

Arizona Corrections Officer Retirement Plan

Experience Study

July 1, 2001 through June 30, 2006

April 9, 2007

The Fund Manager
Arizona Corrections Officer Retirement Plan
Phoenix, Arizona

This report contains the results of an Experience Study for the Arizona Corrections Officer Retirement Plan covering the period from July 1, 2001 through June 30, 2006.

The Experience Study was based upon the data submitted by the Retirement Plan 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 Plan.

Respectfully submitted,



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Member, American Academy of
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CC: Mr. James Hacking, Administrator
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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 Plan. This information is then used in the process of determining the actuarial assumptions for the annual actuarial valuations of the Retirement Plan.

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
- Disability rates
- Mortality rates

The economic experience includes the following:

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

Summary of Results

Withdrawal Rates

Withdrawal rates were tabulated separately for Corrections Officers and Dispatchers. During the first 5 years of service both groups had more turnover than currently assumed. After 5 years of service Corrections Officers exhibited more turnover than currently assumed until age 45. There is minimal experience for Dispatchers with 5 or more years of service, but the withdrawal rates were generally less than assumed after age 40.

Retirement Rates

Currently assumed rates of retirement are based on age. We tabulated the experience by age, and additionally by service. The rates of retirement at 20 and 25 years of service were significantly greater than the 25% rates currently assumed for retirements before age 60. The recommended rates reflect this, moderated somewhat by the likelihood that the rates over the period of the experience study may have been skewed because 20 year retirement eligibility was effective for Correction Officers in August, 2001, the start of the experience study period. (Dispatchers are not eligible for 20 years of service at any age prior to age 60). Future actuarial rates may be impacted by the Reverse DROP provision in effect from July 1, 2006 through June 30, 2011.

Disability Rates

Disability rates were less than currently assumed. The recommended rates were not reduced pending legislation which may expand disability coverage.

Mortality Rates

There were more deaths than assumed for active members younger than age 40 and fewer than assumed for active members older than age 40.

For retired lives, there were more deaths than assumed for those younger than 60, and fewer than assumed after age 60. Overall, males had fewer deaths than expected (244 v. 278), while females had more deaths than expected (91 v. 64) based on the current assumptions.

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 – Corrections Officer

<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	3,704	2,874	830	38.67%
	1<2	2,145	1,801	344	29.78%
	2<3	1,480	1,166	314	25.38%
	3<4	1,020	715	305	21.41%
	4<5	696	471	225	17.72%
Under 20	5 and up	0	0	0	
20-24		16	0	16	62.75%
25-29		252	100	152	17.83%
30-34		500	253	247	13.99%
35-39		341	275	66	8.74%
40-44		276	250	26	6.71%
45-49		179	221	-42	4.92%
50-54		166	163	3	5.15%
55-59		132	129	3	5.18%
60-64		78	63	15	6.28%
65-69		10	0	10	4.27%
70 and Over		1	0	1	3.17%

Current and Recommended Assumptions

<u>Age</u>	<u>Service</u>	<u>Current</u>	<u>Recommended</u>
ALL	0<1	30.00%	30.00%
	1<2	25.00	30.00
	2<3	20.00	25.00
	3<4	15.00	20.00
	4<5	12.00	15.00
25	5 and up	7.00	15.00
30		7.00	10.00
35		7.00	10.00
40		6.00	7.50
45		6.00	5.50
50		5.00	5.00
55		5.00	5.00
60		5.00	5.00

Withdrawal Rates – Dispatchers

<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	110	97	13	33.95%
	1<2	49	52	-3	23.61%
	2<3	38	27	11	28.25%
	3<4	18	12	6	21.82%
	4<5	13	9	4	17.93%
Under 20	5 and up	0	0	0	
20-24		0	0	0	
25-29		2	2	0	5.19%
30-34		4	3	1	7.27%
35-39		6	4	2	11.65%
40-44		1	3	-2	1.44%
45-49		2	4	-2	3.05%
50-54		2	3	-1	3.81%
55-59		2	3	-1	5.06%
60-64		2	2	0	1.00%
65-69		1	0	1	13.33%
70 and Over		0	0	0	

Current and Recommended Assumptions

<u>Age</u>	<u>Service</u>	<u>Current</u>	<u>Recommended</u>
ALL	0<1	30.00%	30.00%
	1<2	25.00	25.00
	2<3	20.00	20.00
	3<4	15.00	20.00
	4<5	12.00	15.00
25	5 and up	7.00	7.00
30		7.00	7.00
35		7.00	7.00
40		6.00	6.00
45		6.00	4.00
50		5.00	3.50
55		5.00	3.00
60		5.00	3.00



Section Three:
Retirement Rates

Retirement Rates – Based on Age

<u>Age</u>	<u>Retirements</u>		<u>Difference</u>	<u>Percent Retiring</u>
	<u>Actual</u>	<u>Expected</u>		
35-39	5	0	5	100.0%
40-44	77	55	22	35.2%
45	28	25	3	28.0%
46	24	25	(1)	23.9%
47	30	27	3	27.9%
48	35	29	6	30.6%
49	20	30	(10)	16.5%
50	40	30	10	32.9%
51	33	26	7	31.4%
52	38	31	7	31.0%
53	30	28	2	26.9%
54	41	30	11	33.7%
55	37	31	6	30.2%
56	33	26	7	31.9%
57	29	25	4	28.9%
58	18	21	(3)	21.3%
59	27	18	9	36.7%
60	29	22	7	40.0%
61	38	16	22	71.7%
62	157	97	60	65.0%
63	38	47	(9)	32.3%
64	23	33	(10)	27.7%
65	78	71	8	100.0%

Retirement Rates – Based on Service

<u>Service</u>	<u>Retirements Actual</u>	<u>Percent Retiring</u>
20	301	68.5%
21	80	31.4%
22	43	22.5%
23	51	31.9%
24	27	19.8%
25	61	67.0%
26	21	38.9%
27	16	49.2%
28	5	22.7%
29	5	34.5%
30	2	20.0%
31	1	13.3%
32	3	120.0%
33	2	133.3%

Retirement Rate Recommendations

<u>Current—Age Related</u>		<u>Recommended—Service Related</u>	
<u>Age</u>	<u>Percent Retiring</u>	<u>Service</u>	<u>Percent Retiring*</u>
40-44	25%	20	50%
		21	30
45	25	22	20
46	25	23	25
47	25	24	20
48	25		
49	25	25	50
		26	40
50	25	27	40
51	25	28	30
52	25	29	30
53	25		
54	25	30	25
		31	15
55	25	32	100
56	25		
57	25		
58	25		
59	25		
60	30		
61	30		
62	40		
63	40		
64	40		
65	100		

*Members who do not acquire 20 years of service prior to age 62 would be assumed to retire upon first eligibility following attainment of age 62.



Section Four:
Disability Rates

Disability Rates

<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	1	0	1	
25-29	1	7	-6	0.01%
30-34	4	10	-6	0.04%
35-39	4	10	-6	0.05%
40-44	6	18	-12	0.08%
45-49	2	20	-18	0.03%
50-54	5	20	-15	0.10%
55-59	0	18	-18	
60-64	2	9	-7	0.11%
65-69	0	0	0	
70 and Over	0	0	0	

Current Recommended Assumption

<u>Age</u>	<u>Current</u>	<u>Recommended</u>
25	0.15%	0.15%
30	0.16%	0.16%
35	0.23%	0.23%
40	0.34%	0.34%
45	0.52%	0.52%
50	0.83%	0.83%
55	1.45%	1.45%
60	2.00%	2.00%



Section Five:
Mortality Rates

Active Member Mortality Rates

<u>Age</u>	<u>Deaths</u>		<u>Difference</u>	<u>Percent</u>
	<u>Actual</u>	<u>Expected</u>		<u>Died</u>
Under 20	0	0	0	0.00%
20-24	11	2	9	0.22%
25-29	14	5	9	0.16%
30-34	11	7	4	0.12%
35-39	12	9	3	0.15%
40-44	10	12	-2	0.14%
45-49	10	18	-8	0.16%
50-54	19	26	-7	0.37%
55-59	23	31	-8	0.60%
60-64	10	22	-12	0.57%
65-69	4	7	-3	1.20%
70 and Over	1	1	0	1.71%

Retiree Mortality

<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	0	0	0	
25-29	1	0	1	1.82%
30-34	0	0	0	
35-39	0	0	0	
40-44	1	1	0	0.19%
45-49	5	3	2	0.45%
50-54	15	10	5	0.77%
55-59	25	24	1	0.91%
60-64	39	40	-1	1.34%
65-69	56	67	-11	1.80%
70-74	68	75	-7	3.22%
75-79	59	61	-2	5.25%
80-84	35	36	-1	7.81%
85-89	17	14	3	13.28%
90-94	11	8	3	22.00%
95-99	2	3	-1	16.67%
Over 100	1	0	1	100.00%

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	0	0	0	
25-29	1	0	1	7.69%	25-29	0	0	0	
30-34	0	0	0	0.00%	30-34	0	0	0	
35-39	0	0	0		35-39	0	0	0	
40-44	0	1	-1		40-44	1	0	1	0.56%
45-49	4	3	1	0.48%	45-49	1	1	0	0.34%
50-54	14	9	5	0.95%	50-54	1	1	0	0.21%
55-59	22	21	1	1.01%	55-59	3	3	0	0.53%
60-64	35	34	1	1.55%	60-64	4	6	-2	0.61%
65-69	40	57	-17	1.70%	65-69	16	10	6	2.11%
70-74	48	64	-16	3.01%	70-74	20	11	9	3.87%
75-79	42	49	-7	5.17%	75-79	17	11	6	5.45%
80-84	23	26	-3	8.55%	80-84	12	10	2	6.70%
85-89	7	8	-1	12.50%	85-89	10	6	4	13.89%
90-94	7	4	3	33.33%	90-94	4	4	0	13.79%
95-99	1	2	-1	16.67%	95-99	1	1	0	16.67%
Over 100	0	0	0		Over 100	1	0	1	100.00%

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 Corrections Officer Retirement Plan, 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 Plan, 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 for males over age 65, we recommend that the rates be further revised 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 Plan 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.

Year Ended June 30	Increase in CPI-U	Assumed Inflation
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	2.7%	5.0%	0.5%	5.5%
2003	3.4	5.0	0.5	5.5
2004	0.9	5.0	0.5	5.5
2005	4.3	5.0	0.5	5.5
2006	6.8	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 3.6% average annual increase over the period of the Study). Over the past 20 years the annual increase in average salaries has averaged approximately 3%.

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	3.30	9.00
2004	3.74	8.75
2005	3.52	8.50
2006	3.27	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)%	(3.84)%	3.5%	3.0%
2003	1.20	(0.10)	3.5	3.0
2004	0.44	2.84	3.5	3.0
2005	1.02	(0.78)	3.5	3.0
2006	(1.03)	(3.53)	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 Board 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
		Corrections Officers	Dispatchers	
ALL	0	30.00%	30.00%	
	1	30.00	25.00	
	2	25.00	20.00	
	3	20.00	20.00	
	4	15.00	15.00	
25	5 and over	15.00	7.00	0.15%
30		10.00	7.00	0.16
35		10.00	7.00	0.23
40		7.50	6.00	0.34
45		5.50	4.00	0.52
50		5.00	3.50	0.83
55		5.00	3.00	1.45
60		5.00	3.00	2.00

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

<u>Service</u>	<u>Percent of Eligible Active Members Retiring in Year of Attaining Indicated Service</u>
20	50%
21	30
22	20
23	25
24	20
25	50
26	40
27	40
28	30
29	30
30	25
31	15
32	100

Members who do not acquire 20 years of service prior to age 62 are assumed to retire upon first eligibility following attainment of age 62.

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.