20	0.05%	0.02%	0.06%	5.50%	4.50%	3.25%	7.75%
25	0.07%	0.02%	0.09%	5.50%	3.90%	3.25%	7.15%
30	0.07%	0.03%	0.19%	5.50%	2.90%	3.25%	6.15%
35	0.08%	0.04%	0.31%	4.18%	1.90%	3.25%	5.15%
40	0.09%	0.06%	0.43%	2.64%	1.38%	3.25%	4.63%
45	0.13%	0.08%	0.55%	1.43%	1.10%	3.25%	4.35%
50	0.23%	0.14%	0.67%	0.55%	0.80%	3.25%	4.05%
55	0.38%	0.22%	0.79%	0.00%	0.60%	3.25%	3.85%

Miscellaneous and Technical Assumptions
June 30, 2018

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:	It was assumed that members will participate in the forward DROP to the extent that participating in the forward DROP would provide the highest value of benefits.
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%.
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:

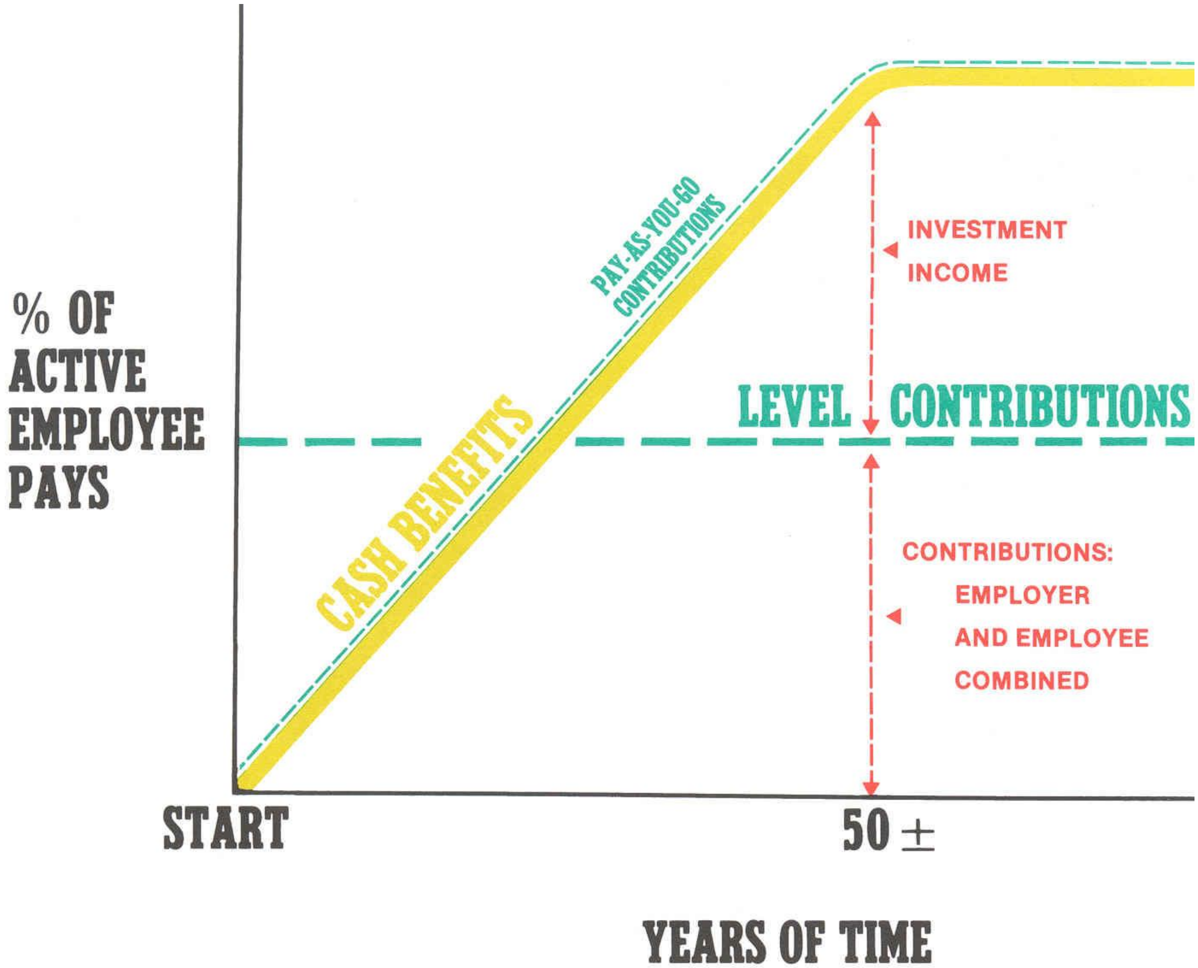
> Normal Cost (the cost of members' service being rendered this year)
> ... plus ...
> Interest on Unfunded Actuarial Accrued Liabilities (unfunded actuarial accrued liabilities are the difference between: the actuarial accrued liabilities for members' service already rendered; and the actuarial value 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)]
6/30/1999		$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%
6/30/2017		305.85	431.88	126.03	70.8%	29.08	433.4%
6/30/2017	@	305.85	429.05	123.21	71.3%	29.08	423.7%
6/30/2018		**319.79**	**442.93**	**123.14**	**72.2%**	**29.59**	**416.1%**

\# *After legislated changes in benefit provisions.*

@ *After changes in actuarial assumptions or methods.*

Schedule of Employer Contributions

Year Ended June 30	Annual Computed Contribution	Percent Contributed
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%
2017	14,122,584	141.34%
2018	**15,154,650**	**138.60%**

Supplementary Information

Valuation Date	June 30, 2018
Actuarial Cost Method	Entry Age Normal Cost
Amortization Method	Level Percent-of-Payroll
Remaining Amortization Period	21-year closed
Asset Valuation Method	4-year smoothed market
Actuarial Assumptions:	
Investment Rate of Return	7.15%
Projected Salary Increases	3.55% - 7.75%
Including Wage Inflation at	3.25%
Cost-of-Living Adjustments	3.0% Annual compound increases

Retirees and Beneficiaries Receiving Benefits	668
Terminated Plan Members Entitled to but not yet Receiving Benefits	84
DROP Members	61
Active Plan Members	467
Total	1,280

SECTION G

APPENDIX

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.

GRS Retirement Consulting

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November 9, 2018

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, 2018 Actuarial Valuation and the 2017/2018 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:bd
Enclosures