

**City of Phoenix Employees' Retirement Plan**

**Experience Study**

**July 1, 2004 through June 30, 2009**

March 22, 2010

The Retirement Board  
City of Phoenix Employees' Retirement Plan  
Phoenix, Arizona

Dear Board Members:

This report contains the results of an Experience Study for the City of Phoenix Employees' Retirement Plan covering the period from July 1, 2004 through June 30, 2009.

The Experience Study was based upon the data submitted by the Retirement Plan for the annual actuarial valuations as of June 30, 2004, 2005, 2006, 2007, 2008, and 2009.

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,



Denise M. Jones  
Senior Consultant



Sandra W. Rodwan  
Member, American Academy of Actuaries

# Table of Contents

## **Section One: Introduction & Summary of Experience**

Purpose of Experience Study .....	1
Summary of Results.....	2

## **Section Two: Withdrawal Rates**

Actual and assumed rates of withdrawal .....	3
Recommendation .....	4

## **Section Three: Retirement Rates**

Age and Service Retirement Rates.....	5
Recommendation .....	6

## **Section Four: Disability Rates**

Disability Rates .....	7
------------------------	---

## **Section Five: Mortality Rates**

Mortality Rates.....	8
----------------------	---

## **Section Six: Economic Assumptions**

Economic Assumptions.....	9
Other Assumptions – Lump Sum Payments.....	12

## **Section Seven: Summary of Recommendations**

Recommendations.....	13
----------------------	----



***Section One:***

***Introduction and Summary of Experience***



## **Purpose of the Experience Study**

The annual actuarial valuations of the Retirement Plan are performed to compute the liabilities associated with active, retired and vested inactive members of the Plan, and to determine contribution rates which will finance those liabilities. The funding objective of the Plan is to make contributions annually which will fund benefits as they accrue and remain level as a percent of active member payroll.

In order to compute the liabilities and contribution rates, it is necessary to make assumptions about the long-term experience of the Plan. These assumptions can be categorized in two categories: demographic and economic.

The demographic assumptions include:

- Withdrawal Rates
- Retirement Rates
- Disability Rates
- Mortality Rates

The economic assumptions include:

- Investment Return
- Inflation Rate
- Across the Board Salary Increases

The purpose of this Experience Study is to compile and analyze the actual experience of the Retirement Plan. This information is then used in the process of selecting the assumptions used 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, 2004 through June 30, 2009.

## **Summary of Results**

### **Demographic Assumptions**

#### **Withdrawal Rates**

Actual withdrawals of active members for reasons other than retirement, disability or death were less than those currently assumed.

#### **Retirement Rates**

Actual age and service retirements were less than those currently assumed.

#### **Disability Rates**

Actual disabilities were less than currently assumed.

#### **Mortality Rates**

Actual post retirement deaths were more than currently assumed for both males and females.

### **Economic Assumptions**

The rates of i) investment return (based on the smoothed market value of assets), ii) inflation and iii) average salary increases have generally been less than assumed over the period of the experience study.



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



## Withdrawal Rates

The rates of withdrawal are the probabilities that active members quit prior to retirement. Select rates of withdrawal are assumed prior to 5 years of service. The select rates are unrelated to age. Ultimate rates based on age are assumed after 5 years of service.

Actual Withdrawals	2,292
Expected Withdrawals	3,130
Ratio of Actual to Expected	0.73

The following table shows the actual rates of withdrawal for the period covered by the Experience Study and compares them with the currently assumed rates.

### Actual and Assumed Rates of Withdrawal

		<b>Actual Withdrawals Per 100 Members With Indicated Age/Service</b>	<b>Present Assumption</b>
<b>Age</b>	<b>Service</b>		
All	0	38.5	20.0%
All	1	6.8	18.0
All	2	3.2	12.0
All	3	2.6	9.0
All	4	1.7	8.0
25	5 and Over	7.1	7.0
30		1.9	6.0
35		2.8	5.0
40		2.4	3.0
45		1.7	3.0
50		1.1	2.5
55		1.5	2.5
60		1.5	2.5
65		0.6	2.5



## Withdrawal Rates --Recommendation

We recommend the assumed withdrawal rates be decreased as follows.

Sample Ages	Years of Service	Assumed Active Members Withdrawing Within Next Year Per 100 Members	
		Present Assumption	Recommended
All	0	20.0	25.0
	1	18.0	15.0
	2	12.0	10.0
	3	9.0	8.0
	4	8.0	7.0
25	5 and Over	7.0	7.0
30		6.0	5.0
35		5.0	4.0
40		3.0	3.0
45		3.0	2.0
50		2.5	2.0
55		2.5	2.0
60		2.5	2.0
65		2.5	2.0



***Section Three:***  
***Retirement Rates***



## Age and Service Retirement Rates

The rates of retirement are the probabilities that a member will retire at a given age following attainment of the age and service requirements for retirement. A member was assumed eligible for retirement when based on the Rule of 80 (age plus service equals 80), attainment of age 62 with 10 years of service or attainment of age 65 with 5 years of service.

Actual Retirements	1,202
Expected retirements	1,501
Ratio of actual to expected	0.80

The following table shows the actual rates of retirement compared with the assumed rates.

### Actual and Assumed Rates of Age and Service Retirement

Retirement Ages	Actual Retirements Per 100 Eligible	Present Assumption
50	19.8	25
51	19.7	25
52	18.3	25
53	25.4	25
54	24.8	25
55	24.4	35
56	22.9	25
57	22.6	25
58	18.6	25
59	28.0	25
60	22.8	25
61	19.3	20
62	27.7	35
63	21.6	30
64	25.5	25
65	24.7	45
66	34.7	30
67	27.5	30
68	16.5	30
69	30.2	30
70	24.7	25

### Age and Service Retirement Rates--Recommendation

We recommend the following Age and Service Retirement Rates.

Retirement Age	Assumed Rates Per 100 Eligible	
	Present Assumption	Recommended
50	25	22
51	25	22
52	25	22
53	25	25
54	25	25
55	35	30
56	25	25
57	25	25
58	25	25
59	25	25
60	25	25
61	20	20
62	35	30
63	30	25
64	25	25
65	45	35
66	30	35
67	30	30
68	30	30
69	30	30
70	100	100



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



## Disability Rates

The disability rates are the probabilities of an active member becoming disabled and receiving a disability pension.

Actual disability retirements	71
Expected disability retirements	115
Ratio of actual to expected	0.62

The following table shows the actual disability retirement rates and present assumed rates.

Age	Actual Disabilities Per 100 Members	Present Assumption
20-24		.03
25-29		.03
30-34		.04
35-39		.05
40-44	.169	.12
45-49	.242	.20
50-54	.330	.40
55-59	.467	.80
60		1.00

**Recommendation:** We recommend decreases in the assumed rates of disability for younger ages, shown below for sample ages. These rates retain a margin for the volatility of disability experience.

Sample Age	Assumed Rates of Disability Per 100 Members	
	Present Assumption	Recommended
20	.03	.02
25	.03	.02
30	.04	.03
35	.05	.04
40	.12	.20
45	.20	.25
50	.40	.35
55	.80	.50
60	1.00	.50



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



## Mortality Rates

The current mortality table used for the actuarial valuations of the City of Phoenix Employees Retirement Plan is the RP 2000 Combined Healthy Mortality Table for Males and Females. This table was first used for the June 30, 2006 annual actuarial valuation.

Compared with the actual post retirement deaths that occurred during the study period, the RP-2000 table had lower expected deaths for both males and females. Therefore, the RP-2000 table has a margin for expected future mortality improvements.

	<u>Males</u>	<u>Females</u>
Actual Deaths	421.0	283.0
Expected Deaths	373.2	238.6
Ratio of actual to expected	112.8	118.6

### Recommendation:

We suggest that the Board continue using the RP-2000 mortality table for purposes of the annual actuarial valuation of the Retirement Plan.

The table below shows sample life expectancies based on the present 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.

<b>Sample Ages</b>	<b>Future Life Expectancies (Years)</b>	
	<b>Males</b>	<b>Females</b>
50	30.8	33.6
55	26.2	29.0
60	21.8	24.4
65	17.6	20.2
70	13.9	16.3
75	10.6	12.8
80	7.8	9.7





***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 Plan are as follows:

Investment Return	8.0%
Inflation	4.5%
Across-the-Board Salary Increases	5.0%
Real Rates of Return (Net of Expenses)	
-Over Inflation	3.5%
-Over Across-the-Board Salary Increases	3.0%

## Average Salary Increases Compared to Assumed Increases

Year Ended June 30	Increase in Average Salary*	Assumed Across-the-Board Salary Increases		
		Inflation	Other	Total
2005	4.2%	4.5%	0.5%	5.0%
2006	3.6	4.5	0.5	5.0
2007	4.2	4.5	0.5	5.0
2008	5.2	4.5	0.5	5.0
2009	(1.6)	4.5	0.5	5.0
5 yr. avg.	3.1	4.5	0.5	5.0

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

Over the period of the Experience Study, the increases in average salary were generally less than the assumed increases.

## 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.

<b>Actuarial Valuation as of June 30</b>	<b>Nominal Rate of Return (Smoothed Asset Value)</b>	<b>Assumed Rate of Return (Net of Expenses)</b>
2005	7.0%	8.0%
2006	7.2	8.0
2007	11.8	8.0
2008	6.7	8.0
2009	(0.2)	8.0
5 yr. avg.	6.4	8.0

## 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</b>	<b>Assumed Inflation</b>
2005	3.1%	4.5%
2006	4.3	4.5
2007	2.7	4.5
2008	5.0	4.5
2009	(1.4)	4.5
5 yr. avg.	2.7	4.5

Over the period of the Experience Study, inflation rates were less than the assumed 4.5% rate. Over the past 30 years the average increase in the CPI has been 3.7%.

## 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
2005	3.9%	2.8	3.0%	3.5%
2006	2.9	3.6	3.0	3.5
2007	9.1	7.6	3.0	3.5
2008	1.7	1.5	3.0	3.5
2009	1.2	1.4	3.0	3.5
5 yr. avg.	3.2	3.4	3.0	3.5

### Recommendation

The real rates of return (based on smoothed market value) over inflation and salary increases during the 5-year experience study period are very close to the assumed rates. The average real rate of return over inflation was 3.2% vs. 3.0% assumed. The average real rate of return over salary increases was 3.4% vs. 3.5% assumed.

The current package of assumed economic assumptions is within a reasonable range of possible assumptions, and is consistent with the assumptions used by numerous other public employee retirement plans.

It should be noted that over the next few years the nominal rate of investment return based on the smoothed market value of assets and the real rates of return over inflation and salary increases are likely to be less than the current assumptions as carry-forwards of the 2008 and 2009 losses are recognized in the funding value of assets. In the absence of favorable experience in other areas, this will result in an increase in contribution rates. If the actual economic experience going forward is less favorable than assumed (i.e. lower investment income than assumed, greater inflation and/or salary increases than assumed), contribution rates will rise further as the negative experience develops.

All assumptions, including 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 Board 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 to avoid long-term increases in funding requirements.

## **Other Assumption**

### **Lump Sum Payments and Compensatory Time**

The inclusion of lump sum payments for unused sick leave and vacation time in the calculation of Final Average Compensation increases pensions and related liabilities. For retirements from July 1, 2004 through June 30, 2009 these lump sum payments alone increased pensions 8.1% on average. Currently, the assumed increase in the liabilities for age and service retirements is 9.0% for the inclusion of the lump sum payments and the granting of service credit for portions of unused sick leave.

**Recommendation:** We recommend that the adjustment to the age and service retirement liabilities to reflect the inclusion of the lump sum payments and compensatory time in pension amounts remain at 9%. The effect of these factors on pension amounts should be monitored and adjustments made as necessary.



***Section Seven:***  
***Summary of Recommendations***



The following table summarizes the recommended changes in assumptions and the effect on the liabilities.

<b>Demographic Assumptions</b>	<b>Recommendation</b>	<b>Effect of Change on Liabilities</b>
Withdrawal	Lower rates	Higher liabilities
Retirement	Lower rates	Lower liabilities
Disability	Lower rates	Lower liabilities
Mortality	No change	No change
<b>Other Assumptions</b>		
Lump Sums and Compensatory Time in FAC	No change, but continued monitoring	-
<b>Economic Assumptions</b>	Refer to Page 11	-