



**City of Phoenix Employees'  
Retirement System**

**June 30, 2012  
Actuarial Valuation**

**Produced by [Cheiron](#)**

**December 2012**

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LETTER OF TRANSMITTAL

December 5, 2012

Board of Retirement  
 City of Phoenix Employees' Retirement System  
 101 South Central Avenue, Suite 600  
 Phoenix, Arizona 85004

Dear Members of the Board:

The purpose of this report is to present the June 30, 2012 actuarial valuation of the City of Phoenix Employees' Retirement System (COPERS). This report is for the use of the COPERS Board, its administrative staff, and its auditors in preparing financial reports in accordance with applicable laws and accounting requirements.

The key results of the valuation are shown in the table below. The June 30, 2011 valuation was performed by the Rodwan Consulting Company.

<b>SUMMARY OF KEY VALUATION RESULTS</b>		
<b>Valuation Date</b>	<b>6/30/2012</b>	<b>6/30/2011</b>
Discount Rate	8.00%	8.00%
Actuarial Liability (AL)	\$ 2,939.4	\$ 2,752.9
Funding Value of Assets (FVA)	\$ 1,827.5	\$ 1,834.6
Unfunded Actuarial Liability (UAL)	\$ 1,111.8	\$ 918.3
FVA Funded Ratio	62.2%	66.6%
Market Value of Assets (MVA)	\$ 1,795.7	\$ 1,824.2
MVA Funded Ratio	61.1%	66.3%
<b>Fiscal Year Ending</b>	<b>6/30/2014</b>	<b>6/30/2013</b>
City Normal Cost Rate	8.37%	9.16%
UAL Rate	13.87%	10.99%
Total City Rate	22.24%	20.15%
Projected Payroll	\$ 564.1	\$ 573.7
Estimated City Contribution Amounts	\$ 125.5	\$ 115.6 <sup>1</sup>

*Dollar amounts in millions*

<sup>1</sup> The FYE 2013 estimated contribution amount is based on the contribution rates developed in the 2011 valuation and the projected 2012-13 payroll from that valuation. The amount shown in the 2011 valuation report (\$110.1 million) used the projected 2011-12 payroll instead.



In preparing our report, we relied on information (some oral and some written) supplied by the COPERS administrative staff. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice #23.

This report was prepared for the COPERS Board for the purposes described herein and for the use by the plan auditor in completing an audit related to the matters herein. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.

This valuation is the first valuation performed by Cheiron for COPERS. The assumptions and methods used in the valuation were adopted by the Board based on recommendations made by the prior actuary. The last experience study performed covered the period from July 1, 2004 through June 30, 2009. We have commenced discussion of alternative assumptions and methods for the Board's consideration. To allow time for additional analysis and consideration of more alternatives, the Board has elected to maintain the current assumptions and methods for this valuation.

We hereby certify that to the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys and our firm does not provide any legal services or advice.

Sincerely,  
Cheiron



Kenneth A. Kent, FSA, FCA, EA, MAAA  
Principal Consulting Actuary



William R. Hallmark, ASA, FCA, EA, MAAA  
Consulting Actuary

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

The primary purpose of this actuarial valuation is to report, as of the valuation date, on the:

- Financial condition of the City of Phoenix Employees' Retirement System,
- Past and expected trends in the financial condition of COPERS,
- City's contribution rates for the Fiscal Year Ending June 30, 2014, and
- Information required by the Governmental Accounting Standards Board (GASB).

The principal valuation results are summarized in this section, including a brief description of the basis upon which the contributions were determined and an examination of the current financial condition of COPERS. In addition, we present a review of the key historical trends followed by the projected financial outlook for COPERS.

**Valuation Basis**

Member contribution rates are set equal to 5.0% of payroll.

COPERS' funding policy sets the City's contribution rates equal to the sum of:

- The entry age normal cost rate minus the Member contribution rate,
- The unfunded actuarial liability (UAL) rate.

The UAL rate is based on a rolling 20-year amortization period with payments as a level percentage of projected payroll assuming payroll increases 5.0% each year.

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**SECTION I  
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**Current Financial Condition**

This section summarizes the key results of the June 30, 2012 valuation compared to the results from the June 30, 2011 valuation.

1. Membership:

As shown in Table I-1 below, total membership grew 0.5% from 2011 to 2012, but the changes between categories of membership were significant. Active membership decreased 2.8%, terminated vested membership increased 2.5% and service retiree membership increased 6.1%. Total payroll decreased by 1.7%, and the average pay per active member increased by 1.5%.

<b>TABLE I - 1 TOTAL MEMBERSHIP</b>			
<b>Item</b>	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>
Active Members			
Vested	7,238	6,943	4.2%
Non-vested	<u>1,087</u>	<u>1,626</u>	-33.1%
Total	8,325	8,569	-2.8%
Terminated Vesteds	697	680	2.5%
Service Retirees	4,455	4,197	6.1%
Disabled Retirees	248	247	0.4%
Beneficiaries	<u>886</u>	<u>850</u>	4.2%
Total Members	14,611	14,543	0.5%
Active Member Payroll	\$ 537.2	\$ 546.4	-1.7%
Average Pay per Active Member			
Actual for Prior Year	\$ 60,783	\$ 59,904	1.5%
Projected for Upcoming Year	\$ 64,532	\$ 63,762	1.2%

*Payroll amounts in millions*

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**SECTION I  
BOARD SUMMARY**

2. Assets and Liabilities:

Table I-2 below compares the assets, liabilities, UAL, and funding ratios between June 30, 2012 and June 30, 2011. The key results shown in Table I-2 indicate that the total actuarial liability increased by 6.8%, and the market value of assets decreased by 1.6%. The Plan employs an asset smoothing method which recognizes differences from the expected investment returns over a four-year period. For this year the smoothed value of assets (called the funding value of assets) decreased by 0.4%. The ratio of the funding value of assets to the market value of assets increased from 101% to 102%, indicating that the deferred losses are only slightly greater than the deferred gains. Finally, the unfunded actuarial liability (actuarial liability less funding value of assets) increased from \$918.3 million to \$1,111.8 million, resulting in a decrease in the funding ratio from 66.6% to 62.2%. Based on the market value of assets, the funding ratio decreased from 66.3% to 61.1%.

As presented in the body of our report the sources for the increase in the unfunded actuarial liability include: lower than expected return on assets, changes in valuation software and liability measurements as a result of the change in actuary, additional retirees not included in the prior year's census, and other demographic changes, offset in part by lower than expected salary growth for active members.

<b>TABLE I - 2</b>			
<b>ASSETS AND LIABILITIES</b>			
<b>Item</b>	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>
Actuarial Liability			
Actives	\$ 1,376.7	\$ 1,285.7	7.1%
Terminated Vesteds	37.5	35.3	6.3%
In Pay Status	1,525.2	1,431.9	6.5%
Total Actuarial Liability	<u>\$ 2,939.4</u>	<u>\$ 2,752.9</u>	6.8%
Market Value of Assets	\$ 1,795.7	\$ 1,824.2	-1.6%
Funding Value of Assets	\$ 1,827.5	\$ 1,834.6	-0.4%
Unfunded Actuarial Liability	\$ 1,111.8	\$ 918.3	21.1%
Funding Ratio - Market Value	61.1%	66.3%	-7.8%
Funding Ratio - Funding Value	62.2%	66.6%	-6.7%

*Dollar amounts in millions*

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**SECTION I  
BOARD SUMMARY**

3. Contributions:

Table I-3 shows sources for the change in the City contribution rate from the rate that was calculated in the prior report. COPERS' experience increased the City's contribution rate from 20.15% to 22.24%.

<b>TABLE I - 3</b>					
<b>RECONCILIATION OF CHANGES IN CONTRIBUTION RATES AND AMOUNTS</b>					
	<b>City Normal Cost</b>	<b>UAL Rate</b>	<b>Total City Rate</b>	<b>Projected Payroll</b>	<b>City Contribution Amount</b>
FYE 2013 Contribution	9.16%	10.99%	20.15%	\$ 573.7	\$ 115.6
Expected FYE 2014 Contribution	9.16%	10.59%	19.75%	\$ 602.4	\$ 119.0
<b><u>Changes Due to:</u></b>					
Change in method	-0.73%	1.11%	0.38%	\$ 602.4	\$ 2.3
Reduction in total payroll	0.00%	0.79%	0.79%	\$ 564.1	\$ (3.2)
Investment experience	0.00%	1.63%	1.63%	\$ 564.1	\$ 9.2
Demographic experience	-0.06%	-0.25%	-0.31%	\$ 564.1	\$ (1.7)
<b>FYE 2014 Contribution Rates</b>	<b>8.37%</b>	<b>13.87%</b>	<b>22.24%</b>	<b>\$ 564.1</b>	<b>\$ 125.5</b>

*Dollar amounts in millions*



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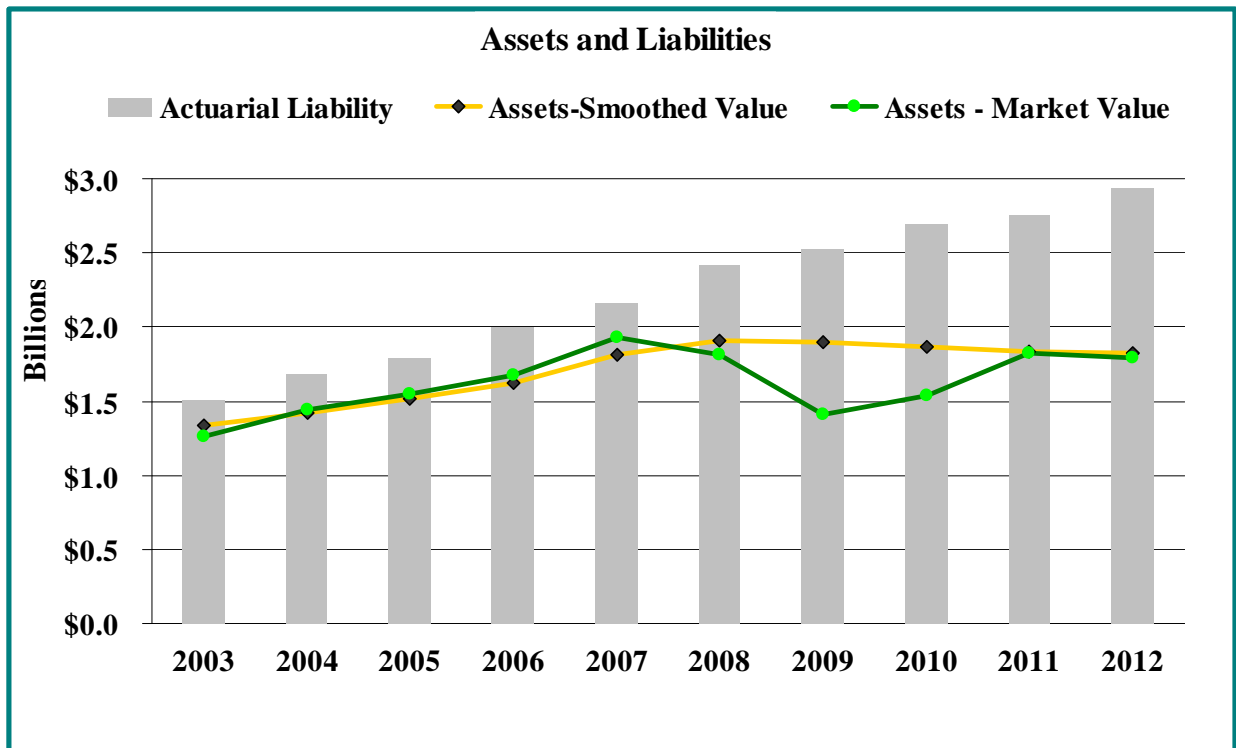
**SECTION I  
BOARD SUMMARY**

**Historical Trends**

Despite the fact that most of the attention given to the valuation is with respect to the most recently computed unfunded actuarial liability, funding ratio, and contribution rates, it is important to remember that each valuation is merely a snapshot of the long-term progress of a pension fund. The results of the current year's valuation should be evaluated in the context of historical trends, as well as trends expected in the future. In the charts below, all information shown prior to the June 30, 2012 actuarial valuation (prior to contribution rates for the fiscal year ending June 30, 2014) was calculated by the prior actuary.

The chart below shows the historical trends for assets (both market and smoothed) compared to the actuarial liability, and also shows the progress of the funding ratios since 2003. From 2003 to 2012, the funding ratio has declined with most of the decrease attributable to the decline of the assets since 2008.

**COPERS Assets and Liabilities 2003-2012**



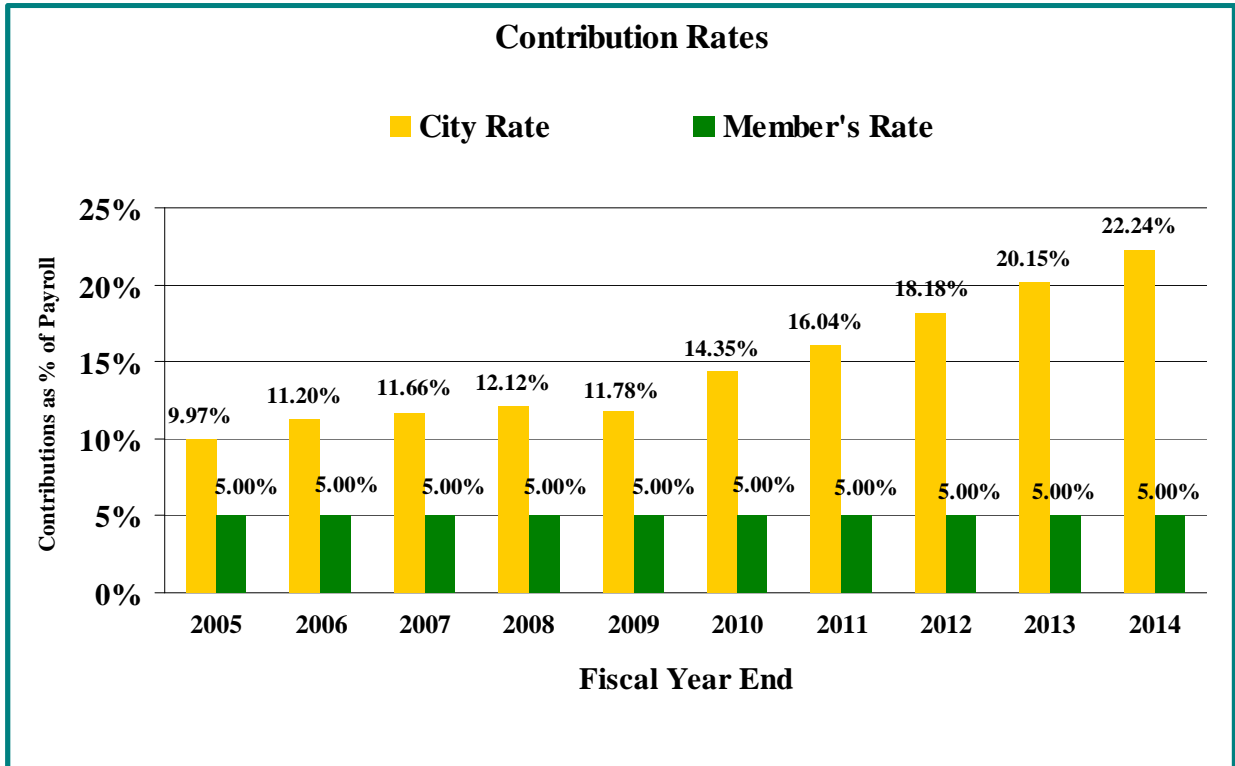
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Funded Ratio	88.5%	84.2%	84.2%	81.3%	83.9%	79.1%	75.3%	69.3%	66.6%	62.2%
UAL/(Surplus) <i>(in millions)</i>	\$ 173.5	\$ 267.0	\$ 284.0	\$ 373.6	\$ 349.6	\$ 505.0	\$ 622.9	\$ 829.2	\$ 918.3	\$ 1,111.9

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The chart below shows the historical trends for the COPERS' contribution rates since the fiscal year ending June 30, 2005.

**City and Member Contribution Rates for FYE 2005 - 2014**



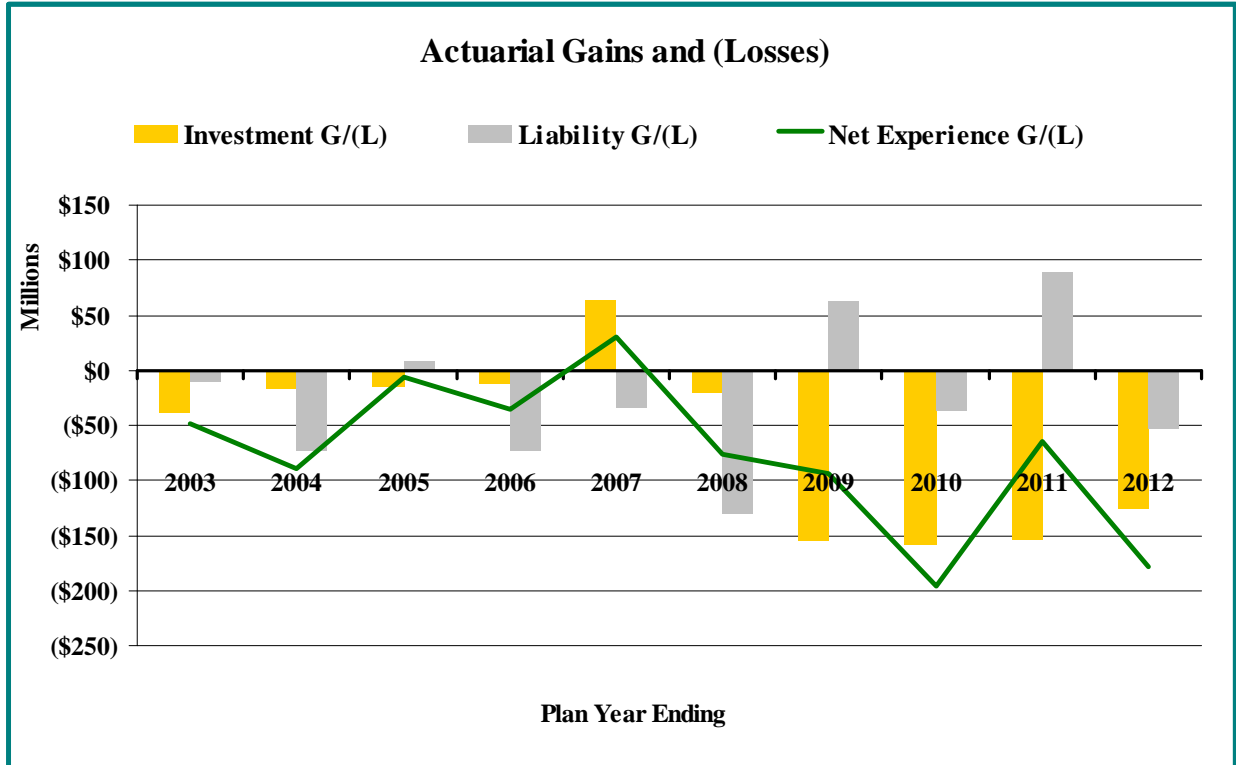
Reflecting the declining funded status since 2008, the City's contribution rate has steadily increased from FYE 2010 through FYE 2014.

The next chart on the following page shows COPERS' actuarial gains and losses, broken into the investment and liability components. The chart does not include any changes in the COPERS' assets and liabilities attributable to changes in methods, procedures or assumptions.

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BOARD SUMMARY

COPERS Historical Gain/(Loss) 2003-2012



The key insights from this chart are:

- The investment losses (gold bars) from 2009 have been recognized in the succeeding four years. Because the funding value of assets and market value of assets are now relatively close, future investment gains and losses will largely reflect future investment performance.
- On the liability side, experience since 2009 has been relatively balanced between gains and losses while experience prior to 2009 appears to have been dominated by losses.

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**SECTION I  
BOARD SUMMARY**

**Projected Financial Trends**

This section shows projections based on the June 30, 2012 valuation results of the future outlook for COPERS in terms of projected assets and liabilities and future expected contribution rates.

In the charts that follow, projections of assets and liabilities, the pay down of UAL, and City contribution rates are shown on two different bases:

- 1) Assuming no gains or losses compared to the assumptions (i.e., 8.00% return for 2012-13 and each and every year that follows, and
- 2) Assuming returns shown in the table below. These are rates of return that vary each year, but over the projection period average the assumed 8.00% return. The purpose of this set of returns is not to predict the future, but to illustrate the impact of investment volatility on future contribution rates because investment returns will never be level each and every year.

<b>FYE</b>	<b><u>2013</u></b>	<b><u>2014</u></b>	<b><u>2015</u></b>	<b><u>2016</u></b>	<b><u>2017</u></b>	<b><u>2018</u></b>	<b><u>2019</u></b>	<b><u>2020</u></b>	<b><u>2021</u></b>	<b><u>2022</u></b>
<b>Return</b>	20.0%	8.0%	4.0%	20.0%	-4.0%	18.0%	13.0%	9.0%	-9.0%	20.0%
<b>FYE</b>	<b><u>2023</u></b>	<b><u>2024</u></b>	<b><u>2025</u></b>	<b><u>2026</u></b>	<b><u>2027</u></b>	<b><u>2028</u></b>	<b><u>2029</u></b>	<b><u>2030</u></b>	<b><u>2031</u></b>	<b><u>2032</u></b>
<b>Return</b>	9.0%	-6.0%	8.0%	14.0%	17.0%	-7.0%	-15.0%	30.0%	25.0%	0.0%

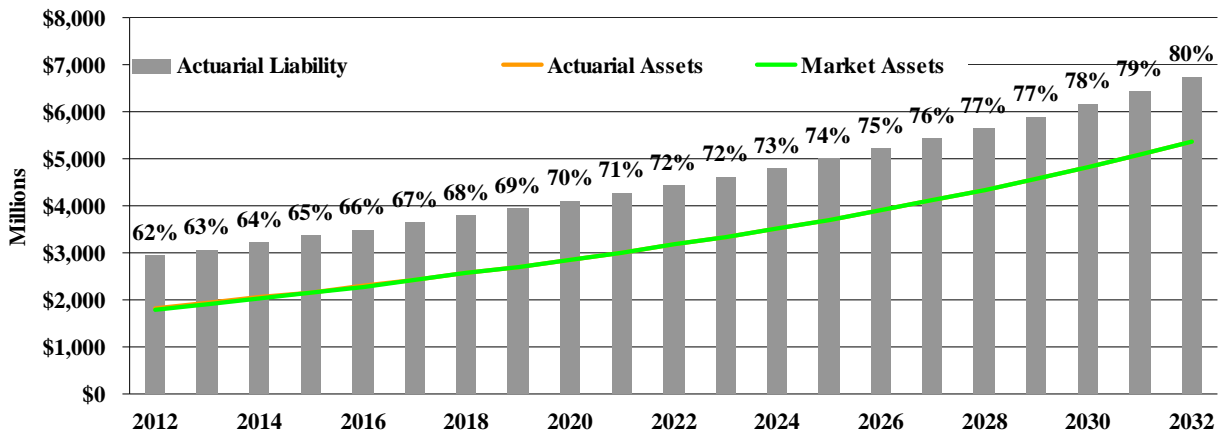
**Please note that the investment returns shown above were selected solely to illustrate the impact of investment volatility on the pattern of funded status and City contribution rates. They are not intended to be predictive of actual future contribution rates or funded status or to represent a realistic pattern of investment returns.**

SECTION I  
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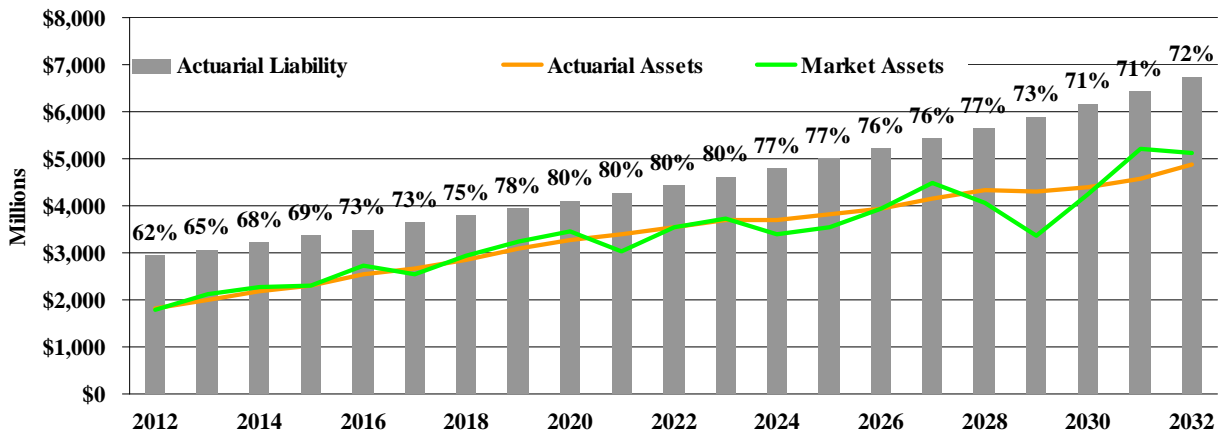
**Projected Assets and Liabilities**

The charts below show the projected actuarial liability (gray bars) as well as the funding value of assets (orange line) and the market value of assets (green line). The projected funded status is shown at the top of each gray bar. Chart 1 shows that if all assumptions are met each and every year, the funded status is expected to steadily improve from 62% to 80% over the 20-year period. It also shows that the difference in the dollar value of UAL increases slightly during the projection period. This result is a function of the rolling 20-year amortization of the UAL employed in the determination of contribution rates. Chart 2 shows how variable investment returns can impact the progression of funding ratios even if the average return is the same as the assumed return. It also illustrates that the impact of negative cash flows in the down markets result in a lower funded status even though the average return during the period is 8.0%.

**Chart 1: Projection of Assets and Liabilities, 8.0% return each year**



**Chart 2: Projection of Assets and Liabilities, varying returns averaging 8.0% over time**



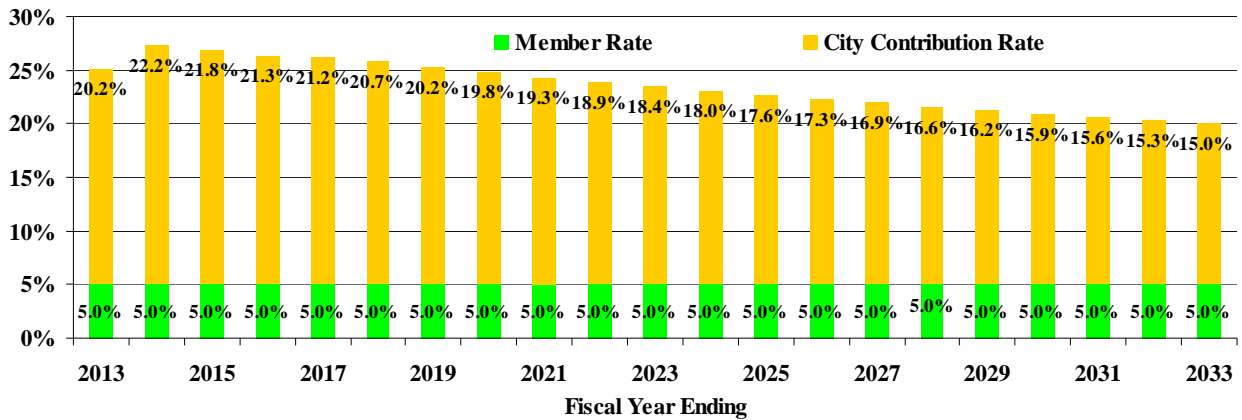
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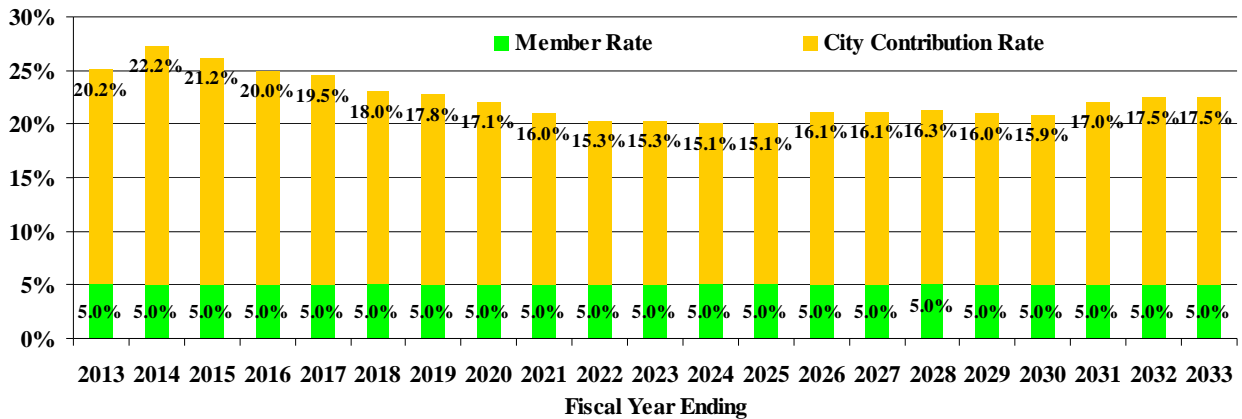
**Projected Contribution Rates**

The charts below show projected member contribution rates (green bars) and City contribution rates (gold bars). Chart 3 shows that if all assumptions are met each and every year, City contribution rates are expected to steadily decline over time from approximately 22.2% in FYE 2014 to approximately 15.0% in FYE 2033. Chart 4 illustrates the sensitivity of these projected contribution rates to variable investment returns even if the average return is the same as the assumed return.

**Chart 3: Projected Contribution Rates, 8.0% return each year**



**Chart 4: Projected Contribution Rates, varying returns averaging 8.0% over time**



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
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**SECTION II  
ASSETS**

COPERS uses and discloses two different asset measurements which are presented in this section of the report: market value and funding value of assets. The market value represents, as of the valuation date, the value of the assets if they were liquidated on that date. The funding value of assets is a value that smoothes annual investment returns over multiple years to reduce the impact of short-term investment volatility on employer contribution rates. The funding value of assets also excludes amounts that have been transferred to the Pension Equalization Reserve (PER).

This section shows the Statement of Changes in the Market Value of Assets and the Development of the Funding Value of Assets.

**Statement of Changes in the Market Value of Assets**

Table II-1 shows sources for the change in the market value of assets for the current and prior years.

<b>TABLE II - 1</b>		
<b>CHANGES IN MARKET VALUE OF ASSETS</b>		
	<b>June 30, 2012</b>	<b>June 30, 2011</b>
Market Value, Beginning of Year	\$ 1,824,206,986	\$ 1,535,173,679
Contributions		
Member	\$ 28,139,617	\$ 28,647,917
City	105,682,325	90,965,262
Inter-System Transfers	4,029,574	4,998,865
Total	\$ 137,851,516	\$ 124,612,044
Net Investment Earnings	\$ (5,991,491)	\$ 315,683,759
Disbursements	\$ (160,376,711)	\$ (151,262,496)
Market Value, End of Year	\$ 1,795,690,300	\$ 1,824,206,986

The net investment earnings for the year ended June 30, 2012 represent approximately a -0.3% return on the market value of assets compared to an assumed return of 8.0%. For the year ended June 30, 2011, the net investment return was approximately 20.7%.

**SECTION II  
ASSETS**

**Funding Value of Assets**

To determine on-going contribution amounts, most pension funds use an actuarial value of assets that smoothes year-to-year market value returns in order to reduce the volatility of contribution rates.

The actuarial value of assets for COPERS is calculated by recognizing the deviation of actual investment returns compared to the expected return (8.00%) on the prior year's actuarial value of assets over a four-year period. The dollar amount of the expected return on the actuarial value of assets is determined using the actual contributions and benefit payments during the year. Any difference between this amount and the actual net investment earnings is considered a gain or loss. Table II-2 below shows the gains and losses for the last four years and the portion of each gain or loss that is not recognized in the current actuarial value of assets. These deferred amounts will be recognized in future years.

For determining the Funding Value of Assets, the assets in the Pension Equalization Reserve are subtracted from the actuarial value of assets.



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**SECTION II  
ASSETS**

<b>TABLE II - 2</b>		
<b>DEVELOPMENT OF FUNDING VALUE OF ASSETS</b>		
	<b>June 30, 2012</b>	<b>June 30, 2011</b>
1. Actuarial Value of Assets Beginning of Year (includes PER)	\$ 1,835,185,304	\$ 1,868,636,402
2. Net Cash Flow	(22,525,195)	(26,650,452)
3. Expected Return	145,931,150	148,424,894
4. Actual Return	(5,991,491)	315,683,759
5. Current Year Gain / (Loss) [ 4. - 3. ]	(151,922,641)	167,258,865
6. Gains / (Losses)		
a. Current Year	\$ (151,922,641)	\$ 167,258,865
b. Prior Year	167,258,865	(8,407,500)
c. 2nd Prior Year	(8,407,500)	(528,874,868)
d. 3rd Prior Year	(528,874,868)	(250,878,656)
7. Phase-In Amounts		
a. Current Year [25% of 6.a.]	\$ (37,980,660)	\$ 41,814,716
b. Prior Year [25% of 6.b.]	41,814,716	(2,101,875)
c. 2nd Prior Year [25% of 6.c.]	(2,101,875)	(132,218,717)
d. 3rd Prior Year [25% of 6.d.]	(132,218,717)	(62,719,664)
e. Total [7.a. + 7.b. + 7.c. + 7.d.]	\$ (130,486,536)	\$ (155,225,540)
8. Actuarial Value of Assets End of Year [1. + 2. + 3. + 7.e.]	\$ 1,828,104,723	\$ 1,835,185,304
9. Pension Equalization Reserve	\$ 576,321	\$ 565,020
10. Funding Value of Assets [8. - 9.]	\$ 1,827,528,402	\$ 1,834,620,284

On the basis of the smoothed funding value of assets, the return for the year ending June 30, 2012 was approximately 0.85%, significantly less than the assumed return of 8.0%, but greater than the return on the market value of assets.

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**SECTION III  
LIABILITIES**

This section presents detailed information on measures of COPERS' liability, including:

- Present value of future benefits,
- Actuarial liability
- Normal cost, and
- Analysis of changes in the unfunded actuarial liability during the year.

**Present Value of Future Benefits**

The present value of future benefits represents the expected amount of money needed today to fully pay off all benefits both earned as of the valuation date and those to be earned in the future by current plan members under the current plan provisions. Table III-1 below shows the present value of future benefits as of June 30, 2012 and June 30, 2011.

<b>TABLE III - 1</b>		
<b>PRESENT VALUE OF FUTURE BENEFITS</b>		
	<b>June 30, 2012</b>	<b>June 30, 2011</b>
<b>Actives</b>		
Retirement	\$ 1,665,522,908	N/A
Termination	106,706,284	N/A
Death	42,397,766	N/A
Disability	77,820,723	N/A
<b>Total Actives</b>	<b>\$ 1,892,447,681</b>	<b>\$ 1,906,976,712</b>
<b>In Pay Status</b>		
Service Retirees	\$ 1,369,744,522	N/A
Disabled Retirees	37,228,384	N/A
Beneficiaries	118,178,945	N/A
<b>Total</b>	<b>\$ 1,525,151,851</b>	<b>\$ 1,431,877,432</b>
Deferred Vested	\$ 37,543,513	\$ 35,326,495
<b>Total</b>	<b>\$ 3,455,143,045</b>	<b>\$ 3,374,180,639</b>

*The June 30, 2011 liabilities were calculated by the prior actuary and a breakdown was not provided.*

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**SECTION III  
LIABILITIES**

**Normal Cost**

Under the Entry Age (EA) actuarial cost method, the present value of future benefits for each individual is spread over the individual's expected working career under the System as a level percentage of the individual's expected pay. The normal cost rate is determined by taking the value, as of entry age into the System, of each member's projected future benefits. This value is then divided by the value, also at entry age, of the each member's expected future salary. The normal cost rate is multiplied by current salary to determine each member's normal cost. The normal cost of the System is the sum of the normal costs for each individual in the System. The normal cost represents the expected amount of money needed to fund the benefits attributed to the next year of service under the EA method. Table III-2 below shows the EA normal cost as of June 30, 2012 and June 30, 2011. The change in the normal cost rate is primarily due to the change in method reflecting the change in valuation software and liability measurements as a result of the change in actuary.

<b>TABLE III - 2</b>				
<b>ENTRY AGE NORMAL COST</b>				
	<b>June 30, 2012</b>		<b>June 30, 2011</b>	
Actives				
Retirement	\$	52,842,498	\$	53,170,902
Termination		7,342,276		11,146,308
Death		2,073,176		2,711,264
Disability		3,657,237		4,066,896
Total Normal Costs	\$	<u>65,915,187</u>	\$	<u>71,095,370</u>
Expected payroll for current actives	\$	493,064,039	\$	502,085,946
Entry Age Normal Cost Rates		13.37%		14.16%

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**SECTION III  
LIABILITIES**

**Actuarial Liability**

The actuarial liability represents the expected amount of money needed today to pay for benefits attributed to service prior to the valuation date under the Entry Age (EA) actuarial cost method. It is essentially a funding target. The difference between the actuarial liability and the funding value of assets is the unfunded actuarial liability. Table III-3 below shows the actuarial liability as of June 30, 2012 and June 30, 2011.

<b>TABLE III - 3</b>		
<b>ACTUARIAL LIABILITY</b>		
	<b>June 30, 2012</b>	<b>June 30, 2011</b>
<b>Actives</b>		
Retirement	\$ 1,245,668,343	N/A
Termination	54,358,725	N/A
Death	26,814,432	N/A
Disability	49,836,854	N/A
Total Actives	<u>\$ 1,376,678,354</u>	<u>\$ 1,285,705,122</u>
<b>In Pay Status</b>		
Service Retirees	\$ 1,369,744,522	N/A
Disabled Retirees	37,228,384	N/A
Beneficiaries	118,178,945	N/A
Total	<u>\$ 1,525,151,851</u>	<u>\$ 1,431,877,432</u>
Deferred Vested	\$ 37,543,513	\$ 35,326,495
Total Actuarial Liability	\$ 2,939,373,718	\$ 2,752,909,049

*The June 30, 2011 liabilities were calculated by the prior actuary and a breakdown was not provided.*

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**SECTION III  
LIABILITIES**

**Analysis of Change in Unfunded Actuarial Liability (UAL)**

The UAL of any retirement plan is expected to change at each subsequent valuation for a variety of reasons. Table III-4 below develops the expected UAL and identifies the primary sources for changes in the UAL since the last valuation.

<b>TABLE III - 4</b>	
<b>DEVELOPMENT OF EXPERIENCE (GAIN) / LOSS</b>	
<b>Item</b>	<b>Amount</b>
1. Unfunded actuarial liability, June 30, 2011	\$ 918,288,765
2. Normal cost for year	77,366,486
3. City and employee contributions	133,821,942
4. Interest	71,248,326
5. Expected unfunded actuarial liability, June 30, 2012 (1. + 2. - 3. + 4.)	\$ 933,081,635
6. Actual unfunded actuarial liability, June 30, 2012	\$ 1,111,845,315
7. Difference (6. - 5.)	\$ 178,763,681
Difference portion due to:	
Asset experience	\$ 126,264,979
Salary experience	(59,435,707)
Change in method <sup>1</sup>	72,832,691
June 2011 retirees	22,133,081
Other experience (mortality, retirments, etc.)	16,968,637
Total	\$ 178,763,681

<sup>1</sup>The change in method reflects the differences in the valuation of liabilities by Cheiron and the prior actuary as a function of the transition.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**SECTION IV  
CONTRIBUTIONS**

Under the method employed by COPERS, there are two components to the City's contribution: the City's normal cost and an amortization payment on the unfunded actuarial liability. The normal cost rate was developed in Section III. This section develops the UAL contribution rate.

The UAL is composed of experience gains and losses, assumption changes and plan provision changes. Each valuation, the entire UAL is amortized over a 20-year period as a level percentage of expected payroll assuming 5.0% annual increases in payroll. Table IV-1 below shows the development of the UAL rate as of June 30, 2012 and June 30, 2011.

Under this method, because the entire UAL is re-amortized each year, if all assumptions are met, the UAL will never be paid off. In fact, as a dollar amount, the UAL is expected to continue to grow indefinitely, although it is expected to become smaller and smaller compared to payroll.

<b>TABLE IV - 1</b>		
<b>DEVELOPMENT OF UAL CONTRIBUTION RATE</b>		
	<b>June 30, 2012</b>	<b>June 30, 2011</b>
Actuarial liability	\$ 2,939,373,718	\$ 2,752,909,049
Funding value of assets	<u>1,827,528,402</u>	<u>1,834,620,284</u>
Unfunded actuarial liability (UAL)	\$ 1,111,845,315	\$ 918,288,765
20-year amortization payment	\$ 74,514,160	\$ 60,057,148
Projected valuation year payroll	\$ 537,229,545	\$ 546,373,486
UAL contribution rate	13.87%	10.99%

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**SECTION IV  
CONTRIBUTIONS**

Table IV-2 below summarizes the contribution rates and expected contribution amounts for the fiscal years ending June 30, 2014 and June 30, 2013.

<b>TABLE IV - 2</b>		
<b>SUMMARY OF CONTRIBUTION RATES AND ESTIMATED AMOUNTS</b>		
	<b>June 30, 2014</b>	<b>June 30, 2013</b>
City normal cost rate	8.37%	9.16%
UAL contribution rate	13.87%	10.99%
Total City contribution rate	<u>22.24%</u>	<u>20.15%</u>
Projected fiscal year payroll	\$ 564,091,022	\$ 573,692,160
Projected contribution amount	\$ 125,454,287	\$ 115,610,207 <sup>1</sup>

<sup>1</sup> The FYE 2013 estimated contribution amount is based on the contribution rates developed in the 2011 valuation and the projected 2012-13 payroll from that valuation. The amount shown in the 2011 valuation report (\$110.1 million) used the projected 2011-12 payroll instead.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**SECTION V  
ACCOUNTING STATEMENT INFORMATION**

Statement No. 25 of the Governmental Accounting Standards Board (GASB) establishes standards for accounting and financial reporting of pension information by public employee retirement systems.

The basic GASB No. 25 disclosure compares the actuarial liability to the funding value of assets to determine the unfunded actuarial liability and the funded ratio. The relevant amounts as of June 30, 2012 and June 30, 2011 are presented in Table V-1.

<b>TABLE V - 1</b>			
<b>GASB No. 25 LIABILITY</b>			
<b>Item</b>	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>
1. Actuarial liability			
a. Members currently receiving payments	\$ 1,525,151,851	\$ 1,431,877,432	6.5%
b. Vested terminated and inactive members	37,543,513	35,326,495	6.3%
c. Active members	<u>1,376,678,354</u>	<u>1,285,705,122</u>	7.1%
d. Total actuarial liability	\$ 2,939,373,718	\$ 2,752,909,049	6.8%
2. Funding value of assets	\$ 1,827,528,402	\$ 1,834,620,284	-0.4%
3. Unfunded actuarial liability	\$ 1,111,845,315	\$ 918,288,765	21.1%
4. Ratio of funding value of assets to actuarial liability (2 ÷ 1.d.)	62.2%	66.6%	-6.7%

Tables V-2 through V-5 are exhibits for use in COPERS' Comprehensive Annual Financial Report (CAFR). The Government Finance Officers Association (GFOA) recommends showing at least 6 years of experience in each of these exhibits. Table V-2 shows the Notes to Required Supplementary Information. Table V-3 presents an analysis of financial experience for the valuation year; Table V-4 presents the Solvency Test which shows the portion of actuarial liability covered by assets; and Table V-5 presents the Schedule of Funding Progress.



CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION

SECTION V  
ACCOUNTING STATEMENT INFORMATION

**TABLE V - 2**

**NOTES AND REQUIRED SUPPLEMENTARY INFORMATION**

The information presented in the required supplementary schedules to the Financial Section of the CAFR was determined as part of the actuarial valuation at the date indicated. Additional information as of the latest actuarial valuation follows.

<i>Valuation date</i>	June 30, 2012
<i>Actuarial funding method</i>	Individual Entry Age Normal
<i>Amortization method</i>	Level percent of payroll, open
<i>Amortization period</i>	20 Years
<i>Asset valuation method</i>	Four-year smoothed market value
<u>Actuarial assumptions:</u>	
<i>Investment rate of return</i>	8.00%
<i>Wage inflation</i>	5.00%
<i>Projected salary increases including wage inflation</i>	5.0% - 8.8%
<i>Postretirement benefit increases</i>	0.00%

The actuarial assumptions and methods were adopted by the COPERS Board based on recommendations made by the prior actuary. These recommendations were based on an experience study covering the period July 1, 2004 through June 30, 2009. Cheiron has recommended an analysis of the methods and assumptions, but no changes have been adopted for this valuation.

The rate of employer contributions is composed of the employer normal cost and amortization of the unfunded actuarial liability. The employer normal cost is a level percent of payroll cost which, along with the member contributions, is expected to pay for projected benefits at retirement for each individual plan member. The actuarial liability is that portion of the present value of projected benefits that is not expected to be paid by future employer normal costs or member contributions. The difference between the actuarial liability and the funding value of assets as of the same date is the unfunded actuarial liability. The amortization of the unfunded actuarial liability is based on a 20-year open period as a level percentage of expected payroll.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**SECTION V  
ACCOUNTING STATEMENT INFORMATION**

**TABLE V - 3  
ANALYSIS OF FINANCIAL EXPERIENCE**

	<u>2012</u>	<u>2011</u>	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>
(1) UAL at Start of Year	\$ 918,289	\$ 829,195	\$ 622,946	\$ 504,950	\$ 349,611	\$ 373,605
(2) Normal Cost for year	77,366	80,099	78,731	83,089	72,806	66,245
(3) Contributions	(133,822)	(119,613)	(116,482)	(98,157)	(95,435)	(88,358)
(4) Assumed Investment Income Accrual on (1), (2) and (3)	<u>71,248</u>	<u>64,652</u>	<u>48,228</u>	<u>39,755</u>	<u>27,005</u>	<u>29,004</u>
(5) Expected UAL Before Changes	\$ 933,081	\$ 854,333	\$ 633,424	\$ 529,637	\$ 353,987	\$ 380,496
(6) Effect of Assumption Changes	-	-	-	-	-	-
(7) Effect of Method Changes	-	-	-	-	74,539	-
(8) Effect of Benefit Changes	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
(9) Expected UAL After Changes	\$ 933,081	\$ 854,333	\$ 633,424	\$ 529,637	\$ 428,526	\$ 380,496
(10) Actual UAL	<u>1,111,845</u>	<u>918,289</u>	<u>829,195</u>	<u>622,946</u>	<u>504,950</u>	<u>349,611</u>
(11) Gain / (Loss) { (9) - (10) }	\$(178,764)	\$ (63,956)	\$(195,771)	\$ (93,309)	\$ (76,424)	\$ 30,885
(12) As % of AL at Start of Year	(6.5)%	(2.4)%	(7.8)%	(3.9)%	(3.5)%	1.5%

*Dollar amounts in thousands*

**TABLE V - 4  
SOLVENCY TEST**

Valuation Date	Aggregate Accrued Liabilities for			Valuation Assets	Portion of Accrued Liabilities Covered by Assets		
	(1)	(2)	(3)		(1)	(2)	(3)
	Active Member Contributions	Retirees and Beneficiaries	Active Members Employer Portion				
6/30/2012	\$443,964	\$1,525,152	\$970,258	\$1,827,528	100%	91%	0%
6/30/2011	446,456	1,431,877	874,576	1,834,620	100	97	0
6/30/2010	445,141	1,311,929	940,217	1,868,093	100	100	12
6/30/2009	446,039	1,193,391	878,664	1,895,148	100	100	29
6/30/2008	433,742	1,066,886	912,737	1,908,414	100	100	45
6/30/2007	403,819	964,006	798,294	1,816,508	100	100	56
6/30/2006	374,091	892,123	734,131	1,626,741	100	100	49
6/30/2005	354,438	798,414	642,663	1,511,553	100	100	56
6/30/2004	334,535	737,684	612,577	1,417,774	100	100	56
6/30/2003	317,582	659,634	526,909	1,330,584	100	100	67

*Dollar amounts in thousands*

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**SECTION V  
ACCOUNTING STATEMENT INFORMATION**

<b>TABLE V - 5 SCHEDULE OF FUNDING PROGRESS</b>						
<b>Valuation Date</b>	<b>(1) Funding Value</b>	<b>(2) Actuarial Liability</b>	<b>(3) Percent Funded</b>	<b>(4) Unfunded AL (UAL)</b>	<b>(5) Annual Covered Payroll</b>	<b>(6) UAL as a % of Covered Payroll</b>
<b>June 30,</b>	<b>of Assets</b>	<b>(AL)</b>	<b>(1) / (2)</b>	<b>(2) - (1)</b>		<b>(4) / (5)</b>
1997	\$ 840,539	\$ 888,968	94.6%	\$ 48,429	\$ 294,678	16.4%
1998	984,501	973,048	101.2	(11,453)	322,475	-
1999	1,117,497	1,044,425	107.0	(73,072)	336,153	-
2000	1,219,892	1,199,871	101.7	(20,021)	360,654	-
2001	1,291,338	1,259,564	102.5	(31,774)	376,913	-
2002	1,273,731	1,390,273	91.6	116,542	404,414	28.8
2003	1,330,584	1,504,125	88.5	173,541	416,472	41.7
2004	1,417,774	1,684,795	84.2	267,021	445,348	60.0
2005	1,511,553	1,795,514	84.2	283,962	467,998	60.7
2006	1,626,741	2,000,346	81.3	373,605	497,105	75.2
2007	1,816,508	2,166,119	83.9	349,611	535,079	65.3
2008	1,908,414	2,413,365	79.1	504,951	566,512	89.1
2009	1,895,148	2,518,094	75.3	622,946	539,468	115.5
2010	1,868,093	2,697,288	69.3	829,195	550,175	150.7
2011	1,834,620	2,752,909	66.7	918,289	513,322	178.9
2012	1,827,528	2,939,374	62.2	1,111,845	506,017	219.7

*Dollar amounts in thousands*

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

<b>TABLE A - 1</b>			
<b>ACTIVE MEMBER DATA</b>			
	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>
<b>Total</b>			
Count	8,325	8,569	-2.8%
Average Current Age	46.5	46.1	0.8%
Average Vesting Service	12.5	12.8	-2.4%
Prior Year Actual Annualized Pensionable Earnings			
Total	\$ 506,016,928	\$ 513,312,633	-1.4%
Average	\$ 60,783	\$ 59,904	1.5%

<b>TABLE A - 2</b>						
<b>NON-ACTIVE MEMBER DATA</b>						
	<b>Count</b>			<b>Average Age</b>		
	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>
<b>Total</b>						
Retirees	4,455	4,197	6.1%	68.6	68.5	0.1%
Disableds	248	247	0.4%	62.0	62.2	-0.4%
Beneficiaries & QDROs	886	850	4.2%	71.9	71.4	0.6%
Payee Total	5,589	5,294	5.6%	68.8	68.7	0.2%
Deferred Vested	697	680	2.5%	48.6	48.6	0.0%

<b>TABLE A - 3</b>						
<b>NON-ACTIVE MEMBER DATA</b>						
	<b>Total Annual Benefit*</b>			<b>Average Annual Benefit*</b>		
	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>	<b>June 30, 2012</b>	<b>June 30, 2011</b>	<b>% Change</b>
<b>Total</b>						
Retirees	\$ 142,722,085	\$ 133,308,193	7.1%	\$ 32,036	\$ 31,763	0.9%
Disableds	3,570,997	3,545,913	0.7%	14,399	14,356	0.3%
Beneficiaries & QDROs	15,295,172	14,301,838	6.9%	17,263	16,826	2.6%
Payee Total	\$ 161,588,254	\$ 151,155,944	6.9%	\$ 28,912	\$ 28,552	1.3%
Deferred Vested	\$ 8,158,009	\$ 7,811,158	4.4%	\$ 11,704	\$ 11,487	1.9%

\* Benefits provided in June 30 valuation data

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**TABLE A - 4  
DISTRIBUTION OF ACTIVE MEMBERS AS OF JUNE 30, 2012**

Age	Years of Vesting Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	26	58	17	0	0	0	0	0	0	0	0	101
25 to 29	36	149	216	8	0	0	0	0	0	0	0	409
30 to 34	41	144	406	163	10	0	0	0	0	0	0	764
35 to 39	33	125	399	336	98	6	0	0	0	0	0	997
41 to 44	37	112	376	378	256	95	10	0	0	0	0	1,264
45 to 49	22	103	298	313	294	265	170	19	0	0	0	1,484
50 to 54	31	73	276	260	260	265	253	56	0	0	0	1,474
55 to 59	11	46	195	229	216	204	155	61	13	0	0	1,130
60 to 64	8	24	119	122	110	88	63	17	8	2	0	561
65 to 69	0	8	41	26	20	15	11	5	2	0	0	128
70 & up	0	0	4	4	2	1	1	1	0	0	0	13
<b>Total</b>	<b>245</b>	<b>842</b>	<b>2,347</b>	<b>1,839</b>	<b>1,266</b>	<b>939</b>	<b>663</b>	<b>159</b>	<b>23</b>	<b>2</b>	<b>0</b>	<b>8,325</b>

**TABLE A - 5  
DISTRIBUTION OF ACTIVE MEMBERS AS OF JUNE 30, 2012**

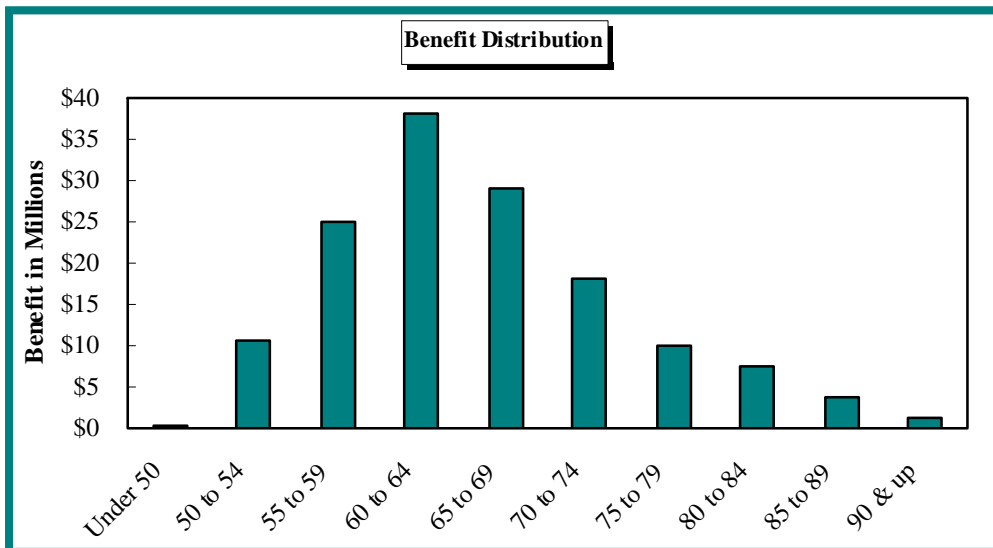
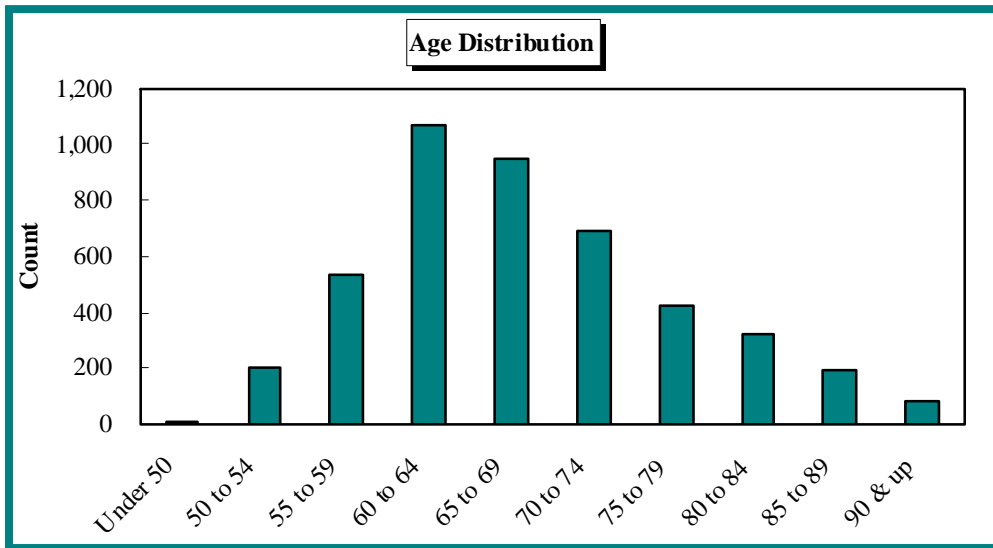
Age	Average Expected Salary										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	33,980	40,894	40,477	0	0	0	0	0	0	0	0	39,044
25 to 29	41,310	46,077	47,111	50,628	0	0	0	0	0	0	0	46,293
30 to 34	45,601	49,172	54,864	58,978	58,856	0	0	0	0	0	0	54,224
35 to 39	47,540	47,878	59,727	67,395	70,680	57,832	0	0	0	0	0	61,487
41 to 44	47,716	51,825	59,400	66,291	75,185	73,336	80,215	0	0	0	0	64,857
45 to 49	45,243	50,490	57,388	65,348	73,109	80,555	75,805	85,579	0	0	0	68,130
50 to 54	49,098	55,611	57,270	66,460	69,358	76,471	84,531	78,445	0	0	0	69,705
55 to 59	47,101	56,520	58,572	66,347	73,521	75,024	83,658	76,082	81,214	0	0	70,427
60 to 64	50,475	56,491	60,421	59,643	66,590	71,361	79,263	92,049	70,224	58,846	0	66,076
65 to 69	0	39,367	50,108	61,113	70,288	78,881	86,375	83,622	122,912	0	0	63,760
70 & up	0	0	67,274	77,186	49,281	72,750	79,977	66,125	0	0	0	68,866
<b>Total</b>	<b>44,955</b>	<b>49,451</b>	<b>56,731</b>	<b>65,156</b>	<b>71,879</b>	<b>76,429</b>	<b>81,548</b>	<b>79,931</b>	<b>81,017</b>	<b>58,846</b>	<b>0</b>	<b>64,522</b>

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**TABLE A - 6  
DISTRIBUTION OF RETIREES AS OF JUNE 30, 2012**

Age	Count	Annual Benefit
Under 50	4	\$ 161,354
50 to 54	204	10,415,813
55 to 59	534	24,995,255
60 to 64	1,068	38,022,147
65 to 69	945	28,886,255
70 to 74	689	17,992,919
75 to 79	418	10,016,668
80 to 84	325	7,330,126
85 to 89	189	3,605,500
90 & up	79	1,296,048
<b>Total</b>	<b>4,455</b>	<b>\$ 142,722,085</b>

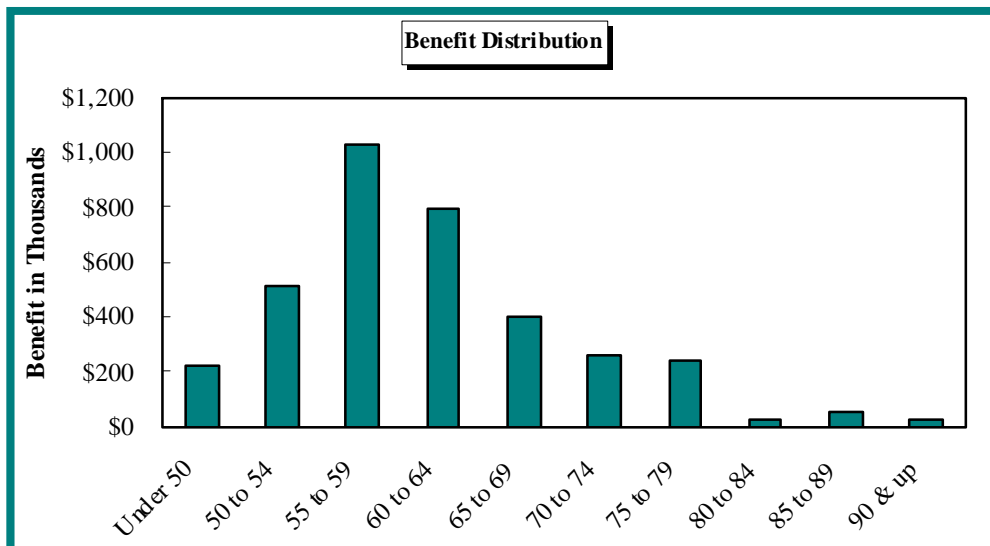
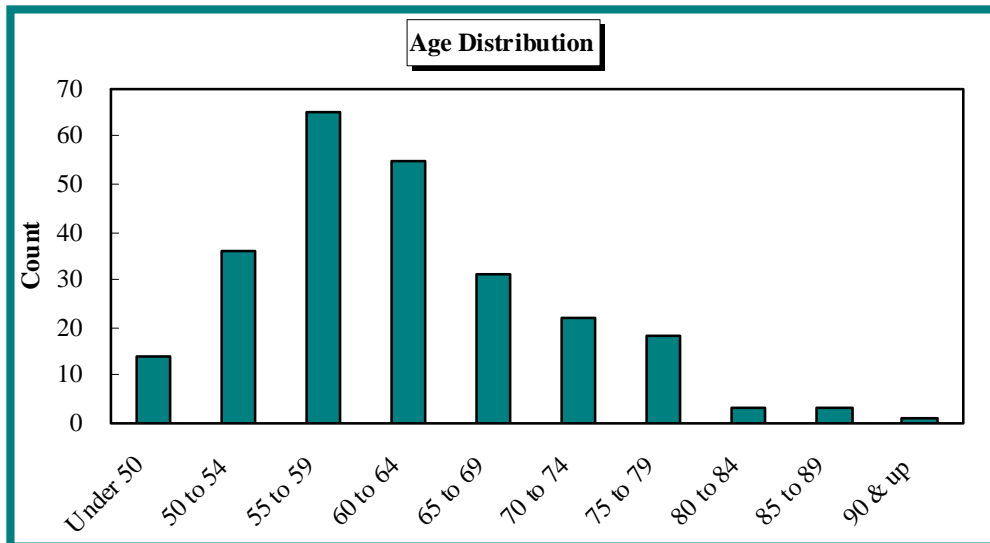


**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**TABLE A - 7  
DISTRIBUTION OF DISABLEDS AS OF JUNE 30, 2012**

Age	Count	Annual Benefit
Under 50	14	\$ 221,192
50 to 54	36	510,197
55 to 59	65	1,031,857
60 to 64	55	797,938
65 to 69	31	400,880
70 to 74	22	260,745
75 to 79	18	244,714
80 to 84	3	30,854
85 to 89	3	50,342
90 & up	1	22,278
<b>Total</b>	<b>248</b>	<b>\$ 3,570,997</b>

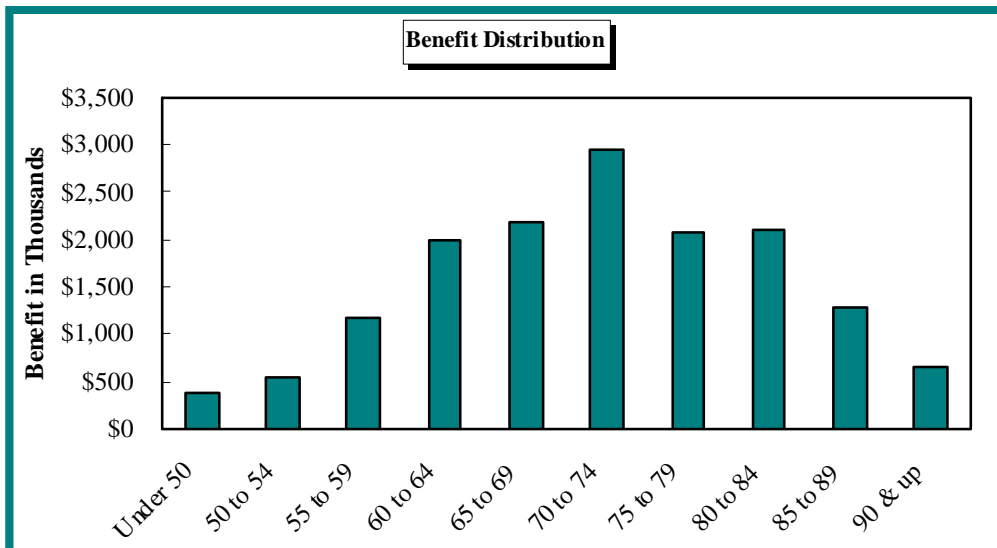
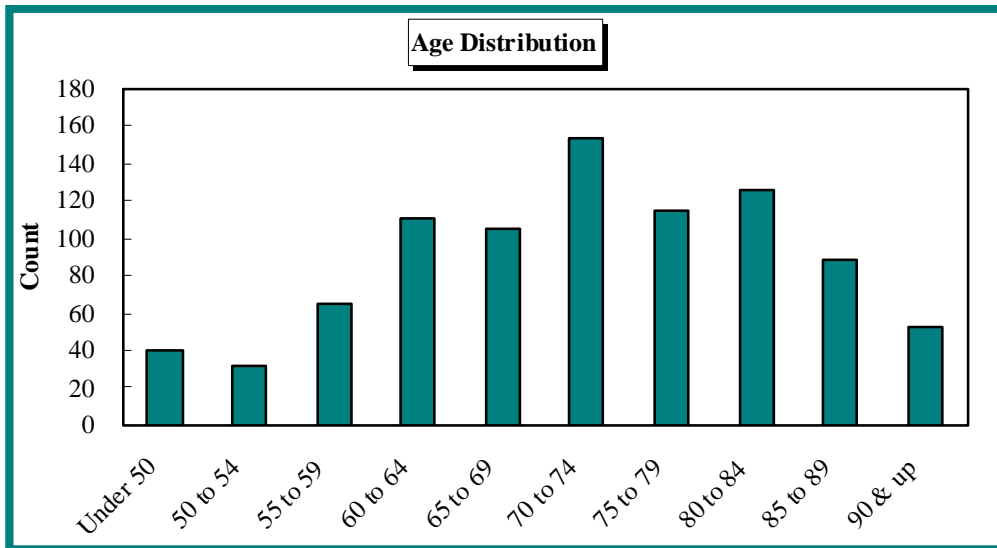


**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**TABLE A - 8  
DISTRIBUTION OF BENEFICIARIES & QDROS AS OF JUNE 30, 2012**

Age	Count	Annual Benefit
Under 50	40	\$ 375,314
50 to 54	32	551,022
55 to 59	65	1,160,215
60 to 64	110	1,986,167
65 to 69	105	2,180,100
70 to 74	153	2,946,401
75 to 79	114	2,084,560
80 to 84	126	2,092,530
85 to 89	88	1,277,583
90 & up	53	641,280
<b>Total</b>	<b>886</b>	<b>\$ 15,295,172</b>



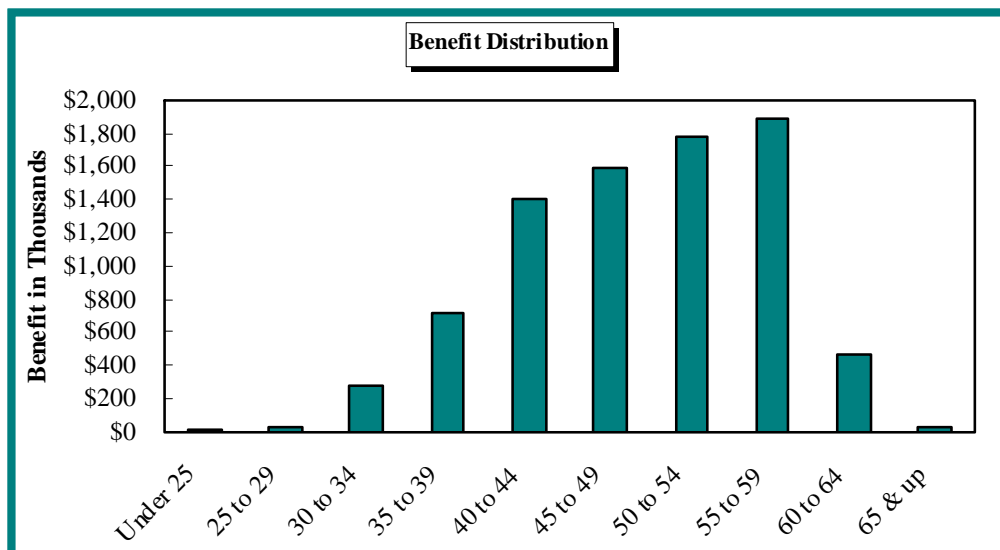
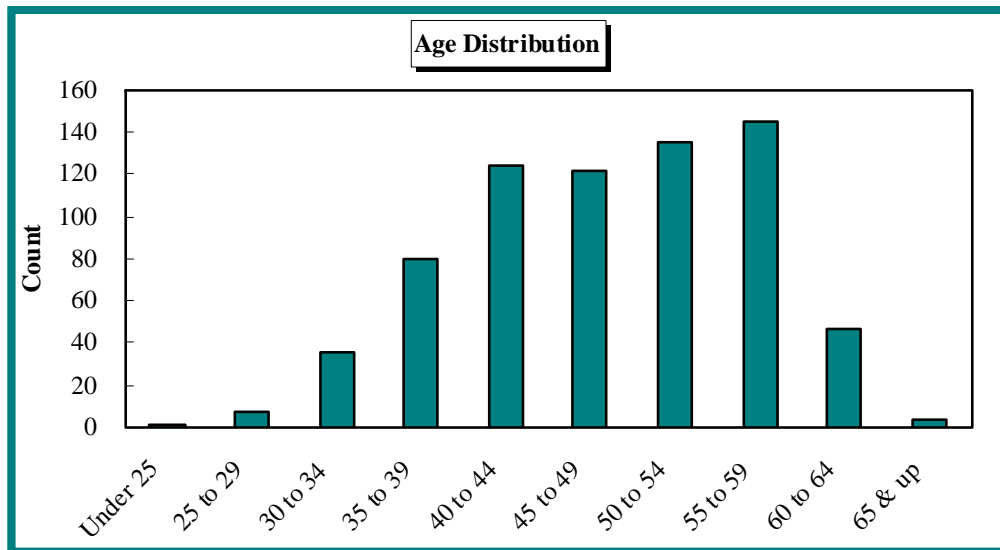


**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**TABLE A - 9  
DISTRIBUTION OF TERMINATED VESTEDS AS OF JUNE 30, 2012**

Age	Count	Annual Benefit
Under 25	1	\$ 5,141
25 to 29	7	34,669
30 to 34	35	273,552
35 to 39	80	710,248
40 to 44	124	1,396,288
45 to 49	121	1,595,203
50 to 54	135	1,771,552
55 to 59	145	1,885,027
60 to 64	46	464,876
65 & up	3	21,453
<b>Total</b>	<b>697</b>	<b>\$ 8,158,009</b>



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**TABLE A - 10  
DATA RECONCILIATION FROM JUNE 30, 2011 TO JUNE 30, 2012**

	Actives	Terminated			QDROs	Disabled	Spouses	Total
		Vested	Retired					
1. June 30, 2011 valuation	8,569	680	4,197		103	247	747	14,543
2. Additions								
a. New entrants	272							272
b. New beneficiary/QDRO				11			68	79
c. Total	272			11			68	351
3. Reductions								
a. Terminated - not vested	(134)							(134)
b. Lump sum								
c. Benefits expired							(1)	(1)
d. Deaths	(15)	(1)	(107)	(2)	(14)		(35)	(174)
e. Total	(149)	(1)	(107)	(2)	(14)		(36)	(309)
4. Changes in status								
a. Terminated - vested	(86)	86						
b. Returned to work	11	(11)						
c. Retired	(287)	(32)	319					
d. Disabled	(5)	(10)				15		
e. Data corrections		(15)	46				(5)	26
f. Total	(367)	18	365			15	(5)	26
5. June 30, 2012 valuation	8,325	697	4,455		112	248	774	14,611

**TABLE A - 11  
SCHEDULE OF RETIREES ADDED TO AND REMOVED FROM ROLLS**

Year Ended	Added to Rolls			Removed		Total		Average Annual Pensions	% Increase in Annual Pensions
	Count	Annual Pensions		Count	Annual Pensions	Count	Annual Pensions		
		New	PER (a)						
6/30/2012	448	\$14,488	-	161	\$4,174	5,478	\$160,264	\$29,256	6.9%
6/30/2011	444	15,251	-	184	3,574	5,191	149,950	28,887	8.4
6/30/2010	432	15,139	120	170	3,206	4,931	138,273	28,042	9.5
6/30/2009	426	14,195	1,594	174	3,002	4,669	126,220	27,034	11.3
6/30/2008	348	10,935	2,874	148	2,732	4,417	113,433	25,681	10.8
6/30/2007	290	8,205	1,519	142	2,165	4,217	102,356	24,272	8.0
6/30/2006	309	9,247	1,976	147	2,144	4,069	94,797	23,297	9.0
6/30/2005	314	7,795	1,159	150	2,554	3,907	85,718	21,940	8.1
6/30/2004	296	7,610	1,727	145	2,122	3,743	79,318	21,191	9.1
6/30/2003	259	6,720	1,066	124	1,935	3,592	72,221	20,106	8.8

(a) Pension Equalization Increases

Note: The dollar amounts of the pensions added to and removed from the rolls for years prior to June 30, 2011 were determined by the prior actuary. The amounts added to the rolls includes additions and deletions due to PER increases, in addition to the annual pensions for new retirees.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**TABLE A - 12  
SCHEDULE OF RETIRED MEMBERS BY TYPE OF BENEFIT**

Monthly Benefit	Number of Retirees	Type of Retirement						
		Deferred	Normal or Voluntary	Duty Disability	Non-Duty Disability	Survivor Payment	Death Benefit	Alternate Payee
Deferred	697	697	-	-	-	-	-	-
\$1 - \$300	84	-	45	1	-	11	15	12
301 - 400	151	-	93	7	2	39	3	7
401 - 500	124	-	74	9	5	25	2	9
501 - 600	137	-	87	5	9	25	6	5
601 - 700	156	-	86	5	11	47	6	1
701 - 800	167	-	88	3	14	36	12	14
801 - 900	165	-	97	4	20	36	6	2
901 - 1,000	167	-	88	3	15	45	8	8
1,001 - 1,100	185	-	116	4	15	33	9	8
1,101 - 1,200	158	-	97	1	17	26	8	9
1,201 - 1,300	155	-	104	1	14	22	4	10
1,301 - 1,400	154	-	110	1	10	22	9	2
1,401 - 1,500	160	-	111	4	5	26	8	6
1,501 - 2,000	698	-	553	13	25	69	23	15
2,001 - 2,500	732	-	637	1	12	66	12	4
2,501 - 3,000	566	-	518	-	6	31	11	-
3,001 - 4,000	785	-	735	-	4	37	9	-
4,001 - 5,000	434	-	419	-	2	12	1	-
Over 5,001	411	-	397	-	-	11	3	-
Totals	6,286	697	4,455	62	186	619	155	112

**TABLE A - 13  
SCHEDULE OF RETIRED MEMBERS BY BENEFIT OPTION**

Monthly Benefit	Total	Option Selected*						
		Life	Option A		Option B		Option C	Child Benefit
			Standard	Pop-Up	Standard	Pop-Up		
\$1 - \$300	84	39	20	6	-	-	4	15
301 - 400	151	98	27	8	2	5	11	-
401 - 500	124	80	29	7	1	-	7	-
501 - 600	137	79	25	17	3	2	11	-
601 - 700	156	94	31	16	2	5	8	-
701 - 800	167	107	27	19	3	3	8	-
801 - 900	165	88	30	19	4	11	13	-
901 - 1,000	167	110	27	19	6	3	2	-
1,001 - 1,100	185	113	40	15	4	4	9	-
1,101 - 1,200	158	78	48	14	2	10	6	-
1,201 - 1,300	155	75	38	19	6	12	5	-
1,301 - 1,400	154	83	35	14	5	12	5	-
1,401 - 1,500	160	93	24	18	6	15	4	-
1,501 - 2,000	698	302	196	92	27	45	36	-
2,001 - 2,500	732	311	207	90	27	70	27	-
2,501 - 3,000	566	225	147	80	37	52	25	-
3,001 - 4,000	785	311	238	92	31	77	36	-
4,001 - 5,000	434	174	117	52	26	52	13	-
Over 5,001	411	167	127	46	21	33	17	-
Totals	5,589	2,627	1,433	643	213	411	247	15
Deferred	697							
Total	6,286							

\* Beneficiaries of members who selected Option C are listed under the Option C column. All other beneficiaries are listed under the Life column.

**APPENDIX B  
ACTUARIAL ASSUMPTIONS AND METHODS**

**Actuarial Assumptions**

**1. Investment Return Assumption**

Assets are assumed to earn an 8.0% annual return net of investment and administrative expenses. The plan provides for retiree cost of living increases based on the availability of excess returns. The current assumptions adopted by the Board do not explicitly provide for the cost of such benefits and are therefore implicitly provided for in the investment return assumption.

**2. Salary Increase Rate**

Individual salary increases are composed of an inflation component, a real wage growth component, plus merit or longevity increases that vary by age.

Price inflation component:	4.50%
Real wage growth component:	<u>0.50%</u>
Payroll growth rate:	5.00%

The table below combines the various components of salary increases for sample ages. The below assumption was adopted June 28, 2000.

Age	Price Inflation	Real Wage Growth	Merit or Longevity	Total
20	4.50%	0.50%	3.80%	8.80%
25	4.50%	0.50%	3.10%	8.10%
30	4.50%	0.50%	2.70%	7.70%
35	4.50%	0.50%	2.40%	7.40%
40	4.50%	0.50%	2.20%	7.20%
45	4.50%	0.50%	1.60%	6.60%
50	4.50%	0.50%	1.10%	6.10%
55	4.50%	0.50%	0.60%	5.60%
60	4.50%	0.50%	0.10%	5.10%
65	4.50%	0.50%	0.00%	5.00%

**APPENDIX B  
ACTUARIAL ASSUMPTIONS AND METHODS**

**3. Rates of Mortality for Healthy and Disabled Lives**

Mortality rates for actives, retirees, beneficiaries, and terminated vested members are based on the male and female RP-2000 combined employee and annuitant mortality tables. While there is no explicit adjustment to the table to reflect expected future mortality improvements, the latest experience study (2009) showed actual to expected ratios of 113% for males and 119% for females indicating some margin for future mortality improvements. Sample rates of mortality are shown in the table below. These rates were adopted November 17, 2005 and first used for the June 30, 2006 valuation.

<b>Rates of Mortality for Active and Retired Healthy and Disabled Lives at Selected Ages</b>		
<b>Age</b>	<b>Male</b>	<b>Female</b>
25	0.0376%	0.0207%
30	0.0444	0.0264
35	0.0773	0.0475
40	0.1079	0.0706
45	0.1508	0.1124
50	0.2138	0.1676
55	0.3624	0.2717
60	0.6747	0.5055
65	1.2737	0.9706
70	2.2206	1.6742
75	3.7834	2.8106
80	6.4368	4.5879
85	11.0757	7.7446
90	18.3408	13.1682
95	26.7491	19.4509

**4. Family Composition**

Percentage married is shown in the following table. Females are assumed to be three years younger than males.

<b>Percentage Married</b>	
<b>Gender</b>	<b>Percentage</b>
Males	90%
Females	90%

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX B  
ACTUARIAL ASSUMPTIONS AND METHODS**

**5. Rates of Termination**

Sample rates of termination are shown below. These rates were adopted November 17, 2005 and first used for the June 30, 2006 valuation.

<b>Rates of Termination*</b>		
<b>Age</b>	<b>Years of Service</b>	<b>Termination</b>
All	0	20.0%
All	1	18.0
All	2	12.0
All	3	9.0
All	4	8.0
25	5+	7.0
30	5+	6.0
35	5+	5.0
40	5+	3.0
45	5+	3.0
50+	5+	2.5

*\* Termination rates do not apply once a member is eligible for retirement*

**6. Rates of Disability**

Sample disability rates of active members are provided in the table below. These rates were first used for the June 30, 2006 valuation.

<b>Rates of Disability</b>	
<b>Age</b>	<b>Disability</b>
20	0.03%
25	0.03
30	0.04
35	0.05
40	0.12
45	0.20
50	0.40
55	0.80
60	1.00

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2012 ACTUARIAL VALUATION**

**APPENDIX B  
ACTUARIAL ASSUMPTIONS AND METHODS**

**7. Rates of Retirement**

Rates of retirement are based on age according to the following table. These rates were adopted November 17, 2005 and first used for the June 30, 2006 valuation.

<b>Rates of Retirement</b>	
<b>Age</b>	<b>Retirement</b>
50 – 54	25.00%
55	35.00
56 – 60	25.00
61	20.00
62	35.00
63	30.00
64	25.00
65	45.00
66 – 69	30.00
70+	100.00

**8. Unused Vacation and Compensatory Time**

Compensatory service credits and lump sum payments for unused vacation and compensatory time were assumed to increase the present value of normal retirement benefits by 9.0%.

**9. Benefits Not Valued**

Future benefits payable through the Pension Equalization Reserve (PER) were not explicitly valued. If the COPERS' assets earn exactly 8.0% each year, no future benefits will be payable through the PER. However, if the five-year arithmetic average return exceeds 8.0%, additional benefits that are not valued will be payable. Assets already transferred to the PER, but not converted to additional benefits are excluded from valuation assets. These benefits may be implicitly valued under this approach if the true investment assumption is higher than 8.0%.

The Board is considering our recommendation that the PER be explicitly valued. However, for this first valuation performed by Cheiron, the Board has elected to continue the prior practice in order to allow sufficient time for the Board to consider the appropriate assumptions and methods to include the PER in future valuations.

**10. Changes Since Last Valuation**

The Board has not adopted any changes in actuarial assumptions since the last actuarial valuation.

**APPENDIX B**  
**ACTUARIAL ASSUMPTIONS AND METHODS**

**Actuarial Methods**

**1. Actuarial Cost Method**

The Entry Age actuarial cost method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each member's date of entry and assumed retirement. The actuarial liability is the difference between the present value of future benefits and the present value of future normal cost. The unfunded actuarial liability is the difference between the actuarial liability and the funding value of assets.

**2. Asset Valuation Method**

For the purposes of determining the employer's contribution, a funding value of assets is used that dampens the volatility in market values that occur because of the fluctuations in market conditions and excludes amounts transferred to the Pension Equalization Reserve. Use of an asset smoothing method reduces the volatility of contribution rates and is consistent with the long-term process of funding a pension plan.

The actuarial value of assets is calculated by recognizing the deviation of actual investment returns compared to the expected return (8.00%) on the actuarial value of assets over a four-year period. The dollar amount of the expected return on the actuarial value of assets is determined using the actual contributions and benefit payments during the year. Any difference between this amount and the actual net investment earnings is considered a gain or loss. The funding value of assets equals the actuarial value of assets less the amount in the PER.

**3. Amortization Method**

The entire unfunded actuarial liability is amortized over a 20-year open period as a level percentage of expected payroll. Payroll is expected to increase 5.0% each year.



**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

**1. Membership**

Full time employees of the City of Phoenix other than police officers or firefighters who are covered by another retirement system to which the City contributes.

**2. Final Average Compensation (FAC)**

Average of annual compensation for the period of 3 consecutive years producing the highest average and contained within the last 10 years preceding retirement.

**3. Credited Service**

A member is credited with a month of service for each calendar month in which the employee performs at least 10 days of City service. A member is credited with a year of service for any calendar year in which the employee has at least 10 months of credited service.

**4. Voluntary Retirement (no reduction for age)**

*Eligibility:*

Sum of age and credited service equals 80 or more, age 60 with 10 or more years of credited service or age 62 with 5 or more years of credited service.

*Annual Benefit:*

Unused sick leave service multiplied by 2% of FAC plus 2% of FAC times credited service up to 32.5 years plus 1% of FAC times service in excess of 32.5 years plus ½% of FAC times service in excess of 35.5 years. Minimum monthly pension is \$250 (\$500 if member has 15 or more years of service).

**5. Deferred Retirement**

*Eligibility:*

Termination of City employment prior to age 62 with 5 or more years of credited service.

*Annual Benefit:*

Accrued regular retirement amount based on credited services, unused sick leave service, and FAC at time of termination, payable beginning at age 62.

**6. Duty Disability Retirement**

*Eligibility:*

Total and permanent disability incurred in line of duty with the City.

*Annual Benefit:*

Computed in the same manner as the regular retirement amount based on FAC and credited service at time of disability retirement. Minimum is 15% of FAC. Maximum during worker's compensation period is difference between final compensation and

**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

annualized workers compensation. At expiration of worker's compensation period, amount is recomputed to include years during which workers compensation was paid.

**7. Non-Duty Disability**

*Eligibility:*

Total and permanent disability after 10 or more years of credited service.

*Annual Benefit:*

Computed in the same manner as the regular retirement amount based on FAC and credited service at time of disability retirement.

**8. Duty Death Before Retirement**

*Eligibility:*

Death in line of duty with the City and compensable under worker's compensation.

*Annual Benefit:*

To the spouse: Joint and 100% survivor actuarial equivalent of accrued regular retirement amount based on FAC and credited service and unused sick leave service at time of death. Minimum of 10 years of service is credited. To the children of a deceased member with 10 or more years of credited service: each child shall receive a monthly pension of \$200 until adoption, marriage, death or attainment of age 18.

**9. Non-Duty Death Before Retirement**

*Eligibility:*

10 or more years of credited service.

*Annual Benefit:*

Same as Duty Death Before Retirement.

**10. Pension Equalization Reserve (PER)**

The PER is credited with Excess Earnings, if any, each calendar year. Excess Earnings are defined as the excess over 8.0% of the annual average of the time-weighted rates of return for the immediately preceding five calendar years. The amounts credited to the PER are either used to fund percentage increases to pension amounts or one-time post retirement distribution benefits (13th checks).

On January 1 of each year, persons in receipt of a pension for at least 36 months receive a percentage increase based on the lesser of:

- i. Phoenix area Consumer Price Index (CPI) and
- ii. The amount the balance in the PER can fully fund.

**APPENDIX C**  
**SUMMARY OF PLAN PROVISIONS**

The increase, subject to the availability of funds in the PER, is payable beginning with the April 1 payment each year, retroactive to January 1 of the same year.

Also, after each plan year's return is known, all pensioners (excluding minors) as of the end of the plan year are eligible to receive a one-time post retirement distribution (13th check). The 13th check is a percentage of the pensioner's annual benefits based on the lesser of:

- i. One half of the Phoenix area Consumer Price Index (CPI) and
- ii. The excess of the rate of return over the assumed interest rate

The percentage cannot be more than three percent, but must at least be one percent and is subject to the availability of funds in the PER. The 13th check is payable on December 1.

**11. Member Contributions**

5% of pay

**12. City Contributions**

Actuarially determined amounts which, together with members contributions, are sufficient to cover both (i) normal costs of the plan, and (ii) financing of unfunded accrued actuarial costs over a selected period of future years.

**Note: The summary of plan provisions is designed to outline principal plan benefits. If COPERS should find the plan summary not in accordance with the actual provisions, the actuary should immediately be alerted so the proper provisions are valued.**

**APPENDIX D  
GLOSSARY OF TERMS**

**1. Actuarial Liability**

The Actuarial Liability is the difference between the present value of all future Plan benefits and the present value of total future normal costs. This is also referred to by some actuaries as the “accrued liability” or “actuarial accrued liability”.

**2. Actuarial Assumptions**

Estimates of future experience with respect to rates of mortality, disability, turnover, retirement rate or rates of investment income and salary increases. Actuarial 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. Accrued Service**

Service credited under the Plan which was rendered before the date of the actuarial valuation.

**4. Actuarial Equivalent**

A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.

**5. Actuarial Funding Method**

A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of a retirement Plan benefit between future normal cost and actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**6. Actuarial Gain (Loss)**

The difference between actual experience and actuarial assumption anticipated experience during the period between two actuarial valuation dates.

**7. Actuarial Present Value**

The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payment.

**APPENDIX D  
GLOSSARY OF TERMS**

**8. Amortization**

Paying off an interest-discounted amount with periodic payments of interest and principal—as opposed to paying off with a lump sum payment.

**9. Annual Required Contribution (ARC) under GASB 25**

The Governmental Accounting Standards Board (GASB) Statement No. 25 defines the Plan Sponsor's "Annual Required Contribution" (ARC) that must be disclosed annually. The City of Phoenix Employees' Retirement System computed contribution rate for FYE 2013 meets the parameters of GASB 25.

**10. Normal Cost**

The actuarial present value of retirement Plan benefits allocated to the current year by the actuarial funding method.

**11. Unfunded Actuarial Liability (UAL)**

The unfunded actuarial liability represents the difference between actuarial liability and the actuarial value of assets. This value is sometimes referred to as "unfunded actuarial accrued liability."

Most retirement Plans have unfunded actuarial liabilities. They typically arise each time new benefits are added and each time experience losses are realized.

The existence of unfunded actuarial liability is not in itself an indicator of poor funding. Also, unfunded actuarial liabilities do not represent a debt that is payable today. What is important is the ability of the plan sponsor to amortize the unfunded actuarial liability and the trend in its amount (after due allowance for devaluation of the dollar).