

Prescott Fire Dept. (023)
Arizona Public Safety Personnel
Retirement System
June 30, 2017





December 15, 2017

Board of Trustees
Arizona Public Safety Personnel Retirement System
Phoenix, Arizona

Re: Prescott Fire Dept.

The results of the June 30, 2017 annual actuarial valuation of members covered by the Arizona Public Safety Personnel Retirement System (PSPRS) are presented in this report.

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

The purpose of the valuation was to measure the Retirement System's funding progress and to determine the employer contribution for the 2018-2019 fiscal year. The funding objective is stated in Article 4, Chapter 5, Title 38, Section 843B of the Arizona Revised Statutes. In addition, this consolidated report provides summary information for PSPRS participating employers. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

The computed contribution rate shown on page A-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Given the importance of benefit security to any retirement system, we suggest that contributions to the System in excess of those presented in this report be considered.

The findings in this report are based on data and other information through June 30, 2017. 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. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

This valuation assumes the continuing ability of the participating employers to make the contributions necessary to fund this plan. A determination regarding whether or not the participating employers are actually able to do so is outside our scope of expertise. Consequently, we did not perform such an analysis.

The valuation was based upon information furnished by the Retirement System, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the Retirement System.

In addition, this report was prepared using certain assumptions approved by the Board as described in the section of this report entitled Methods and Assumptions.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the Arizona Public Safety Personnel Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board, and with applicable statutes.

Mark Buis, James D. Anderson and Francois Pieterse are Members of the American Academy of Actuaries (MAAA). These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY



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Executive Summary/Board Summary

1. Required Employer Contributions to Support Retirement Benefits

The computed employer contribution for the fiscal year beginning July 1, 2018 and funded status as of June 30, 2017 are shown below.

Tier 1 & Tier 2 Members:

Averages	Pension	Health	Total
Employer Contribution Rate	91.09%	0.00%	91.09%
Funded Status	33.2%	126.2%	34.5%

Tier 3 members (hired on or after July 1, 2017) – pension only:

- Employer contribution for Tier 3 benefits: 9.68%
- Employer contribution for Tier 1 and Tier 2 unfunded liability: 77.46%
- Total employer contribution as a percentage of Tier 3 payroll: 87.14%

2. Contribution Rate Comparison

The chart below compares the results for this valuation of the Retirement System with the results of the prior year's valuation:

Valuation Date	Tier 1 & 2			Tier 3*	
	Pension	Health	Total	Pension	Health
6/30/2016	91.61%	0.00%	91.61%	9.68%	0.26%
6/30/2017	91.09%	0.00%	91.09%	9.68%	0.26%

* Employer must also contribute 77.46% of Tier 3 payroll for pension Legacy UAL.

The pension contribution rate shown above increased from the June 30, 2016 valuation due to assumption changes, which impacted all employers. Certain employers lengthened the amortization period used for financing unfunded accrued liabilities which decreased the contribution rate in aggregate. In addition, those hired on or after July 1, 2017 (Tier 3) have a different level of benefit promise, which is financed on a 50/50 basis between Employer/Employee. Existing unfunded accrued liabilities are financed over all employer payroll (including Tier 3).

Executive Summary/Board Summary

3. Reasons for Change

Changes in the contribution rate are illustrated on the following chart. The impact of each change will be different for each employer.

Contribution Rate	Pension	Health	Total
Contribution Rate Last Valuation	91.61%	0.00%	91.61%
Asset Losses	0.30%	0.02%	0.32%
Tier 2	(0.40)%	(0.04)%	(0.44)%
Payroll Base	(7.34)%	0.04%	(7.30)%
PBI	0.69%	0.00%	0.69%
Benefit Changes	(0.49)%	0.00%	(0.49)%
Assumption Changes	7.15%	0.00%	7.15%
Amortization Method Change	0.00%	0.00%	0.00%
Other	(0.43)%	(0.02)%	(0.45)%
Contribution Rate This Valuation	91.09%	0.00%	91.09%

Funded Status	Pension	Health	Total
Funded Status Last Valuation	34.7%	126.5%	36.0%
Asset Losses	(0.1)%	(1.4)%	(0.1)%
Tier 2	0.0%	0.0%	0.0%
Payroll Base	(0.4)%	0.0%	(0.4)%
PBI	(0.2)%	0.0%	(0.2)%
Benefit Changes	(0.1)%	(0.5)%	(0.1)%
Assumption Changes	(1.2)%	0.0%	(1.3)%
Amortization Method Change	0.0%	0.0%	0.0%
Other	0.5%	1.6%	0.6%
Funded Status This Valuation	33.2%	126.2%	34.5%

Asset Losses – Asset losses are based on 7-year smoothing of assets. The return on market value was 12.0% for the year ending June 30, 2017. However, based on funding value, the average return for the last 7 years is approximately 6.6%

Executive Summary/Board Summary

Tier 2 – The decrease in the contribution rate is due to the fact that as current members retire, they are replaced by new members who have a less costly Tier of Benefits (for members hired on or after January 1, 2012). This will typically result in a declining normal cost rate that will occur gradually over time as the population mix (Tier 1 / Tier 2) changes. The effect of Tier 3 Members will first impact the June 30, 2018 valuation. Occasionally, the normal cost rate may change if there has been a shift in demographics during the year.

Payroll Base – Under the current amortization policy, the contribution rate is developed based on a percentage of payroll. To the extent that overall payroll is lower/greater than last year's payroll projected payroll growth, the contribution rate will increase/decrease as a result. For example, if there were two active members in the Plan last year and one of the members retired, the existing unfunded liability would now be spread over the payroll of one member instead of two members and the resulting contribution rate would be much higher. Therefore, it is important to consider the overall dollar level of the contribution along with the contribution rate. The dollar contributions are also shown on Page A-2. The change in the funded status is primarily due to gain or losses on the overall salary assumption, which includes both the wage base assumption and the merit and longevity components of the salary assumption.

PBI – Retroactive PBIs were paid due to resolution of the Hall case serving to increase the contribution rate and decrease the funded status in aggregate.

Benefit Changes – The benefit structure of PSPRS is summarized in Section F of this report. Changes in this valuation follow:

- Change in Tier 2 benefit eligibility and multiplier, and
- Tier 1 Employee contribution rates were decreased in accordance with Hall.

Looking ahead, the impact of the Tier 3 benefit changes will ultimately result in cost decreases (Normal Cost) that emerge gradually over time, as the percentage of the population covered by the new Tier grows.

Assumption Changes – For this valuation, the Board adopted the following assumption changes:

- Decrease the investment return assumption from 7.5% to 7.4%.
- Decrease the wage inflation assumption from 4.0% to 3.5%.
- Updated mortality to the RP-2014 tables, with 75% of MP-2016 fully generational projection scales.
- Updated withdrawal, disability and retirement assumptions.

Executive Summary/Board Summary

Amortization Method Changes – Some employers elected to extend the amortization period to 30 years either last year or this year. It is important to note that even if all assumptions are realized, including asset return at 7.4% per year -- under the 30 year level percent of payroll amortization method the unfunded liability is projected to grow for the next 10 years before declining (sometimes referred to as “negative amortization”).

Other – This is the combination of all factors other than those listed above and primarily reflects demographic gains and losses (i.e., service purchases, retirement, turnover, disability, etc. experience that differs from the actuarial assumptions).

4. Amortization Period

Unfunded liabilities were amortized as level percent-of-payroll over a closed period of 19 years. If the actuarial value of assets exceeded the actuarial accrued liability, the excess was amortized over an open period of 20 years and applied as a credit to reduce the normal cost which otherwise would be payable.

5. Looking Ahead

The continuing effect of prior asset losses was dampened by the 7-year smoothing period, and further offset by the effect of lower than expected pay increases. There remains unrecognized investment losses that will, in the absence of other gains, put upward pressure on the contribution rate next year.

If the June 30, 2017 pension valuation results were based on market value instead of smoothed funding value, the pension funded percent of the plan would be 32.2% (instead of 33.2%), and the pension employer contribution requirement would be 92.37% of payroll (instead of 91.09%).

6. Conclusion

The recent changes in benefit structure and actuarial assumptions increased contribution rates for most employers. For some employers, this was offset by lengthening the amortization period. Additionally, the changes to the historical PBI structure will help dampen the volatility of contribution rates in the future and provide more predictable benefit increases to retirees.

It is most important that this Plan receive contributions at least equal to the rates shown in this report.

SECTION A

INTRODUCTION

Funding Objective

The purpose of the annual actuarial valuation of the Arizona Public Safety Personnel Retirement System as of June 30, 2017 is to:

- Compute the liabilities associated with benefits likely to be paid on behalf of current retired and active members. This information is contained in Section B.
- Compare accrued assets with accrued liabilities to assess the funded condition. This information is contained in Section B.
- Compute the employers' recommended contribution rates for the Fiscal Year beginning July 1, 2018. This information is contained in Section A.

This objective is stated in Article 4, Chapter 5, Title 38, Section 843B of the Arizona Revised Statutes.

Contribution Rates

The Retirement System is supported by member contributions, employer contributions and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

- (1) Cover the actuarial present value of benefits allocated to the current year by the actuarial cost method described in Section E (the normal cost); and
- (2) Finance over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (the unfunded actuarial accrued liability).

Computed contribution rates for the fiscal year beginning July 1, 2018 are shown on pages A-2 and A-3.

Contribution Requirements

Development of Employer Contributions for the Indicated Valuation Date

Valuation Date	June 30, 2016		June 30, 2017	
Contribution for Fiscal Year ending	2018		2019	
TIERS 1 & 2 MEMBERS				
Pension	Rate	Dollar	Rate	Dollar
Normal Cost				
Service Pension	18.73%	\$ 717,528	17.47%	\$ 774,998
Disability Pension	1.66%	\$ 63,593	1.65%	\$ 73,197
Survivors of Active Members	0.80%	\$ 30,647	0.86%	\$ 38,151
Refund of Member Accumulated Contributions	1.36%	\$ 52,100	1.30%	\$ 57,670
Total Normal Cost	22.55%	\$ 863,869	21.28%	\$ 944,016
Total Employee Cost*	(7.65%)	\$ (293,064)	(7.65%)	\$ (339,367)
Employer Normal Cost	14.90%	\$ 570,805	13.63%	\$ 604,649
Employer Amortization of Unfunded Liabilities (Legacy)	76.71%	\$ 2,938,685	77.46%	\$ 3,436,253
Total Employer Cost (Pension)	91.61%	\$ 3,509,490	91.09%	\$ 4,040,902

* Tier 2 Members contribute 11.65%, but statutory requirements dictate only 7.65% is applied toward employer costs.

Health	Rate	Dollar	Rate	Dollar
Total Normal Cost	0.33%	\$ 12,642	0.31%	\$ 13,752
Employer Amortization of Unfunded Liabilities (Legacy)	(0.33%)	\$ (12,642)	(0.31%)	\$ (13,752)
Total Employer Cost (Health)	0.00%	\$ -	0.00%	\$ -

Tiers 1 & 2 Required Total Employer Cost (Pension + Health)	91.61%	\$ 3,509,490	91.09%	\$ 4,040,902
Total Minimum Contribution Requirement (if applicable)	0.00%		0.00%	
Alternate Contribution Rate (ACR)**	76.71%		77.46%	

** The Alternate Contribution Rate is the sum of the positive amortization payments for Tiers 1 & 2 Pension and Health, required for when retirees return to active status.

The results above are shown both prior to and after the application of the statutory minimum contribution requirement of 8% of payroll (5% of payroll if the actual employer contribution rate is less than 5% for the 2006/2007 Fiscal Year) and are based on the current amortization schedule approved by the Board of Trustees for your individual plan (see page E-1).

A.R.S. 38-843, subsection I allows for the employer to request a one-time increase in the amortization period up to a maximum of 30 years. The following costs are being provided to facilitate that decision. If the current approved amortization period on page E-1 is greater than those below, that request has already been made for this plan where the following is provided to facilitate earlier payoff, if desired.

	Rate	Dollar
Total Pension Employer Cost (25-year amortization)	78.44%	\$ 3,479,727
Total Pension Employer Cost (30-year amortization)	71.96%	\$ 3,192,264

Contribution Requirements

Development of Employer Contributions for the Indicated Valuation Date

Valuation Date	June 30, 2016	June 30, 2017
Contribution for Fiscal Year ending	2018	2019
TIER 3 MEMBERS - DEFINED BENEFIT (DB) PLAN		
Pension	Rate	Rate
Total Normal Cost	19.36%	19.36%
Amortization of Unfunded Liabilities	0.00%	0.00%
Total Pension Cost	19.36%	19.36%
Employee (EE) Pension Cost	9.68%	9.68%
Employer (ER) Pension Cost	9.68%	9.68%
Health	Rate	Rate
Total Normal Cost	0.52%	0.52%
Amortization of Unfunded Liabilities	0.00%	0.00%
Total Health Cost	0.52%	0.52%
Employee (EE) Health Cost	0.26%	0.26%
Employer (ER) Health Cost	0.26%	0.26%
Total Tier 3 Required EE/ER Individual Cost (before Legacy)	9.94%	9.94%
ER Legacy Cost of Tier 1 & 2 Amort of Unfunded Liabilities*	76.71%	77.46%
Total Tier 3 Required Employer Defined Benefit Cost	86.65%	87.40%
<i>Note: Due to Tier 3 beginning July 1, 2017, equivalent dollar amounts are not available until actual payroll data is experienced in order to provide accurate projections.</i>		
Defined Contribution (DC) Retirement Plan		
	Rate	Rate
Tiers 2 & 3 DB Member, Non-Soc Sec Participant - Employee**	3.00%	3.00%
Tiers 2 & 3 DB Member, Non-Soc Sec Participant - Employer**	3.00%	3.00%
<i>(Employer rate is 4% for Tier 2 members for a period of time depending on the individual's membership date.)</i>		
Tier 3 DC Only - Employee**	9.00%	9.00%
Tier 3 DC Only - Employee Disability Program***	1.55%	1.51%
Tier 3 DC Only - Total Employee	10.55%	10.51%
Tier 3 DC Only - Employer**	9.00%	9.00%
Tier 3 DC Only - Employer Disability Program***	1.55%	1.51%
Tier 3 DC Only - Total Employer (before Legacy)	10.55%	10.51%
Tier 3 DC Only - Employer Tier 1 & 2 Legacy Cost*	76.71%	77.46%
Tier 3 DC Only - Total Employer Cost	87.26%	87.97%

* Pursuant to A.R.S. 38-843, subsection B, the amortization of unfunded liabilities for Tiers 1 & 2 shall be applied to all Tier 3 payroll on a level percent basis. However, while it is statutorily required to present the rates in this manner, these are the minimums where alternate methods for paying down that unfunded liability is at the discretion of each employer. Further, to understand the effects of reform in relation to Tier 3, compare the total rate of Tier 3 before application of those legacy costs.

** Paid directly to third-party DC administrator, currently Nationwide

*** Paid directly to PSPRS along with the legacy cost

Impact of Extra Contributions

Extra Contribution in \$(000)	\$0	\$1,000	\$2,000	\$3,000	\$4,000	\$5,000	\$6,000	\$7,000	\$8,000	\$9,000	\$10,000
Impact on:											
- June 30, 2017 Funded Status	33.2%	34.7%	36.2%	37.8%	39.3%	40.8%	42.3%	43.8%	45.4%	46.9%	48.4%
- FYE 2019 Contribution Rate	91.09%	89.23%	87.37%	85.50%	83.64%	81.78%	79.91%	78.05%	76.19%	74.33%	72.46%

Based on the June 30, 2017 actuarial valuation, the table above shows the hypothetical change in the funded status and contribution rate due to each additional \$1,000,000 in market value.

Historical Summary of Employer Pension Rates (Tier 1 & 2)

Valuation Date June 30	Fiscal Year Ending June 30	Normal Cost	Unfunded Actuarial Accrued Liability	Total
2010	2012	11.46 %	18.26 %	29.72 %
2011	2013	11.48	22.44	33.92
2012	2014	12.41	31.06	43.47
2013	2015	11.91	47.75	59.66
2014* (before phase-in)	2016	11.37	55.23	66.60
2014* (after phase-in)	2016	11.37	49.44	60.81
2015 (before phase-in)	2017	11.02	64.75	75.77
2015 (after phase-in)	2017	11.02	58.80	69.82
2016	2018	14.90	76.71	91.61
2017	2019	13.63	77.46	91.09

* Beginning with the June 30, 2014 valuation the rates are for pension only.

Historical Summary of Employer Health Rates (Tier 1 & 2)

Valuation Date June 30	Fiscal Year Ending June 30	Normal Cost	Unfunded Actuarial Accrued Liability	Total
2014	2016	0.33 %	(0.33)%	0.00 %
2015	2017	0.32	(0.32)	0.00
2016	2018	0.33	(0.33)	0.00
2017	2019	0.31	(0.31)	0.00

SECTION B

FUNDING RESULTS

Present Value of Future Benefits and Accrued Liability

	<u>June 30, 2016</u>	<u>June 30, 2017</u>
Pension		
A. Accrued Liability		
1. For retirees and beneficiaries	\$ 44,046,691	\$ 48,144,597
2. For DROP members	4,807,297	3,982,742
3. For inactive/vested members	167,288	89,159
4. For present active members		
a. Value of expected future benefit paymen	20,087,745	22,602,813
b. Value of future normal costs	(6,339,910)	(6,904,383)
c. Active member accrued liability: (a) - (b)	13,747,835	15,698,430
5. Total accrued liability	62,769,111	67,914,928
B. Present Assets (Funding Value)	21,761,380	22,548,688
C. Unfunded Accrued Liability: (A.5) - (B)	41,007,731	45,366,240
D. Stabilization Reserve	-	-
E. Net Unfunded Accrued Liability: (C) + (D)	\$ 41,007,731	\$ 45,366,240
F. Funding Ratio: (B) / (A.5)	34.7%	33.2%
Health		
A. Accrued Liability		
1. For retirees and beneficiaries	\$ 453,425	\$ 509,207
2. For DROP members	98,248	71,694
3. For present active members		
a. Value of expected future benefit paymen	493,751	491,706
b. Value of future normal costs	(94,539)	(103,253)
c. Active member accrued liability: (a) - (b)	399,212	388,453
4. Total accrued liability	950,885	969,354
B. Present Assets (Funding Value)	1,202,932	1,223,799
C. Net Unfunded Accrued Liability: (A.4) - (B)	\$ (252,047)	\$ (254,445)
D. Funding Ratio: (B) / (A.4)	126.5%	126.2%

Pension Contribution Projection

Fiscal Year Ending June 30	Contribution Rate	Contribution Amount (Estimate)
2019	91.09 %	\$ 4,040,902
2020	91.45	4,198,863
2021	91.40	4,343,447
2022	91.48	4,499,402
2023	91.73	4,669,608
2024	91.81	4,837,259
2025	91.61	4,995,657
2026	91.59	5,169,376
2027	91.54	5,347,384
2028	91.53	5,533,937
2029	91.55	5,728,877

Contribution Amount estimated based on June 30, 2017 valuation data, methods, and assumptions, including 7.40% investment return and 3.50% payroll growth.

SECTION C

FUND ASSETS

Development of Pension Funding Value of Assets (7-Year Smoothing)

Year Ended June 30:	2017	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	\$ 6,553,902,958						
B. Market Value End of Year	6,841,326,541						
C. Market Value Beginning of Year	6,042,477,418						
D. Non Investment Net Cash Flow	70,983,479						
E. Investment Income							
E1. Total: B-C-D	727,865,644						
E2. Amount for Immediate Recognition: (7.50%)	494,204,602						
E3. Amount for Phased-in Recognition: E1-E2	233,661,042						
F. Phased-in Recognition of Investment Income							
F1. Current Year: E3 / 7	33,380,149						
F2. First Prior Year	(64,250,729)	\$ 33,380,149					
F3. Second Prior Year	(36,894,248)	(64,250,729)	\$ 33,380,149				
F4. Third Prior Year	33,458,496	(36,894,248)	(64,250,729)	\$ 33,380,149			
F5. Fourth Prior Year	9,542,555	33,458,496	(36,894,248)	(64,250,729)	\$ 33,380,149		
F6. Fifth Prior Year	(72,234,304)	9,542,555	33,458,496	(36,894,248)	(64,250,729)	\$ 33,380,149	
F7. Sixth Prior Year	40,557,031	(72,234,303)	9,542,556	33,458,496	(36,894,251)	(64,250,726)	\$ 33,380,148
F8. Total Recognized Investment Gain	(56,441,050)	(96,998,080)	(24,763,776)	(34,306,332)	(67,764,831)	(30,870,577)	33,380,148
G. Funding Value End of Year							
G1. Preliminary Funding Value End of Year: (A+D+E2+F1:F7)	7,062,649,989						
G2. Upper Corridor: (120% x B)	8,209,591,849						
G3. Lower Corridor: (80% x B)	5,473,061,233						
G4. End of Year: (G1 subject to max of G2 and min of G3)	7,062,649,989						
H. Difference Between Market Value & Funding Value: (B-G4)	(221,323,448)	(124,325,368)	(99,561,592)	(65,255,260)	2,509,571	33,380,148	0
I. Market Rate of Return	12.0%						
J. Recognized Rate of Return	6.6%						
K. Ratio of Funding Value to Market Value	103.2%						
L. Market Value of Assets for Division	21,842,076						
M. Funding Value of Assets for Division	22,548,688						

The funding value of assets recognizes assumed investment return (line E2) fully each year. Differences between actual and assumed investment return (line E3) are phased-in over a closed 7-year period. During periods when investment performance exceeds the assumed rate, funding value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, funding value of assets will tend to be greater than market value. The funding value of assets is **unbiased** with respect to market value. At any time it may be either greater or less than market value. If actual and assumed rates of investment return are exactly equal for 7 consecutive years, the funding value will become equal to market value.

Development of Health Funding Value of Assets (7-Year Smoothing)

Year Ended June 30:	2017	2018	2019	2020	2021	2022	2023
A. Funding Value Beginning of Year	\$ 324,351,993						
B. Market Value End of Year	321,261,466						
C. Market Value Beginning of Year	299,092,404						
D. Non Investment Net Cash Flow	(12,416,665)						
E. Investment Income							
E1. Total: B-C-D	34,585,727						
E2. Amount for Immediate Recognition: (7.50%)	23,860,775						
E3. Amount for Phased-in Recognition: E1-E2	10,724,952						
F. Phased-in Recognition of Investment Income							
F1. Current Year: E3 / 7	1,532,136						
F2. First Prior Year	(3,221,043)	\$ 1,532,136					
F3. Second Prior Year	(1,796,589)	(3,221,043)	\$ 1,532,136				
F4. Third Prior Year	1,653,381	(1,796,589)	(3,221,043)	\$ 1,532,136			
F5. Fourth Prior Year	451,741	1,653,381	(1,796,589)	(3,221,043)	\$ 1,532,136		
F6. Fifth Prior Year	(3,419,544)	451,741	1,653,381	(1,796,589)	(3,221,043)	\$ 1,532,136	
F7. Sixth Prior Year	1,919,954	(3,419,544)	451,740	1,653,381	(1,796,586)	(3,221,044)	\$ 1,532,136
F8. Total Recognized Investment Gain	(2,879,964)	(4,799,918)	(1,380,375)	(1,832,115)	(3,485,493)	(1,688,908)	1,532,136
G. Funding Value End of Year							
G1. Preliminary Funding Value End of Year: (A+D+E2+F1:F7)	332,916,139						
G2. Upper Corridor: (120% x B)	385,513,759						
G3. Lower Corridor: (80% x B)	257,009,173						
G4. End of Year: (G1 subject to max of G2 and min of G3)	332,916,139						
H. Difference Between Market Value & Funding Value: (B-G4)	(11,654,673)	(6,854,755)	(5,474,380)	(3,642,265)	(156,772)	1,532,136	0
I. Market Rate of Return	11.8%						
J. Recognized Rate of Return	6.6%						
K. Ratio of Funding Value to Market Value	103.6%						
L. Market Value of Assets for Division	1,180,956						
M. Funding Value of Assets for Division	1,223,799						

The funding value of assets recognizes assumed investment return (line E2) fully each year. Differences between actual and assumed investment return (line E3) are phased-in over a closed 7-year period. During periods when investment performance exceeds the assumed rate, funding value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, funding value of assets will tend to be greater than market value. The funding value of assets is **unbiased** with respect to market value. At any time it may be either greater or less than market value. If actual and assumed rates of investment return are exactly equal for 7 consecutive years, the funding value will become equal to market value.

SECTION D

CENSUS DATA

June 30, 2017 Valuation Data Summary

For purposes of the June 30, 2017 valuation, information on covered persons was furnished by the Board of Trustees. These people may be briefly described as follows.

	No.	Averages		
		Age	Service	Annual Pay or Retirement Allowance
Actives	56	38.8	10.7	\$73,950
Retirees & Beneficiaries	68			51,147
DROP	4			56,292
Inactive/Vested	6			
	134			

Active Members

**Members in Active Service as of June 30, 2017
by Years of Service**

Age	Years of Service							Total Count	Total Pay	Average Pay
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 & Up			
Under 25	3							3	\$ 158,708	\$ 52,903
25 - 29	6							6	295,985	49,331
30 - 34	4	3	2					9	575,932	63,992
35 - 39	3	3	2					8	490,732	61,342
40 - 44	1	1	5	7	1			15	1,229,225	81,948
45 - 49		1	1	5	2			9	812,124	90,236
50 - 54		1		1	2	1		5	447,441	89,488
55 - 59					1			1	131,060	131,060
60 - 64									0	0
65 and over									0	0
Total	17	9	10	13	6	1		56	\$ 4,141,207	\$ 73,950

Inactive/Vested Members

Inactive/Vested Members as of June 30, 2017
by Years of Service

Age	Years of Service					Total Count
	0 - 4	5 - 9	10 - 14	15 - 19	20 & Up	
Under 30	1					1
30 - 39	2					2
40 - 44	2	1				3
45 - 49						0
50 - 54						0
55 - 59						0
60 - 69						0
70 and over						0
Total	5	1	0	0	0	6

Retirees and Beneficiaries

All Retirants and Beneficiaries June 30, 2017 by Attained Ages

Attained Ages	Males		Females		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 25	0	\$ 0	0	\$ 0	0	\$ 0
25-29	0	0	2	97,706	2	97,706
30-34	0	0	3	176,105	3	176,105
35-39	0	0	4	243,262	4	243,262
40-44	1	35,286	1	101,483	2	136,769
45-49	1	37,359	0	0	1	37,359
50-54	5	228,167	1	37,233	6	265,400
55-59	8	419,506	1	36,760	9	456,266
60-64	16	876,366	1	41,094	17	917,460
65-69	12	625,295	1	41,176	13	666,471
70-74	6	292,785	0	0	6	292,785
75-79	1	44,967	1	34,007	2	78,974
80-84	0	0	2	70,992	2	70,992
85-89	0	0	0	0	0	0
90-94	0	0	1	38,467	1	38,467
95-99	0	0	0	0	0	0
100 and Over	0	0	0	0	0	0
Totals	50	\$ 2,559,731	18	\$ 918,285	68	\$ 3,478,016

Pension Being Paid		Number	Annual Pensions	Average Pensions
Retired Members	Service Pensions	45	\$ 2,323,858	\$51,641
	Disability Pensions	5	235,873	47,175
Totals		50	2,559,731	51,195
Survivors of Members	Spouses	18	918,285	51,016
	Children with Guardians	0	0	0
Total		18	918,285	51,016
Total Pension being Paid		68	\$3,478,016	\$51,147
		Average Age	Average Service	Average Age at Retirement
Normal Retired Members		62.6	23.1	50.9
Disability Retired Members		65.4	18.8	46.3
Spouse Beneficiaries		51.2	10.1	36.5

DROP Members

DROP Members as of June 30, 2017 by Attained Ages

Attained Ages	Males		Females		Total	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 45	0	\$ 0	0	\$ 0	0	\$ 0
45-49	0	0	0	0	0	0
50-54	2	90,748	0	0	2	90,748
55-59	2	134,420	0	0	2	134,420
60-64	0	0	0	0	0	0
65 and Over	0	0	0	0	0	0
Totals	4	\$225,168	0	\$0	4	\$225,168

Pension being Paid Historical Schedule

Valuation Date June 30	No.	Annual Pensions	% Incr. in Annual Pensions	Average Pension	Present Value of Pensions	
					Total	Average
2009	46	\$ 1,921,573	0.0 %	\$ 41,773	\$ 20,773,130	\$ 451,590
2010	49	2,140,029	11.4	43,674	23,047,556	470,358
2011	51	2,327,618	8.8	45,640	25,260,285	495,300
2012	55	2,629,353	13.0	47,806	29,378,451	534,154
2013	60	3,031,474	15.3	50,525	34,967,093	582,785
2014	63	3,234,859	6.7	51,347	42,131,604	668,756
2015	69	3,536,726	9.3	51,257	45,622,671	661,198
2016	70	3,583,333	1.3	51,190	48,853,988	697,914
2017	72	3,703,184	3.3	51,433	52,127,339	723,991

SECTION E

METHODS AND ASSUMPTIONS

Valuation Methods

Actuarial Cost Method - Normal cost and the allocation of benefit values between service rendered before and after the valuation date were determined using an individual entry-age actuarial cost method having the following characteristics:

- (i) the annual normal costs for each individual active member, payable from the date of hire to the date of retirement, are sufficient to accumulate to the value of the member's benefits.
- (ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

The entry-age actuarial cost method allocates the actuarial present value of each member's projected benefits on a level basis over the member's compensation between the entry age of the member and the assumed exit ages.

Actuarial Accrued Liability - The actuarial accrued liability is the portion of actuarial present value allocated to service rendered prior to the valuation date, including experience gains and losses. The actuarial accrued liability was computed using the assumptions summarized in this report.

Actuarial Value of System Assets - The actuarial value of assets recognizes assumed investment income fully each year. Differences between actual and assumed investment income are phased-in over a closed seven-year period subject to a 20% corridor. During periods when investment performance exceeds the assumed rate, actuarial value of assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, the actuarial value of assets will tend to be greater than market value.

Financing of Unfunded Actuarial Accrued Liabilities - The actuarial value of assets were subtracted from the computed actuarial accrued liability. Any unfunded amount would be amortized as level percent-of-payroll over a closed period of 19 years. If the actuarial value of assets exceeded the actuarial accrued liability, the excess was amortized over an open period of 20 years and applied as a credit to reduce the normal cost which otherwise would be payable.

Active member payroll was assumed to increase 3.5% annually for the purpose of computing the amortization payment (credit) as a level percent-of-payroll.

Valuation Methods

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

1. The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words, of transferring the obligations to a unrelated third party in an arm's length market value type transaction.
2. The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amount of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon actuarial assumptions. A funded ratio measurement in this report of 100% is not synonymous with no required future contributions. If the funded ratio 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.

Stabilization Reserve - Beginning with the June 30, 2007 valuation and with each subsequent valuation, if the actuarial value of assets exceeds the actuarial accrued liabilities, one half of this excess in each year is allocated to a Stabilization Reserve. The Stabilization Reserve is excluded from the calculation of the employer contribution rates. The Stabilization Reserve continues to accumulate as long as the plan is over-funded. Once the plan becomes under-funded, the Stabilization Reserve will be used to dampen increases in the employer contribution rates. With the June 30, 2017 valuation, the Plan is underfund and the Stabilization Reserve is zero.

Valuation Assumptions

Assumptions for this valuation are based on the most recent experience study performed in 2017. As experience emerges for Tier 3 members, separate assumptions may be developed that Tier.

The rate of investment return was 7.40% a year, compounded annually net of investment and administrative expenses.

The assumed real return is the rate of return in excess of wage growth. Considering other assumptions used in the valuation, the 7.40% nominal rate translates to a net real return over wage growth of 3.90% a year.

The rates of pay increase used for individual members are shown below. This assumption is used to project a member's current pay to the pay upon which System benefits will be based. This assumption was first used for the June 30, 2017 valuation of the System.

Salary Increase Assumptions for an Individual Member													
Sample Ages	Merit & Seniority						Base (Economy)	Increase Next Year					
	Maricopa County Police	Pima County Police	Other Police	Maricopa County Fire	Pima County Fire	Other Fire		Maricopa County Police	Pima County Police	Other Police	Maricopa County Fire	Pima County Fire	Other Fire
20	4.00%	4.00%	4.00%	4.00%	4.00%	3.70%	3.50%	7.50%	7.50%	7.50%	7.50%	7.50%	7.20%
25	3.64%	2.74%	3.10%	3.85%	2.86%	3.10%	3.50%	7.14%	6.24%	6.60%	7.35%	6.36%	6.60%
30	2.50%	1.66%	1.75%	3.24%	1.98%	2.10%	3.50%	6.00%	5.16%	5.25%	6.74%	5.48%	5.60%
35	1.27%	1.05%	0.65%	2.06%	1.33%	1.46%	3.50%	4.77%	4.55%	4.15%	5.56%	4.83%	4.96%
40	0.40%	0.39%	0.10%	0.96%	0.53%	0.94%	3.50%	3.90%	3.89%	3.60%	4.46%	4.03%	4.44%
45	0.04%	0.06%	0.00%	0.24%	0.10%	0.28%	3.50%	3.54%	3.56%	3.50%	3.74%	3.60%	3.78%
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
55	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
60	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%
65	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%	3.50%

The price inflation component of the investment return rate and the wage inflation rate is assumed to be 2.50%.

Valuation Assumptions

Mortality Tables. The mortality tables utilized are based upon the RP-2014 tables, as extended, and include a margin for future mortality improvement using a fully generational improvement scale. The tables used were as follows:

- **Healthy Pre-Retirement:** The RP-2014 Employee Mortality Tables, extended via cubic spline, projected backwards 1 year to 2013 with mortality improvement scale MP-2014. Future mortality improvements are assumed each year using 75% of scale MP-2016.
- **Healthy Post-Retirement:** The RP-2014 Healthy Annuitant Mortality Tables (110% for females), extended via cubic spline, projected backwards 1 year to 2013 with mortality improvement scale MP-2014. Future mortality improvements are assumed each year using 75% of scale MP-2016.
- **Disability Retirement:** The RP-2014 Disabled Mortality Tables, extended via cubic spline, projected backwards 1 year to 2013 with mortality improvement scale MP-2014. Future mortality improvements are assumed each year using 75% of scale MP-2016.

This assumption was first used for the June 30, 2017 valuation of the System.

Sample Ages in 2017	% Dying Next Year			
	Healthy Post-Retirement		Disability Retirement	
	Males	Females	Males	Females
40	0.1858%	0.1707%	1.2971%	0.6707%
45	0.2815%	0.2375%	1.7241%	0.9393%
50	0.4164%	0.3082%	2.0899%	1.2053%
55	0.5813%	0.4003%	2.3686%	1.4549%
60	0.7825%	0.5781%	2.6789%	1.7209%
65	1.1140%	0.9038%	3.2050%	2.1294%
70	1.7094%	1.4485%	4.1127%	2.8861%
75	2.7443%	2.3540%	5.5537%	4.1951%
80	4.5794%	3.9155%	7.8452%	6.2352%

Sample Ages in 2017	% Dying Next Year	
	Healthy Pre-Retirement	
	Males	Females
50	0.1382%	0.0558%
55	0.2261%	0.0841%
60	0.3777%	0.1236%
65	0.6698%	0.1887%

Valuation Assumptions

Mortality Tables (continued)

Sample Attained Ages	Healthy Post-Retirement		Healthy Pre-Retirement		Disabled Retirement	
	Future Life Expectancy (Years)*		Future Life Expectancy (Years)*		Future Life Expectancy (Years)*	
	Men	Women	Men	Women	Men	Women
55	29.39	31.04	32.91	41.11	21.11	25.01
60	24.95	26.39	28.02	36.03	18.20	21.47
65	20.68	21.95	23.34	31.02	15.34	18.03
70	16.66	17.76	18.96	26.10	12.59	14.71
75	12.96	13.90	14.89	21.32	10.01	11.66
80	9.65	10.44	11.19	16.73	7.67	9.01

* Based on retirements in 2017. Retirements in future years will reflect improvements in life expectancy.

Retirement/DROP Rates: Age-related rates for employees who were hired before January 1, 2012 are shown below, and was first used for the June 30, 2017 valuation of the System:

Age at Retirement	Rates					
	Maricopa County Police	Pima County Police	Other Police	Maricopa County Fire	Pima County Fire	Other Fire
62	60%	60%	60%	60%	60%	60%
63	50%	50%	50%	50%	50%	50%
64	50%	50%	50%	50%	50%	50%
65	50%	50%	50%	50%	50%	50%
66	50%	50%	50%	50%	50%	50%
67	50%	50%	50%	50%	50%	50%
68	50%	50%	50%	50%	50%	50%
69	50%	50%	50%	50%	50%	50%
70	100%	100%	100%	100%	100%	100%

These retirement rates are applicable to employees attaining age 62 before attaining 20 years of service.

Valuation Assumptions

Service-related rates for employees who were hired before January 1, 2012 are shown below:

Service at Retirement	Rates					
	Maricopa County Police	Pima County Police	Other Police	Maricopa County Fire	Pima County Fire	Other Fire
20	27%	24%	35%	14%	18%	23%
21	18%	19%	30%	14%	18%	18%
22	14%	14%	23%	7%	11%	11%
23	10%	10%	10%	7%	7%	8%
24	8%	7%	10%	7%	7%	5%
25	38%	32%	36%	22%	22%	30%
26	36%	32%	30%	26%	26%	30%
27	29%	22%	30%	19%	19%	30%
28	29%	22%	30%	32%	25%	25%
29	29%	22%	30%	30%	25%	16%
30	34%	35%	30%	30%	30%	32%
31	34%	35%	30%	30%	30%	35%
32	65%	65%	70%	55%	55%	60%
33	65%	65%	70%	55%	55%	60%
34	100%	100%	100%	100%	100%	100%

These retirement rates are applicable to employees attaining 20 years of service before attaining age 62.

Age-related rates for employees who were hired after January 1, 2012 are shown below:

Age at Retirement	Rates					
	Maricopa County Police	Pima County Police	Other Police	Maricopa County Fire	Pima County Fire	Other Fire
53	38%	32%	36%	22%	22%	30%
54	36%	32%	30%	26%	26%	30%
55	29%	22%	30%	19%	19%	30%
56	29%	22%	30%	32%	25%	25%
57	29%	22%	30%	30%	25%	16%
58	34%	35%	30%	30%	30%	32%
59	34%	35%	30%	30%	30%	35%
60	65%	65%	70%	55%	55%	60%
61	65%	65%	70%	55%	55%	60%
62	65%	65%	70%	55%	55%	60%
63	65%	65%	70%	55%	55%	60%
64	100%	100%	100%	100%	100%	100%

Valuation Assumptions

Rates of separation from active membership used in the valuation are shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment. This assumption was first used for the June 30, 2017 valuation of the System.

Sample Ages	Service Index	% of Active Members Separating within Next Year					
		Maricopa County Police	Pima County Police	Other Police	Maricopa County Fire	Pima County Fire	Other Fire
All	1	14.00%	16.00%	16.00%	7.00%	10.00%	9.50%
	2	8.50%	9.00%	12.50%	4.50%	5.00%	9.00%
	3	6.50%	7.50%	11.50%	3.70%	5.00%	7.50%
	4	4.50%	6.00%	9.00%	3.00%	4.00%	7.50%
	5	3.60%	6.00%	8.00%	2.50%	4.00%	6.50%
	6	3.30%	4.50%	8.00%	1.70%	3.50%	4.50%
	7	3.30%	4.50%	7.00%	1.70%	3.00%	4.00%
	8	3.30%	3.20%	7.00%	1.70%	2.40%	3.50%
	9	2.70%	3.20%	6.50%	1.70%	2.40%	3.50%
	10	2.70%	3.20%	6.00%	1.50%	2.40%	3.00%
	11	2.70%	3.20%	5.00%	1.10%	2.40%	2.70%
	12	1.80%	1.40%	4.00%	0.70%	1.00%	2.00%
	13	1.30%	1.40%	3.50%	0.70%	1.00%	2.00%
	14	1.30%	1.40%	3.00%	0.70%	1.00%	1.70%
	15	1.30%	1.00%	3.00%	0.60%	1.00%	1.20%
	16	0.70%	1.00%	2.00%	0.50%	1.00%	1.20%
	17	0.70%	1.00%	1.75%	0.50%	0.50%	1.20%
	18	0.70%	1.00%	1.75%	0.40%	0.50%	1.20%
	19	0.50%	1.00%	1.75%	0.40%	0.50%	1.20%
	20	0.50%	1.00%	1.75%	0.40%	0.50%	0.50%
21 & Over	0.50%	1.00%	1.75%	0.40%	0.50%	0.50%	

Valuation Assumptions

Rates of disability among active members used in the valuation are shown below, and were first used for the June 30, 2017 valuation of the System.

Sample Ages	% of Active Members Becoming Disabled within Next Year					
	Maricopa County Police	Pima County Police	Other Police	Maricopa County Fire	Pima County Fire	Other Fire
20	0.08%	0.08%	0.10%	0.03%	0.03%	0.03%
25	0.08%	0.08%	0.10%	0.03%	0.03%	0.03%
30	0.17%	0.16%	0.20%	0.04%	0.03%	0.03%
35	0.22%	0.21%	0.26%	0.09%	0.07%	0.08%
40	0.36%	0.35%	0.44%	0.17%	0.16%	0.17%
45	0.51%	0.49%	0.62%	0.17%	0.43%	0.48%
50	0.78%	0.75%	0.95%	0.43%	0.59%	0.65%
55	1.02%	0.98%	1.23%	1.00%	1.01%	1.13%

The Other Arizona Fire group assumptions were used for the Prescott Fire Dept. valuation.

Summary of Assumptions Used

June 30, 2017

Miscellaneous and Technical Assumptions

Marriage Assumption:	85% of males and 60% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Pay Increase Timing:	Six months after the valuation date. This means that the pays received are assumed to be annual rates of pay on the valuation date as opposed to W-2 type earnings for the prior 12 months.
Decrement Timing:	Decrements of all types 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 turnover decrements do not operate during retirement eligibility.
Service Credit Accruals:	It is assumed that members accrue one year of service credit per year.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.
Normal Form of Benefit:	A straight life payment is the assumed normal form of benefit for members who are not married, and the 80% Joint and Survivor form of payment with no reduction, for married members. 85% of males and 60% of females are assumed to be married at time of retirement.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Health Care Utilization:	70% of future retirees are expected to utilize retiree health care. 85% of males and 60% of females are assumed to be married.
Assumed Future Permanent Benefit Increases (PBI):	The cost-of-living adjustment will be based on the average annual percentage change in the Metropolitan Phoenix-Mesa Consumer Price Index published by the United States Department of Labor, Bureau of Statistics. We have assumed that to be 1.75% for this valuation.

Summary of Assumptions Used June 30, 2017

Miscellaneous and Technical Assumptions

**Financing of Unfunded
Actuarial Accrued Liabilities
(Money in the Pipes):**

The rate-setting valuation projects the unfunded actuarial accrued liability to the beginning of the applicable fiscal year to determine the applicable unfunded amortization rate.

Maintenance of Effort:

For Tier 1 & 2 members, the amount of member contributions that exceed 7.65% of the member's compensation will NOT be used to reduce the employer's contribution requirement. Therefore this Maintenance of Effort is subtracted from assets prior to calculating the contribution rate.

SECTION F

PLAN PROVISIONS

Summary of Plan Provisions Valued and/or Considered

Membership: Persons who are employed in an eligible group, prior to attaining age 65 years, for at least 40 hours a week for more than six months per year.

Average Monthly Benefit Compensation:

For members hired before January 1, 2012:

One-thirty-sixth of total compensation paid to member during the three consecutive years, out of the last 20 years of credited service, in which the amount paid was highest. Compensation is the amount including base salary, overtime pay, shift and military differential pay, compensatory time used in lieu of overtime pay, and holiday pay, paid to an employee on a regular payroll basis and longevity pay paid at least every six months for which contributions are made to the System.

For members hired on or after January 1, 2012 and before July 1, 2017:

One-sixtieth of total compensation paid to member during the five consecutive years, out of the last 20 years of credited service, in which the amount paid was highest. Compensation is the amount including base salary, overtime pay, shift and military differential pay, compensatory time used in lieu of overtime pay, and holiday pay, paid to an employee on a regular payroll basis and longevity pay paid at least every six months for which contributions are made to the System.

For members hired on or after July 1, 2017:

One-sixtieth of total compensation paid to member during the five consecutive years, out of the last 15 years of credited service, in which the amount paid was highest. Compensation is the amount including base salary, overtime pay, shift and military differential pay, compensatory time used in lieu of overtime pay, and holiday pay, paid to an employee on a regular payroll basis and longevity pay paid at least every six months for which contributions are made to the System.

Normal Retirement:

For members hired before January 1, 2012:

First day of month following completion of 20 years of service or following 62nd birthday and completion of 15 years of service.

The amount of monthly normal pension is based on credited service and average monthly compensation as follows:

- **For retirement with 25 or more years of credited service,** 50% of average monthly compensation for the first 20 years of credited service, plus 2.5% of average monthly compensation for each year of credited service above 20 years.
- **For retirement with 20 years of credited service but less than 25 years of credited service,** 50% of average monthly compensation for the first 20 years of credited service, plus 2% of average monthly compensation for each year of credited service between 20 and 25 years.
- **For retirement with less than 20 years of credited service,** the percent of average monthly compensation is reduced at a rate of 4% for each year less than 20 years of credited service.

The maximum amount payable as a normal retirement pension is 80% of the average monthly compensation.

Summary of Plan Provisions Valued and/or Considered

For members hired on or after January 1, 2012 and before July 1, 2017:

First day of month following the attainment of age 52.5 and completion of 25 years of service or first day of month following the attainment of age 52.5 and completion of 15 years of service.

The amount of monthly normal pension is based on credited service and average monthly compensation as follows:

- **For retirement with 15 years of credited service, but less than 17 years of credited service**, 1.5% of average monthly compensation for each credited year of service.
- **For retirement with 17 years of credited service, but less than 19 years of credited service**, 1.75% of average monthly compensation for each credited year of service.
- **For retirement with 19 years of credited service, but less than 22 years of credited service**, 2.0% of average monthly compensation for each credited year of service.
- **For retirement with 22 years of credited service, but less than 25 years of credited service**, 2.25% of average monthly compensation for each credited year of service.
- **For retirement with 25 years of service or more**, 62.5% of average monthly compensation for the first 25 years plus 2.5% of average monthly compensation for each year over 25 years of credited service.

The maximum amount payable as a normal retirement pension is 80% of the average monthly compensation.

For members hired on or after July 1, 2017:

First day of month following the attainment of age 55 and completion of 15 years of service.

The amount of monthly normal pension is based on credited service and average monthly compensation as follows:

- **For retirement with 15 years of credited service, but less than 17 years of credited service**, 1.5% of average monthly compensation for each credited year of service.
- **For retirement with 17 years of credited service, but less than 19 years of credited service**, 1.75% of average monthly compensation for each credited year of service.
- **For retirement with 19 years of credited service, but less than 22 years of credited service**, 2.0% of average monthly compensation for each credited year of service.
- **For retirement with 22 years of credited service, but less than 25 years of credited service**, 2.25% of average monthly compensation for each credited year of service.
- **For retirement with 25 or more years of credited service**, 2.5% of average monthly compensation for each credited year of service.

The maximum amount payable as a normal retirement pension is 80% of the average monthly compensation.

Summary of Plan Provisions Valued and/or Considered

Early Retirement:

For members hired before July 1, 2017:

Not eligible for an early retirement benefit.

For members hired on or after July 1, 2017:

Members who have earned at least 15 years of credited service may retire at age 52.5 and will receive a benefit that is actuarially equivalent to their normal retirement benefit.

Vested Termination (deferred retirement):

For members hired before January 1, 2012:

Termination of covered position employment with 10 or more years of credited service. Annuity is calculated based on twice the member's accumulated contributions with payments commencing at age 62. This annuity is not a retirement benefit and annuitants are not entitled to survivor benefits, benefit increases, or the group health insurance subsidy.

For members hired on or after January 1, 2012 and before July 1, 2017:

Termination of covered position employment with 25 or more years of credited service. Pension is payable if members leave contributions on account until reaching the age requirement. Pension is calculated in the same way as a normal retirement benefit. This annuity is a retirement benefit and annuitants are entitled to survivor benefits, benefit increases, and the group health insurance subsidy.

For members hired on or after July 1, 2017:

Termination of covered position employment with 15 or more years of credited service. Pension is payable if members leave contributions on account until reaching the age requirement. Pension is calculated in the same way as a normal retirement benefit. This annuity is a retirement benefit and annuitants are entitled to survivor benefits, benefit increases, and the group health insurance subsidy.

Refunds:

For members hired before January 1, 2012:

Member will receive a lump-sum payment of accumulated contribution. Benefit is forfeited if accumulated contributions are refunded. The following schedule shows additional money which would be payable to members who receive a refund of their accumulated member contributions.

<u>Years of Credited Service</u>	<u>Additional Monies (% of Contributions)</u>
0-4	0%
5-6	25-40
7-8	55-70
9-10	85-100

For members hired on or after January 1, 2012:

Member will receive a lump-sum payment of ONLY their accumulated contribution with interest at rate set by Board. Benefit is forfeited if accumulated contributions are refunded.

Summary of Plan Provisions Valued and/or Considered

Ordinary Disability Retirement (not duty-related): Physical condition which totally and permanently prevents performance of a reasonable range of duties or a mental condition which totally and permanently prevents any substantial gainful employment. The amount of pension is a percentage of normal pension on employee's credited service (maximum of 20 years divided by 20).

Accidental Disability Retirement (duty-related): Total and presumably permanent disability, incurred in performance of duty, preventing performance of a reasonable range of duties within the employee's job classification. No credited service requirement. Pension is computed in the same manner as normal pension based on credited service and average monthly compensation at time of termination of employment. Pension is 50% of average monthly compensation, or normal pension amount, whichever is greater.

Temporary Disability: Termination of employment prior to normal retirement eligibility by reason of temporary disability. Pension is 1/12 of 50% of compensation during the year preceding the date disability was incurred. Payments terminate after 12 months of prior recovery.

Catastrophic Disability: Pension is 90% of average monthly compensation. After 60 months, the pension is the greater of 62.5% of average monthly compensation or the member's accrued normal pension.

Survivor Pension: Death while a member is employed by an employer, or death after retirement. No credited service requirement.

Spouse Pension: 80% of pension deceased active member would have been paid for accidental disability retirement or, in the case of retired member, 80% of the retired member's pension. Requires two years of marriage*. Terminates upon death. For member killed in line of duty, 100% of average compensation, reduced by child's pension.

* If retired.

Child's Pension: 20% of the pension each month based on the calculation for an accidental disability retirement. Payable to a dependent child under age 18 or until age 23 if a full-time student.

Guardian's Pension: Same amount as spouse's pension. Payable only during periods no spouse is being paid and there is at least one child under age 18 or until age 23 if a full-time student. 80% of the member's pension and the child's pension will be paid to the guardian.

Other Termination of Employment: Member is paid his/her accumulated contributions.

Cost-of-Living Adjustment:

For members hired before July 1, 2017:

Each retired member or survivor of a retired member is eligible to receive a compounding cost-of-living adjustment in the base benefit. The first payment shall be made on July 1, 2018 and every July 1 thereafter.

Summary of Plan Provisions Valued and/or Considered

The cost-of-living adjustment will be based on the average annual percentage change in the Metropolitan Phoenix-Mesa Consumer Price Index published by the United States Department of Labor, Bureau of Statistics. The cost-of-living adjustment will not exceed 2% per year.

For members hired on or after July 1, 2017:

Each retired member or survivor of a retired member is eligible to receive a compounding cost-of-living adjustment in the base benefit, beginning at the earlier of the first calendar year after the 7th anniversary of the retired member’s retirement or when the retired member is or would have been sixty years of age.

A cost-of-living adjustment shall be paid on July 1 each year that the funded ratio for members hired on or after July 1, 2017 is 70% or more. The cost-of-living adjustment will be based on the average annual percentage change in the Metropolitan Phoenix-Mesa Consumer Price Index published by the United States Department of Labor, Bureau of Statistics. The cost-of-living adjustment will not exceed:

- 2%, if funded ratio for members who are hired on or after July 1, 2017 is 90% or more;
- 1.5%, if funded ratio for members who are hired on or after July 1, 2017 is 80-90%;
- 1%, if funded ratio for members who are hired on or after July 1, 2017 is 70-80%.

Post-Retirement Health Insurance Subsidy: Payable on behalf of retired members and survivors who elect coverage provided by the state or participating employer. The monthly amounts cannot exceed:

Member Only		With Dependents		
Not Medicare Eligible	Medicare Eligible	All Not Medicare Eligible	All Medicare Eligible	One with Medicare
\$150	\$100	\$260	\$170	\$215

Deferred Retirement Option Plan (DROP): A member hired before January 1, 2012 with 20 or more years of credited service under the System may enter into the DROP program with his employer. Under the DROP program, the member must voluntarily and irrevocably elect to enter into the program with his employer for a period of up to 60 months. During the DROP period, the member remains in the employ of the employer as a full-time paid Firefighter or full-time paid certified Peace Officer but no member or employer contributions are made to the System, therefore no additional years of credited service are accrued on the member’s behalf. The member’s monthly pension is calculated based upon the years of credited service and average monthly compensation at the beginning of the DROP period. This monthly pension amount is credited to a DROP participation account with interest credited monthly to the account. The interest rate credited to the DROP account is 8.0% for the fiscal year beginning July 1, 2011, 7.85% for the fiscal years beginning July 1, 2012, July 1, 2013 and July 1, 2014, 7.50% for the fiscal year beginning July 1, 2015 and 7.40% for the fiscal years beginning July 1, 2016 and July 1, 2017.

Summary of Plan Provisions Valued and/or Considered

At the end of the DROP period or prior to that time if the member terminates employment, the monies in the DROP participation account will be either paid to the member in a lump-sum amount or paid in a lump-sum distribution to an eligible retirement plan or individual retirement account. The member will then begin receiving the monthly pension amount directly from the System in the same amount as was being credited to the DROP participation account.

For members with less than 20 years of credited service on January 1, 2012, the monthly pension amount is credited to a DROP participation account with interest calculated as the average return on the actuarial value of assets, with a minimum of 2% and maximum equal to the actuarial assumed rate. The interest credited to the DROP account is 4.40% for the fiscal year beginning July 1, 2012, 3.20% for the fiscal year beginning July 1, 2013, 3.40% for the fiscal year beginning July 1, 2014, 3.1% for the fiscal year beginning July 1, 2015, 4.50% for the fiscal year beginning July 1, 2016 and 6.6% for the fiscal year beginning July 1, 2017.

For members with less than 20 years of credited service on January 1, 2012, during the DROP period, the member remains in the employ of the employer as a full-time paid Firefighter or full-time paid certified Peace Officer and refundable member contributions are made to the System.

A member hired on or after January 1, 2012 may NOT enter into the DROP.

Employer Contributions:

For members hired before July 1, 2017:

Percent-of-payroll normal cost plus 30-year (20 years remaining as of June 30, 2016) amortization of unfunded actuarial accrued liability (20-year amortization for credit). The statutory minimum is 8% of payroll (5% of payroll if the actual employer contribution rate is less than 5% for the 2006/2007 fiscal year). Employer will contribute to the system when members return to work.

For members hired on or after July 1, 2017:

50% of both the Normal Cost and Actuarially determined amount required to amortize the total unfunded liability for those hired after July 1, 2017. Each year a new amortization base for gains or losses, smoothed over a period not more than 5 years, will be created on a level dollar basis over a period equal to the average expected remaining service lives, but not more than 10 years.

Member Contributions:

For members hired before July 20, 2011: 7.65%

For members hired on or after July 20, 2011, but before January 1, 2012: 11.65%

For members hired on or after January 1, 2012, but before July 1, 2017: 11.65%

For members hired on or after July 1, 2017: 50% of both the Normal Cost and Actuarially determined amount required to amortize the total Tier 3 unfunded liability.

SECTION G

FUNDING POLICY

Actuarial Funding Policy

Introduction

The purpose of this Actuarial Funding Policy is to record the funding objectives and policy set by the Board for the Arizona Public Safety Personnel Retirement System (PSPRS). The Board establishes this Funding Policy to help ensure the systematic funding of future benefit payments for members of the Retirement System.

In 2012, the Governmental Accounting Standards Board (GASB) approved two new financial reporting standards. GASB Statement No. 67, "Financial Reporting for Pension Plans" replaces the requirements of Statement No. 25. GASB Statement No. 68, "Accounting and Financial Reporting for Pensions" replaces the requirements of Statements No. 27 and No. 50. Prior to the changes, the Annual Required Contribution (ARC) rate was used as a basis for funding decisions. The new GASB statements separate accounting cost (expense) from funding cost (contributions), necessitating the creation of this funding policy.

This funding policy shall be reviewed by the Board annually for several years following initial adoption until the next experience study. Subsequently, it shall be reviewed every five years in conjunction with the experience study.

Funding Objectives

1. Maintain adequate assets so that current plan assets plus future contributions and investment earnings are sufficient to fund all benefits expected to be paid to members and their beneficiaries.
2. Maintain stability of employer contribution rates, consistent with other funding objectives.
3. Maintain public policy goals of accountability and transparency. Each policy element is clear in intent and effect, and each should allow an assessment of whether, how and when the funding requirements of the plan will be met.
4. Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring those costs to future members and employers.
5. Provide a reasonable margin for adverse experience to help offset risks.
6. Continue progress of systematic reduction of the Unfunded Actuarial Accrued Liabilities (UAAL).

Actuarial Funding Policy

Elements of Actuarial Funding Policy

1. Actuarial Cost Method

- a. The Individual Entry Age Normal level percent of pay actuarial cost method of valuation shall be used in determining Actuarial Accrued Liability (AAL) and Normal Cost. Differences in the past between assumed experience and actual experience (“actuarial gains and losses”) shall become part of the AAL. The Normal Cost shall be determined on an individual basis for each active member.

2. Asset Smoothing Method

- a. The investment gains or losses of each valuation period, resulting from the difference between actual investment return and assumed investment return, shall be recognized annually in level amounts over 7 years in calculating the Funding Value of Assets
- b. The Funding Value of Assets so determined shall be subject to a 20% corridor relative to Market Value of Assets.

3. Amortization Method

- a. The Funding Value of Assets are subtracted from the computed AAL. Any unfunded amount is amortized as a level percent of payroll over a closed period. If the Funding Value of Assets exceeds the AAL, the excess is amortized over an open period of 20 years and applied as a credit to reduce the Normal Cost otherwise payable.

4. Funding Target

- a. The targeted funded ratio shall be 100%.
- b. The maximum amortization period shall be 30 years.
- c. If the funded ratio is between 100% and 120%, a minimum contribution equal to the Normal Cost will be made.

Actuarial Funding Policy

Elements of Actuarial Funding Policy (Concluded)

5. Risk Management

a. Assumption Changes

- The actuarial assumptions used shall be those last adopted by the PSPRS Board based on the most recent experience study and upon the advice and recommendation of the actuary. In accordance with best practices, the actuary shall conduct an experience study every five years. The results of the study shall be the basis for the actuarial assumption changes recommended to the PSPRS Board.
- The actuarial assumptions can be updated during the five-year period if significant plan design changes or other significant events occur, as advised by the actuary.

b. Amortization Method

- The amortization method, Level Percent Closed, will ensure full payment of the UAAL over a finite, systematically decreasing period not to exceed 30 years. The amortization period will be reviewed once the period reaches 15 years.

c. Risk Measures

- The following risk measures will be annually determined to provide quantifiable measurements of risk and their movement over time.
 - (i) Classic measures currently determined
 - Funded ratio (assets / liability)
 - (ii) UAAL / Total Payroll
 - Measures the risk associated with contribution decreases relative impact on the ability to fund the UAAL. An increase in this measure indicates a increase in contribution risk.
 - (iii) Total Liability / Total Payroll
 - Measures the risk associated with the ability to respond to liability experience through adjustments in contributions. An increase in this measure indicates an increase in experience risk.

Actuarial Funding Policy

Glossary

1. **Actuarial Accrued Liability (AAL):** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability”.
2. **Actuarial Assumptions:** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
3. **Actuarial Cost Method:** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method”.
4. **Actuarial Gain (Loss):** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. For example, if during a given year the assets earn more than the investment return assumption, the amount of earnings above the assumption will cause an unexpected reduction in UAAL, or “actuarial gain” as of the next valuation. These include contribution gains and losses that result from actual contributions made being greater or less than the level determined under the policy.
5. **Actuary:** A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries (MAAA). The Society of Actuaries (SOA) is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. The SOA administers a series of examinations leading initially to Associateship and the designation ASA and ultimately to Fellowship with the designation FSA.
6. **Amortization:** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
7. **Entry Age Normal Actuarial Cost Method:** A funding method that calculates the Normal Cost as a level percentage of pay over the working lifetime of the plan’s members.
8. **Experience Study:** An actuarial investigation of demographic and economic experiences of the system during the period studied. The investigation is made for the purpose of updating the actuarial assumptions used in valuing the actuarial liabilities.

Actuarial Funding Policy

Glossary (Concluded)

9. **Funding Value of Assets:** The value of current plan assets recognized for valuation purposes. Generally based on a phased-in recognition of all or a portion of market related investment return. Sometimes referred to as Actuarial Value of Assets.
10. **Market Value of Assets:** The fair value of plan assets as reported in the plan's audited financial statements.
11. **Normal Cost (NC):** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost". Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.
12. **Unfunded Actuarial Accrued Liability (UAAL):** The positive difference, if any, between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability".

APPENDIX A

ACCOUNTING DISCLOSURES

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.

Please note that Employer Reporting Information under GASB Statement No. 27 is being replaced by GASB Statement No. 68. Employers will receive a separate report for accounting disclosures under GASB Statement No. 68.

Schedule of Funding Progress (Excluding Health Insurance Subsidy Beginning June 30, 2008)

Year Ended June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a Percent of Covered Payroll [(b)-(a)]/(c)	AAL as a Percent of Covered Payroll (b)/(c)
2008	\$ 17,937,835	\$ 30,883,588	\$ 12,945,753	58.1 %	\$ 4,320,143	299.7 %	714.9 %
2009	18,741,981	31,054,176	12,312,195	60.4	4,080,036	301.8	761.1
2010	19,118,127	32,796,075	13,677,948	58.3	4,001,892	341.8	819.5
2011	19,864,483	36,064,123	16,199,640	55.1	4,099,794	395.1	879.7
2012	19,247,445	39,296,872	20,049,427	49.0	3,636,198	551.4	1080.7
2013	19,144,554	44,966,549	25,821,995	50.7	3,252,687	674.1	1382.4
2014	21,016,905	52,497,781	31,480,876	31.9	3,581,592	998.8	1465.8
2015	21,163,426	55,985,310	34,821,884	37.8	3,486,702	998.7	1605.7
2016	21,761,380	62,769,111	41,007,731	34.7	3,541,885	1157.8	1772.2
2017	22,548,688	67,914,928	45,366,240	33.2	4,141,207	1095.5	1640.0

Results before 2009 were calculated by the prior actuary.

Schedule of Employer Contributions

Fiscal Year Ended June 30	Annual Required Contribution
2010	\$ 1,187,079
2011	1,167,084 (est.)
2012	1,255,641 (est.)
2013	1,461,775 (est.)
2014	1,680,133 (est.)
2015	2,056,972 (est.)
2016*	2,579,984 (est.)
2017*	2,857,451 (est.)
2018	3,509,490 (est.)
2019	4,040,902 (est.)

** This is the estimated Annual Required Contribution before the phase-in plan.*

Fiscal Years prior to 2011 were provided by the prior actuary.

Beginning with the 2011 fiscal year, this schedule shows the estimated annual required contribution (calculated based on the recommended contribution rate and the projected payroll for the fiscal year). Actual amounts reported in the employer's financial statements may be different, due to differences between the projected payroll and the actual payroll during the fiscal year.

Supplementary Information

Summary of Actuarial Methods and Assumptions

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	June 30, 2017
Actuarial cost method	Entry Age Normal
Amortization method	Level percent of pay closed
Remaining amortization period	19 years for underfunded 20 years for overfunded
Asset valuation method	7-year smoothed market 80%/120% market

Actuarial assumptions:

Investment rate of return	7.40%
Projected salary increases	3.50% - 7.50%
Payroll growth	3.50%
Permanent Benefit Increases	The cost-of-living adjustment will be based on the average annual percentage change in the Metropolitan Phoenix-Mesa Consumer Price Index published by the United States Department of Labor, Bureau of Statistics. We have assumed that to be 1.75% for this valuation.

GASB Statement No. 45 Supplementary Information

The following information is presented concerning the post-retirement health insurance subsidy. The liabilities and computed contribution for the post-retirement health insurance subsidy were based on the same assumptions and actuarial cost methods as indicated for GASB Statement No. 27.

Schedule of Funding Progress

Valuation Date June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Annual Covered Payroll (c)	UAAL as a % of Covered Payroll ((b-a)/c)
2008	\$ 0	\$ 900,425	\$ 900,425	0.0 %	\$ 4,320,143	20.84%
2009	0	731,571	731,571	0.0	4,080,036	17.93
2010	0	793,901	793,901	0.0	4,001,892	19.84
2011	0	945,485	945,485	0.0	4,099,794	23.06
2012	0	850,856	850,856	0.0	3,636,198	23.40
2013	0	797,603	797,603	0.0	3,252,687	24.52
2014	1,083,850	856,616	(\$227,234)	126.5	3,581,592	0.00
2015	1,178,991	884,914	(\$294,077)	133.2	3,486,702	0.00
2016	1,202,932	950,885	(\$252,047)	126.5	3,541,885	0.00
2017	1,223,799	969,354	(\$254,445)	126.2	4,141,207	0.00

Annual Required Contribution

Valuation Date June 30	Fiscal Year Ended June 30	Normal Cost (a)	Actuarial Accrued Liability (b)	Total (a+b)	Dollar Amount
2008	2010	0.45%	1.01%	1.46%	\$ 63,074
2009	2011	0.53	0.87	1.40	63,577
2010	2012	0.53	1.00	1.53	68,149
2011	2013	0.34	1.24	1.58	71,416
2012	2014	0.32	1.24	1.56	62,539
2013	2015	0.34	1.41	1.75	62,160
2014	2016	0.33	(0.33)	0.00	0
2015	2017	0.32	(0.32)	0.00	0
2016	2018	0.33	(0.33)	0.00	0
2017	2019	0.31	(0.31)	0.00	0

Fiscal Years prior to 2011 were provided by the prior actuary.

Health Insurance Subsidy Payment Reported for FY2017: \$55,015