

**Arizona Public Safety Personnel  
Retirement System**

**Experience Study**

**July 1, 2001 through June 30, 2006**

April 6, 2007

The Fund Manager  
Arizona Public Safety Personnel Retirement System  
Phoenix, Arizona

This report contains the results of an Experience Study for the Arizona Public Safety Personnel Retirement System covering the period from July 1, 2001 through June 30, 2006.

The Experience Study was based upon the data submitted by the Retirement System for the annual actuarial valuations as of June 30, 2001, 2002, 2003, 2004, 2005 and 2006.

The results of the Experience Study are used in the process of selecting the actuarial assumptions to be used in the annual actuarial valuations of the Retirement System.

Respectfully submitted,



Sandra W. Rodwan  
Member, American Academy of  
Actuaries

CC: Mr. James Hacking, Administrator  
Arizona Public Safety Personnel  
Retirement System

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## ***Section One:***

### ***Introduction and Summary of Experience***

## **Purpose of the Experience Study**

The purpose of this Experience Study is to compile and analyze the actual demographic experience of the Retirement System. This information is then used in the process of determining the actuarial assumptions for the annual actuarial valuations of the Retirement System.

## **Period Covered by the Study**

This Experience Study covers the 5 year period from July 1, 2001 through June 30, 2006.

The demographic experience includes the following:

- Withdrawal rates
- Retirement rates (including Deferred Retirement Option Plan)
- Disability rates
- Mortality rates

The economic experience includes the following:

- Investment return rates
- Inflation rates
- Across-the-board salary increase rates

## **Organization of the Study**

For purposes of the actuarial valuations, the participating units have been divided into 4 assumption groups based on size. Generally larger, urban units have lower withdrawal rates than small, rural units.

The four assumption groups are:

- Police Large
- Police Small
- Fire Large
- Fire Small

The groups are listed beginning on page 30.

## **Summary of Results**

### **Withdrawal Rates**

**Police Large:** Higher rates than currently assumed in the first year of employment and in the younger ages after 5 years of service.

**Police Small:** Higher rates than currently assumed after 5 years of service.

**Fire Large:** Slightly higher rates than currently assumed in the younger ages after 5 years of service.

**Fire Small:** Higher rates than currently assumed after the first 2 years of service.

### **Retirement and Deferred Retirement Option Plan (DROP) Rates**

Rates of retirement not including DROP were less than currently assumed rates. With DROP, there was a significant increase in the overall rate of retirement, especially at 20, 25 and 32 years of service. Part of the increase may have been attributable to the fact that the DROP became effective at the beginning of experience study period, and was to be in effect for 5 years initially. We suggest that the rates of retirement and DROP be reviewed again in 3 to 5 years and adjusted if necessary based on emerging experience.

### **Disability Rates**

Generally higher rates than currently assumed for Police, and lower rates for Fire.

### **Mortality Rates**

Mortality rates were less than currently assumed, particularly for males, resulting in fewer deaths among both active and retired members than assumed.

### **Investment Return Rates**

Rates of recognized investment return based on the smoothed funding value of assets was less than currently assumed.

### **Inflation and Across-the-Board Salary Increase Rates**

Rates of inflation and across-the-board salary increases were less than currently assumed.



***Section Two:***  
***Withdrawal Rates***

## Withdrawal Rates – Police Large

<u>Age</u>	<u>Service</u>	<u>Withdrawals</u>		<u>Difference</u>	<u>Percent</u>
		<u>Actual</u>	<u>Expected</u>		<u>Withdrawing</u>
All	0<1	657	501	156	26.23%
	1<2	85	185	-100	3.90%
	2<3	82	66	16	3.75%
	3<4	62	55	7	2.79%
	4<5	48	45	3	2.14%
Under 20	5 and up	0	0	0	
20-24		0	0	0	
25-29		33	11	22	2.99%
30-34		124	51	73	2.43%
35-39		77	63	14	1.16%
40-44		38	48	-10	0.67%
45-49		18	28	-10	0.48%
50-54		10	12	-2	0.53%
55-59		2	3	-1	0.35%
60-64		0	1	-1	
65-69		0	0	0	
70 and Over		0	0	0	

## Current and Recommended Assumptions

<u>Ages</u>	<u>Service</u>	<u>Current</u>	<u>Recommended</u>	
ALL	0<1	20.00%	25.00%	
	1<2	8.50%	4.00%	
	2<3	3.00%	3.50%	
	3<4	2.50%	3.00%	
	4<5	2.00%	2.50%	
25	5 and up	1.00%	2.50%	
		30	1.00%	2.50%
		35	0.95%	1.60%
		40	0.85%	0.85%
		45	0.75%	0.60%
50	0.65%	0.50%		
55	0.55%	0.45%		
60	0.50%	0.00%		

## Withdrawal Rates – Police Small

<u>Age</u>	<u>Service</u>	<u>Withdrawals</u>		<u>Difference</u>	<u>Percent</u>
		<u>Actual</u>	<u>Expected</u>		<u>Withdrawing</u>
All	0<1	515	504	12	25.57%
	1<2	155	240	-85	9.70%
	2<3	142	112	30	9.47%
	3<4	97	108	-11	6.75%
	4<5	83	68	15	6.09%
Under 20	5 and up	0	0	0	
20-24		0	0	0	
25-29		43	14	29	7.48%
30-34		107	60	47	4.44%
35-39		111	69	42	3.80%
40-44		64	52	12	2.60%
45-49		25	29	-4	1.62%
50-54		15	14	1	1.84%
55-59		11	7	4	2.88%
60-64		0	2	-2	
65-69		0	0	0	
70 and Over		0	0	0	

## Current and Recommended Assumptions

<u>Ages</u>	<u>Service</u>	<u>Current</u>	<u>Recommended</u>
ALL	0<1	25.00%	25.00%
	1<2	15.00%	10.00%
	2<3	7.50%	9.00%
	3<4	7.00%	7.00%
	4<5	5.00%	6.00%
25	5 and up	2.50%	6.00%
30		2.50%	6.00%
35		2.35%	4.00%
40		2.10%	3.00%
45		1.85%	2.00%
50		1.75%	2.00%
55		1.75%	2.00%
60		1.75%	2.00%

## Withdrawal Rates – Fire Large

<u>Age</u>	<u>Service</u>	<u>Withdrawals</u>		<u>Difference</u>	<u>Percent</u>
		<u>Actual</u>	<u>Expected</u>		<u>Withdrawing</u>
All	0<1	40	51	-11	6.22%
	1<2	7	16	-9	1.30%
	2<3	4	11	-7	0.71%
	3<4	6	6	0	0.97%
	4<5	6	4	2	0.93%
Under 20	5 and up	0	0	0	
20-24		0	0	0	
25-29		2	2	0	0.63%
30-34		8	5	3	0.63%
35-39		8	7	1	0.41%
40-44		3	8	-5	0.11%
45-49		5	4	1	0.23%
50-54		0	1	-1	
55-59		0	0	0	
60-64		0	0	0	
65-69		0	0	0	
70 and Over		0	0	0	

## Current and Recommended Assumptions

<u>Ages</u>	<u>Service</u>	<u>Current</u>	<u>Recommended</u>
ALL	0<1	8.00%	7.00%
	1<2	3.00%	1.50%
	2<3	2.00%	1.00%
	3<4	1.00%	1.00%
	4<5	0.60%	1.00%
25	5 and up	0.60%	0.70%
30		0.40%	0.60%
35		0.35%	0.50%
40		0.30%	0.30%
45		0.20%	0.20%
50		0.10%	0.20%
55		0.10%	0.00%
60		0.10%	0.00%

## Withdrawal Rates – Fire Small

<u>Age</u>	<u>Service</u>	<u>Withdrawals</u>		<u>Difference</u>	<u>Percent</u>
		<u>Actual</u>	<u>Expected</u>		<u>Withdrawing</u>
All	0<1	90	124	-34	7.23%
	1<2	71	83	-12	5.96%
	2<3	50	40	10	4.99%
	3<4	42	39	3	4.32%
	4<5	42	35	7	4.85%
Under 20	5 and up	0	0	0	
20-24		0	0	0	
25-29		16	9	7	4.64%
30-34		42	30	12	3.50%
35-39		28	27	1	1.78%
40-44		24	24	0	1.49%
45-49		10	17	-7	0.88%
50-54		3	7	-4	0.63%
55-59		1	2	-1	0.75%
60-64		0	0	0	
65-69		0	0	0	
70 and Over		0	0	0	

## Current and Recommended Assumptions

<u>Ages</u>	<u>Service</u>	<u>Current</u>	<u>Recommended</u>
ALL	0<1	10.00%	8.00%
	1<2	7.00%	6.00%
	2<3	4.00%	5.00%
	3<4	4.00%	5.00%
	4<5	4.00%	5.00%
25	5 and up	2.50%	5.00%
30		2.50%	4.00%
35		1.70%	3.00%
40		1.50%	1.60%
45		1.50%	1.20%
50		1.50%	0.70%
55		1.50%	0.70%
60		1.50%	0.70%



***Section Three:***

***Retirement and Deferred Retirement  
Option Plan Rates***

## Retirement Rates – Police Large

### Excluding DROP

<u>Service</u>	<u>Retirements</u>			<u>Percent Retiring</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
20	150	364	(214)	16.5%
21	38	91	(53)	6.7%
22	26	79	(53)	5.3%
23	23	74	(51)	4.9%
24	16	23	(7)	3.5%
25	74	193	(119)	15.3%
26	32	51	(19)	9.4%
27	37	45	(8)	16.5%
28	22	49	(27)	13.5%
29	11	59	(48)	9.3%
30	15	67	(52)	16.8%
31	14	44	(30)	24.1%
32	19	39	(20)	36.9%
33	9	11	(2)	64.3%
34	5	3	2	100.0%
35	1	2	(1)	50.0%
36	2	3	(1)	44.4%
37	1	0	1	100.0%
38	2	1	1	100.0%
39	1	1	0	100.0%
40	0	1	(1)	
Over 40	1	0	1	100.0%

### Including DROP

<u>Service</u>	<u>Retirements</u>			<u>Percent Retiring</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
20	368	364	4	40.5%
21	104	91	13	18.3%
22	81	79	2	16.4%
23	59	74	(15)	12.7%
24	30	23	7	6.5%
25	340	193	147	70.5%
26	121	51	70	35.4%
27	108	45	63	48.1%
28	81	49	32	49.7%
29	67	59	8	56.5%
30	60	67	(7)	67.0%
31	43	44	(1)	74.1%
32	52	39	13	100.0%
33	13	11	3	92.9%
34	5	3	2	100.0%
35	4	2	3	100.0%
36	3	3	(0)	66.7%
37	1	0	1	100.0%
38	2	1	1	100.0%
39	1	1	0	100.0%
40	0	1	(1)	
Over 40	1	0	1	100.0%

## Retirement Rates – Police Small

### Excluding DROP

<u>Service</u>	<u>Retirements</u>			<u>Percent Retiring</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
20	148	113	35	32.9%
21	36	23	13	15.9%
22	20	14	6	14.6%
23	10	10	0	10.2%
24	10	5	5	10.9%
25	27	23	4	29.3%
26	9	7	2	13.3%
27	9	4	5	24.7%
28	6	4	2	22.2%
29	2	4	(2)	9.1%
30	3	2	1	15.4%
31	1	1	(0)	7.7%
32	5	5	0	62.5%
33	1	3	(2)	22.2%
34	2	0	2	100.0%
35	0	0	0	
36	0	0	0	
37	0	0	0	
38	0	0	0	
39	0	0	0	
40	0	0	0	
Over 40	0	0	0	

### Including DROP

<u>Service</u>	<u>Retirements</u>			<u>Percent Retiring</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
20	270	113	157	59.9%
21	56	23	33	24.8%
22	35	14	21	25.5%
23	17	10	7	17.3%
24	13	5	8	14.1%
25	67	23	44	72.8%
26	21	7	14	31.1%
27	14	4	10	38.4%
28	13	4	9	48.1%
29	4	4	(0)	18.2%
30	6	2	4	30.8%
31	4	1	3	30.8%
32	9	5	4	100.0%
33	3	3	(0)	66.7%
34	2	0	2	100.0%
35	0	0	0	
36	0	0	0	
37	0	0	0	
38	0	0	0	
39	0	0	0	
40	0	0	0	
Over 40	0	0	0	

## Retirement Rates – Fire Large

<u>Excluding DROP</u>					<u>Including DROP</u>				
<u>Service</u>	<u>Retirements</u>		<u>Difference</u>	<u>Percent Retiring</u>	<u>Service</u>	<u>Retirements</u>		<u>Difference</u>	<u>Percent Retiring</u>
	<u>Actual</u>	<u>Expected</u>				<u>Actual</u>	<u>Expected</u>		
20	16	147	(131)	3.3%	20	80	147	(67)	16.3%
21	7	37	(30)	1.9%	21	41	37	4	11.0%
22	6	50	(44)	1.8%	22	28	50	(22)	8.4%
23	7	33	(26)	2.1%	23	18	33	(15)	5.5%
24	6	31	(25)	1.9%	24	9	31	(22)	2.9%
25	32	115	(83)	11.1%	25	173	115	58	60.2%
26	16	36	(20)	6.6%	26	81	36	45	33.6%
27	7	35	(28)	4.0%	27	39	35	4	22.0%
28	13	45	(32)	8.6%	28	74	45	29	49.0%
29	14	52	(38)	13.6%	29	44	52	(8)	42.7%
30	14	47	(33)	22.4%	30	37	47	(10)	59.2%
31	6	37	(31)	12.2%	31	22	37	(15)	44.9%
32	9	22	(13)	30.5%	32	27	22	5	91.5%
33	11	8	3	100.0%	33	14	8	6	100.0%
34	2	5	(3)	28.6%	34	6	5	1	85.7%
35	3	4	(1)	60.0%	35	4	4	0	80.0%
36	2	1	1	100.0%	36	3	1	2	100.0%
37	2	2	0	80.0%	37	3	2	1	100.0%
38	0	0	0		38	0	0	0	
39	0	0	0		39	0	0	0	
40	0	0	0		40	0	0	0	
Over 40	0	1	(1)		Over 40	1	1	1	100.0%

## Retirement Rates – Fire Small

<u>Excluding DROP</u>					<u>Including DROP</u>				
<u>Service</u>	<u>Retirements</u>		<u>Difference</u>	<u>Percent Retiring</u>	<u>Service</u>	<u>Retirements</u>		<u>Difference</u>	<u>Percent Retiring</u>
	<u>Actual</u>	<u>Expected</u>				<u>Actual</u>	<u>Expected</u>		
20	34	20	14	16.7%	20	61	20	41	30.0%
21	10	5	5	7.4%	21	19	5	14	14.0%
22	4	4	(0)	3.9%	22	12	4	8	11.8%
23	6	4	2	7.2%	23	11	4	7	13.2%
24	3	4	(1)	4.2%	24	7	4	3	9.8%
25	3	11	(8)	4.2%	25	27	11	16	38.0%
26	3	5	(2)	5.4%	26	10	5	5	18.0%
27	2	2	0	6.6%	27	8	2	6	26.2%
28	1	1	0	6.3%	28	7	1	6	43.8%
29	1	1	0	10.0%	29	3	1	2	30.0%
30	1	1	(0)	11.8%	30	3	1	2	35.3%
31	0	1	(1)		31	0	1	(1)	
32	0	2	(2)		32	2	2	1	44.4%
33	1	1	0	40.0%	33	1	1	0	40.0%
34	0	1	(1)		34	0	1	(1)	0.0%
35	0	1	(1)		35	0	1	(1)	0.0%
36	1	0	1	100.0%	36	1	0	1	100.0%
37	0	0	0		37	0	0	0	
38	0	0	0		38	0	0	0	
39	0	0	0		39	0	0	0	
40	0	0	0		40	0	0	0	
Over 40	0	0	0		Over 40	0	0	0	

## Retirement and DROP Recommendations – Police Large

<b>Total Retirement/DROP Rate Assumptions</b>		
<u>Service</u>	<u>Current</u>	<u>Recommended</u>
20	40%	40%
21	16	16
22	16	15
23	16	10
24	5	5
25	40	65
26	15	30
27	20	45
28	30	45
29	50	50
30	75	60
31	75	70
32	75	100
33	75	
34	75	
35	75	
36	75	
37	75	
38	75	
39	75	

## Retirement and DROP Recommendations – Police Small

<u>Service</u>	<u>Total Retirement /Drop Rate Assumptions</u>	
	<u>Current</u>	<u>Recommended</u>
20	25%	50%
21	10	20
22	10	20
23	10	17
24	5	14
25	25	65
26	10	25
27	10	35
28	15	45
29	20	20
30	10	30
31	10	30
32	60	100
33	75	
34	75	
35	75	
36	75	
37	75	
38	75	
39	75	

## Retirement and DROP Recommendations – Fire Large

<u>Service</u>	<u>Total Retirement/DROP Rate Assumptions</u>	
	<u>Current</u>	<u>Recommended</u>
20	30%	15%
21	10	10
22	15	8
23	10	5
24	10	3
25	40	55
26	15	30
27	20	20
28	30	45
29	50	45
30	75	60
31	75	40
32	75	90
33	75	100
34	75	
35	75	
36	75	
37	75	
38	75	
39	75	

## Retirement and DROP Recommendations – Fire Small

<u>Service</u>	<u>Total Retirement/DROP Rate Assumptions</u>	
	<u>Current</u>	<u>Recommended</u>
20	15%	30%
21	5	14
22	5	12
23	5	12
24	5	10
25	20	35
26	15	15
27	10	25
28	10	40
29	10	30
30	20	35
31	25	35
32	60	35
33	75	100
34	75	
35	75	
36	75	
37	75	
38	75	
39	75	



***Section Four:***  
***Disability Rates***

## Disability Rates – Police Large

<u>Age</u>	<u>Disabilities</u>		<u>Difference</u>	<u>Percent Disabled</u>
	<u>Actual</u>	<u>Expected</u>		
Under 20	0	0	0	
20-24	2	0	2	
25-29	8	8	0	0.14%
30-34	21	13	8	0.25%
35-39	23	19	4	0.29%
40-44	35	21	14	0.56%
45-49	27	21	6	0.69%
50-54	23	16	7	1.17%
55-59	8	9	-1	1.33%
60-64	2	3	-1	1.51%
65-69	0	0	0	
70 and Over	0	0	0	

## Current and Recommended Assumptions

<u>Ages</u>	<u>Current</u>	<u>Recommended</u>
25	0.15%	0.10%
30	0.16	0.21
35	0.23	0.27
40	0.34	0.45
45	0.52	0.64
50	0.83	0.98
55	1.45	1.27
60	2.00	1.44

## Disability Rates – Police Small

<u>Age</u>	<u>Disabilities</u>			<u>Percent Disabled</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
Under 20	0	0	0	
20-24	0	0	0	
25-29	6	5	1	0.18%
30-34	17	8	9	0.36%
35-39	14	9	5	0.35%
40-44	22	10	12	0.72%
45-49	15	9	6	0.83%
50-54	15	8	7	1.61%
55-59	11	6	5	2.51%
60-64	1	2	-1	1.04%
65-69	0	0	0	
70 and Over	0	0	0	

## Current and Recommended Assumptions

<u>Ages</u>	<u>Current</u>	<u>Recommended</u>
25	0.15%	0.15%
30	0.16	0.29
35	0.23	0.35
40	0.34	0.57
45	0.52	0.79
50	0.83	1.30
55	1.45	2.00
60	2.00	2.00

## Disability Rates – Fire Large

<u>Age</u>	<u>Disabilities</u>			<u>Percent Disabled</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
Under 20	0	0	0	
20-24	0	0	0	
25-29	0	2	-2	
30-34	2	3	-1	0.09%
35-39	3	4	-1	0.13%
40-44	7	8	-1	0.24%
45-49	4	9	-5	0.18%
50-54	9	6	3	0.98%
55-59	3	2	1	1.75%
60-64	2	0	2	30.77%
65-69	0	0	0	
70 and Over	0	0	0	

## Current and Recommended Assumption

<u>Ages</u>	<u>Current</u>	<u>Recommended</u>
25	0.12%	0.03%
30	0.13	0.05
35	0.18	0.11
40	0.27	0.20
45	0.42	0.20
50	0.66	0.66
55	1.16	1.44
60	1.60	2.00

## Disability Rates – Fire Small

<u>Age</u>	<u>Disabilities</u>		<u>Difference</u>	<u>Percent Disabled</u>
	<u>Actual</u>	<u>Expected</u>		
Under 20	0	0	0	
20-24	0	0	0	
25-29	1	3	-2	0.05%
30-34	1	4	-3	0.04%
35-39	3	5	-2	0.13%
40-44	5	6	-1	0.25%
45-49	10	6	4	0.75%
50-54	2	4	-2	0.37%
55-59	4	2	2	2.69%
60-64	0	0	0	
65-69	0	0	0	
70 and Over	0	0	0	

## Current and Recommended Assumption

<u>Ages</u>	<u>Current</u>	<u>Recommended</u>
25	0.14%	0.04%
30	0.14%	0.04
35	0.21%	0.09
40	0.31%	0.20
45	0.47%	0.55
50	0.75%	0.55
55	1.30%	1.70
60	1.80%	2.00



***Section Five***  
***Mortality Rates***

## Active Member Mortality Rates -- Total

<u>Age</u>	<u>Deaths</u>			<u>Percent Died</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
Under 20	0	0	0	
20-24	4	0	4	
25-29	7	6	1	0.06%
30-34	11	12	-1	0.06%
35-39	9	16	-7	0.05%
40-44	16	19	-3	0.11%
45-49	12	22	-10	0.13%
50-54	13	19	-6	0.30%
55-59	7	10	-3	0.51%
60-64	4	3	1	1.53%
65-69	0	0	0	
70 and Over	0	0	0	

## Retiree Mortality -- Total

<u>Age</u>	<u>Deaths</u>			<u>Percent Died</u>
	<u>Actual</u>	<u>Expected</u>	<u>Difference</u>	
Under 20	0	0	0	
20-24	2	0	2	8.00%
25-29	0	0	0	0.00%
30-34	1	0	1	0.65%
35-39	0	0	0	
40-44	0	1	-1	
45-49	5	5	0	0.17%
50-54	12	29	-17	0.22%
55-59	25	42	-17	0.38%
60-64	38	49	-11	0.74%
65-69	44	57	-13	1.22%
70-74	49	69	-20	1.82%
75-79	44	63	-19	2.94%
80-84	44	52	-8	5.75%
85-89	44	40	4	12.26%
90-94	11	22	-11	8.73%
95-99	7	6	1	25.00%
Over 100	0	0	0	

## Retiree Mortality – By Sex

Male					Female				
Age	Deaths			Percent Died	Age	Deaths			Percent Died
	Actual	Expected	Difference			Actual	Expected	Difference	
Under 20	0	0	0		Under 20	0	0	0	
20-24	0	0	0		20-24	2	0	2	12.50%
25-29	0	0	0		25-29	0	0	0	
30-34	1	0	1	1.32%	30-34	0	0	0	
35-39	0	0	0		35-39	0	0	0	
40-44	0	2	-2		40-44	0	0	0	
45-49	4	9	-5	0.16%	45-49	1	1	0	0.19%
50-54	11	30	-19	0.23%	50-54	1	2	-1	0.16%
55-59	22	56	-34	0.37%	55-59	3	3	0	0.50%
60-64	35	65	-30	0.78%	60-64	3	5	-2	0.50%
65-69	39	74	-35	1.27%	65-69	5	7	-2	0.96%
70-74	39	85	-46	1.84%	70-74	10	13	-3	1.76%
75-79	35	64	-29	3.33%	75-79	9	16	-7	2.01%
80-84	30	42	-12	6.83%	80-84	14	19	-5	4.29%
85-89	28	23	5	16.97%	85-89	16	17	-1	8.25%
90-94	4	9	-5	8.33%	90-94	7	10	-3	8.97%
95-99	1	1	0	20.00%	95-99	6	4	2	26.09%
Over 100	0	0	0		Over 100	0	0	0	

## Mortality Assumptions

The current mortality table for non-disabilities is the 1971 Group Annuity Mortality Table Projected to 2000 (Male), female ages set back six years.

The Society of Actuaries has published a newer table, RP-2000, based on a study of nearly 11 million life-years of exposure and more than 190,000 deaths from 100 uninsured pension plans. The Society of Actuaries committee responsible for the study determined that this volume of data was sufficient to produce valid mortality tables.

Compared with the mortality assumptions currently used for the Arizona Public Safety Personnel Retirement System, the RP-2000 table has lower rates of mortality for males and slightly higher rates for females.

### Recommendation:

We suggest that the Fund Manager consider adopting the RP-2000 mortality table for purposes of the annual actuarial valuation of the Retirement System, set ahead 5 years for disabilities.

The table below shows a comparison of life expectancies based on the present table and the RP-2000 table. Note that life expectancies are shown for illustration purposes. The actuarial valuation process uses the mortality rates at each age, not life expectancies.

Sample Ages	Future Life Expectancy (Years)			
	Current Assumption		Recommended	
	Males	Females	Males	Females
20	56.86	62.72	59.04	62.53
25	51.98	57.83	54.15	57.59
30	47.12	52.95	49.25	52.65
35	42.29	48.09	44.38	47.34
40	37.51	43.25	39.57	42.86
45	32.80	38.46	34.79	38.03
50	28.28	33.73	30.07	33.27
55	23.98	29.17	25.86	28.69
60	19.90	24.82	21.64	24.27
65	16.09	20.70	17.62	20.13
70	12.69	16.82	13.92	16.27
75	9.82	13.32	10.61	12.78
80	7.39	10.36	7.79	9.72
85	5.57	7.83	5.54	7.13
90	4.19	5.89	3.90	5.20

We suggest that the mortality experience be reviewed again in 3 to 5 years. If the actual mortality rates continue to be less than assumed, we recommend that the RP 2000 table be projected to reflect the less than assumed mortality.



## ***Section Six***

### ***Economic Assumptions***

## Economic Assumptions

The economic assumptions include the rate of investment return, inflation, across-the-board salary increases and the real rates of return over inflation and across-the-board salary increases.

The current economic assumptions used for the Retirement System are as follows:

Investment Return	8.5%
Inflation	5.0%
Across-the-Board Salary Increases	0.5%
Real Rates of Return (Net of Expenses)	
-Over Inflation	3.5%
-Over Across-the-Board Salary Increases	3.0%

## Inflation Experience

The following table shows the rates of inflation (as measured by the Consumer Price Index) over the period of the Experience Study.

<b>Year Ended June 30</b>	<b>Increase in CPI-U</b>	<b>Assumed Inflation</b>
2002	1.1%	5.0%
2003	2.1	5.0
2004	3.3	5.0
2005	2.5	5.0
2006	4.3	5.0

Over the period of the Experience Study, inflation rates were less than the assumed 5.0% rate.

## Average Salary Increases Compared to Assumed Increases

Year Ended June 30	Increase in Average Salary*	Assumed Across-the-Board Salary Increases		
		Inflation	Other	Total
2002	2.8%	5.0%	0.5%	5.5%
2003	3.3	5.0	0.5	5.5
2004	1.4	5.0	0.5	5.5
2005	3.9	5.0	0.5	5.5
2006	3.7	5.0	0.5	5.5

\*Based on average of salary submitted for the annual actuarial valuations.

Over the period of the Experience Study, the increases in average salary were less than the assumed increases (approximately 3% average annual increase over the period of the Study). Over the past 30 years the annual increase in average salaries has averaged approximately 4.5%.

## Nominal Rates of Investment Return

The following table shows the nominal rates of investment return based upon the smoothed market value of assets. These nominal rates of return based on the smoothed market value are of use for the actuarial valuation, but are not to be used to compare investment performance with other retirement plans or benchmarks. The actual market value returns reported by the investment counselor should be used for that purpose.

Actuarial Valuation as of June 30	Nominal Rate of Return (Smoothed Asset Value)	Assumed Rate of Return (Net of Expenses)
2002	(1.14)%	9.00%
2003	3.14	9.00
2004	3.47	8.75
2005	3.11	8.50
2006	2.74	8.50

## Real Rates of Return

Annual Valuation June 30	Real Rate of Return Over		Assumed Real Rate of Return Over	
	Inflation	Increase in Average Salary	Inflation	Across-The Board Salary Increases
2002	(2.24)%	(3.94)%	3.5%	3.0%
2003	1.04	(0.16)	3.5	3.0
2004	0.17	2.07	3.5	3.0
2005	0.61	(0.79)	3.5	3.0
2006	(1.56)	(0.96)	3.5	3.0

### Comments

The smoothed market value of assets used for valuation purposes recognized investment income at the assumed rate and spreads the difference between the actual and assumed investment return over a 7 year period. The period was increased to 7 years from 4 years beginning with the June 30, 2003 valuation, as adopted by the Fund Manager.

If the actual economic experience is less favorable than assumed (i.e. lower investment income than assumed, greater inflation and salary increases than assumed), contribution rates will rise as the negative experience develops. Carry-forwards of negative experience from prior years are likely to result in experience losses in the next several years in the absence of very favorable investment returns.

### Recommendation

As with all of the assumptions, the economic assumptions need to be based on the long-term expected experience, not simply the rates from the 5 year experience study. The asset allocation of the Fund and the risk tolerance of the Fund Manager must be taken into consideration.

The Fund Manager should consult with its investment advisor regarding the potential returns given the asset allocation. If economic experience is expected to be less favorable than currently assumed over the long term, this should be reflected in the economic assumptions (e.g. a decrease in the assumed rate of investment return) to avoid long-term increases in funding requirements.



## ***Section Seven***

### ***Summary of Recommended Rates***

## Demographic Assumptions

*Non-Disability Mortality rates:* RP 2000 Healthy Annuitants

*Disability Mortality Rates:* RP 2000 Healthy Annuitants, set forward 5 years.

Sample Ages	Non-Disability Table		Disability Table	
	Future Life Expectancy (Years)		Future Life Expectancy (Years)	
	Men	Women	Men	Women
20	59.04	62.53	54.15	57.59
25	54.15	57.59	49.25	52.65
30	49.25	52.65	44.38	47.34
35	44.38	47.34	39.57	42.86
40	39.57	42.86	34.79	38.03
45	34.79	38.03	30.07	33.27
50	30.07	33.27	25.86	28.69
55	25.86	28.69	21.64	24.27
60	21.64	24.27	17.62	20.13
65	17.62	20.13	13.92	16.27
70	13.92	16.27	10.61	12.78
75	10.61	12.78	7.79	9.72
80	7.79	9.72	5.54	7.13
85	5.54	7.13	3.90	5.20
90	3.90	5.20	2.88	4.02

**Termination of Employment:** Service-related rates for first five years of employment and age-related rates after first five years of employment. The sample rates are as follows:

Sample Ages	Years of Service	Percent Terminating Within Next Year				Disability			
		Police		Fire		Police		Fire	
		Large	Small	Large	Small	Large	Small	Large	Small
ALL	0	25.00%	25.00%	7.00%	8.00%				
	1	4.00	10.00	1.50	6.00				
	2	3.50	9.00	1.00	5.00				
	3	3.00	7.00	1.00	5.00				
	4	2.50	6.00	1.60	5.00				
25	5 and over	2.50	6.00	0.70	5.00	0.10%	0.15%	0.03%	0.04%
30		2.50	6.00	0.60	4.00	0.21	0.29	0.05	0.04
35		1.60	4.00	0.50	3.00	0.27	0.35	0.11	0.09
40		0.85	3.00	0.30	1.60	0.45	0.57	0.20	0.20
45		0.60	2.00	0.20	1.20	0.64	0.79	0.20	0.55
50		0.50	2.00	0.20	0.70	0.98	1.30	0.66	0.55
55		0.45	2.00	0.00	0.70	1.27	2.00	1.44	1.70
60		0.00	2.00	0.00	0.70	1.44	2.00	2.00	2.00

**Retirement Rates:** Service-related rates based on the following schedule:

Service	Percent of Active Members Retiring and DROPing in Year of Attaining Indicated Service			
	Police Large	Police Small	Fire Large	Fire Small
20	40%	50%	15%	30%
21	16	20	10	14
22	15	20	8	12
23	10	17	5	12
24	5	14	3	10
25	65	65	55	35
26	30	25	30	15
27	45	35	20	25
28	45	45	45	40
29	50	20	45	30
30	60	30	60	35
31	70	30	40	35
32	100	100	90	35
33			100	100
34				
35				

## Economic Assumptions

The assumed rate of investment return (net of expenses) currently adopted by the Fund Manager for the annual actuarial valuations is 8.50% per annum, compounded annually.

The assumed rate of across-the-board salary increases currently adopted by the Fund Manager for the annual actuarial valuations is 5.5%, including 5.0% for inflation.

We understand that the Fund Manager is working with investment advisors regarding asset allocation and potential returns. If economic experience is expected to be less favorable than currently assumed over the long term, this should be reflected in the economic assumptions to avoid long-term increases in funding requirements.

## Large Groups

ASU Campus Police  
Dept. of Public Safety  
Douglas Fire Fighters  
Flagstaff Fire Fighters  
Game & Fish Department  
Glendale Fire Fighters  
Maricopa Sheriffs

Mesa Fire Fighters  
Mesa Police  
Phoenix Fire Fighters  
Phoenix Police  
Pima Sheriffs  
Pinal County Sheriffs  
Scottsdale Police

Tempe Fire Fighters  
Tucson Fire Fighters  
Tucson Police  
Winslow Fire Fighters  
Yuma Fire Fighters  
Yuma Police  
Yuma Sheriffs

## Small Groups

Ak Chin Indian Community Fire  
Ak Chin Indian Community Police  
Apache County Sheriffs  
Apache Junction Fire District  
Apache Junction Police  
Arizona Attorney General Investigators  
Arizona Department of Liquor Licenses  
Arizona State Capitol Police  
Arizona State Parks  
Avondale Fire Fighters  
Avondale Police  
Avra Valley Fire District  
Benson Police  
Bisbee Fire Fighters  
Bisbee Police  
Black Canyon Fire District  
Buckeye Fire Fighters  
Buckeye Police  
Buckeye Valley Fire District  
Buckskin Fire Fighters  
Bullhead City Fire Fighters  
Bullhead City Police  
Camp Verde Fire District  
Camp Verde Marshals  
Casa Grande Fire Fighters  
Casa Grande Police  
Cave Creek Marshals  
Central Yavapai Fire Fighters  
Chandler Fire Fighters  
Chandler Police

Gilbert Police  
Glendale Police  
Globe Fire Fighters  
Globe Police  
Golden Shores Fire District  
Golden Valley Fire District  
Golder Ranch Fire District  
Goodyear Fire Fighters  
Goodyear Police  
Graham County Attorney Investigators  
Graham County Sheriffs  
Green Valley Fire District  
Greenlee County Attorney Investigators  
Greenlee County Sheriffs  
Guadalupe Fire Fighters  
Hayden Police  
Heber-Overgaard Fire Fighters  
Highlands Fire District  
Holbrook Police  
Hualapai Indian Tribe Police Dept.  
Hualapai Valley Fire Fighters  
Jerome Police Department  
Kearny Police  
Kingman Fire Fighters  
Kingman Police  
La Paz County Attorney Investigators  
La Paz County Sheriffs  
Lake Havasu City Fire Fighters  
Lake Havasu City Police  
Lakeside Fire Fighters

Pine-Strawberry Fire Fighters  
Pinetop Fire Fighters  
Pinetop-Lakeside Police  
Pinewood Fire District  
Prescott Fire Fighters  
Prescott Police  
Prescott Valley Police  
Quartzsite Fire District  
Quartzsite Police Department  
Rincon Valley Fire District  
Rio Rico Fire District  
Rio Verde Fire District  
Safford Police  
Sahuarita Police  
Salt River Pima-Maricopa Fire Fighters  
Salt River Pima-Maricopa Police  
San Luis Fire Fighters  
San Luis Police  
Santa Cruz County Sheriffs  
Scottsdale Fire  
Sedona Fire District  
Sedona Police  
Show Low Fire Fighters  
Show Low Police  
Sierra Vista Fire Fighters  
Sierra Vista Police  
Snowflake Police  
Somerton Fire Fighters  
Somerton Police  
South Tucson Fire Fighters

### Small Groups (Continued)

Chino Valley Fire District	Linden Fire District	South Tucson Police
Chino Valley Police	Mammoth Police	Springerville Police
Clarksdale Police	Marana Police	St. John's Police
Clifton Fire Fighters	Maricopa County Attorney Investigators	Summit Fire District
Clifton Police	Maricopa County Park Rangers	Sun City Fire Fighters
Cochise County Sheriffs	Maricopa Fire District	Sun City West Fire District
Coconino County Sheriffs	Mayer Fire District	Sun Lakes Fire District
Coolidge Police	Miami Fire Fighters	Superior Fire
Corona De Tucson Fire District	Miami Police	Superior Police
Cottonwood Fire Fighters	Mohave County Sheriffs	Surprise Fire Fighters
Cottonwood Police	Mohave Valley Fire Fighters	Surprise Police
D.E.M.A.	Montezuma/Rimrock Fire Fighters	Tempe Police
Daisy Mountain Fire District	NAU Police	Thatcher Police
Diamond Star Fire Fighters	Navajo County Attorney Investigators	Three Points Fire District
Douglas Police	Navajo County Sheriffs	Tolleson Fire Fighters
Drexel Heights Fire Fighters	Nogales Fire Fighters	Tolleson Police
Eagar Police	Nogales Police	Tombstone Marshals
El Mirage Fire Fighters	Northwest Fire District	Tonopah Fire District
El Mirage Police	Oro Valley Police	Tri-City Fire District
Eloy Fire District	Page Fire Fighters	Tubac Fire District
Eloy Police	Page Police	Tucson Airport Authority Fire Fighters
Flagstaff Police	Paradise Valley Police	Tucson Airport Authority Police
Florence Fire Fighters	Parker Police	U of A Police
Florence Police	Pascua-Yaqui Tribal Fire	Verde Valley Fire District
Fort McDowell Tribal Fire Department	Pascua-Yaqui Tribal Police	Wellton Police
Fort McDowell Tribal Police Department	Patagonia Marshals	Wickenburg Fire
Fort Mohave Mesa Fire District	Payson Fire Fighters	Wickenburg Police
Fort Mojave Tribal Police	Payson Police	Willcox Police
Fredonia Marshals	Peoria Fire Fighters	Williams Police
Fry Fire Fighters	Peoria Police	Winslow Fire Fighters
Gila County Sheriffs	Picture Rocks Fire Fighters	Winslow Police
Gila River Fire Fighters	Pima Community College Police	Yavapai County Attorney Investigators
Gila River Police	Pima County Attorney Investigators	Yavapai County Sheriffs
Gilbert Fire Fighters	Pima Police	Youngtown Police