



**City of Phoenix Employees'  
Retirement System**

**Actuarial Valuation Report  
as of  
June 30, 2014**

**Produced by **Cheiron****

**November 2014**

## Table of Contents

Letter of Transmittal .....	i
Section I – Board Summary .....	1
Section II – Certification.....	13
Section III - Assets.....	14
Section IV – Measures of Liability for Funding.....	17
Section V – Contributions.....	23
Section VI – Accounting and Financial Reporting under GASB 67 and 68 .....	26
Section VII – Actuarial Section of the CAFR .....	34
Appendix A – Membership Information.....	37
Appendix B – Actuarial Assumptions and Methods.....	46
Appendix C – Summary of Plan Provisions .....	52
Appendix D – Glossary of Terms .....	56

## LETTER OF TRANSMITTAL

November 18, 2014

Board of Retirement  
City of Phoenix Employees' Retirement System  
200 W. Washington Street, 10th Floor  
Phoenix, Arizona 85003

Dear Members of the Board:

The purpose of this report is to present the June 30, 2014 actuarial valuation of the City of Phoenix Employees' Retirement System (COPERS), including both information related to the funding of COPERS and accounting and financial disclosure information under the Governmental Accounting Standards Board Statements Nos. 67 and 68 (GASB 67 and 68). The report includes:

- Measures of funded status and Net Pension Liability (NPL),
- Analysis of changes since the prior valuation,
- Development of City and member contribution rates for the fiscal year ending (FYE) June 30, 2016,
- Development of the Annual Pension Expense for the City of Phoenix, and
- Historical and projected trends.

Although the City of Phoenix is not required to report under GASB 68 until June 30, 2015, we have included information under GASB 68 as of the measurement date of June 30, 2014 in the event the City either elects to implement GASB 68 early or elects to use a June 30, 2014 measurement date for its reporting date of June 30, 2015.

If you have any questions about the report or would like additional information, please let us know.

Sincerely,  
Cheiron



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



Elizabeth Wiley, FSA, FCA, EA, MAAA  
Consulting Actuary



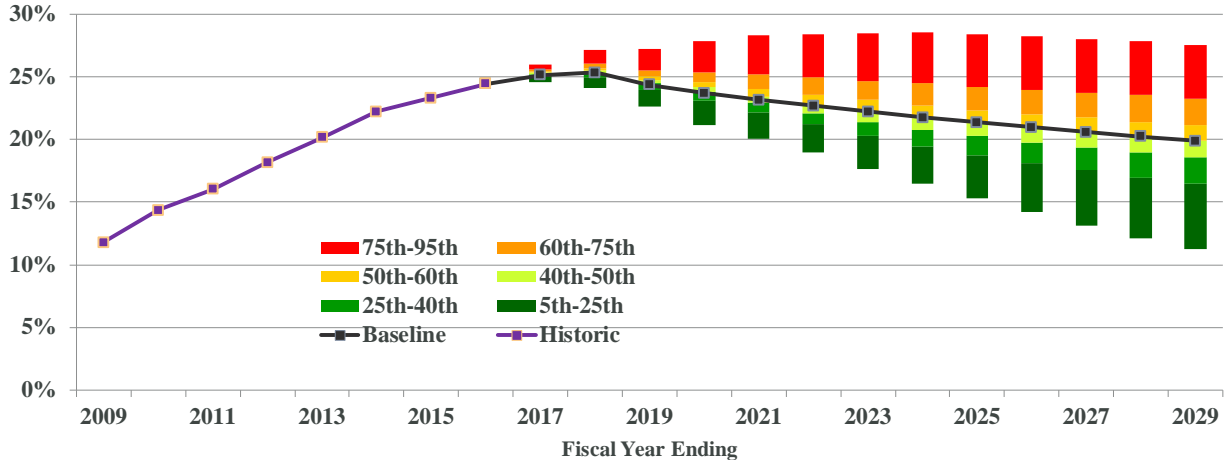
**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

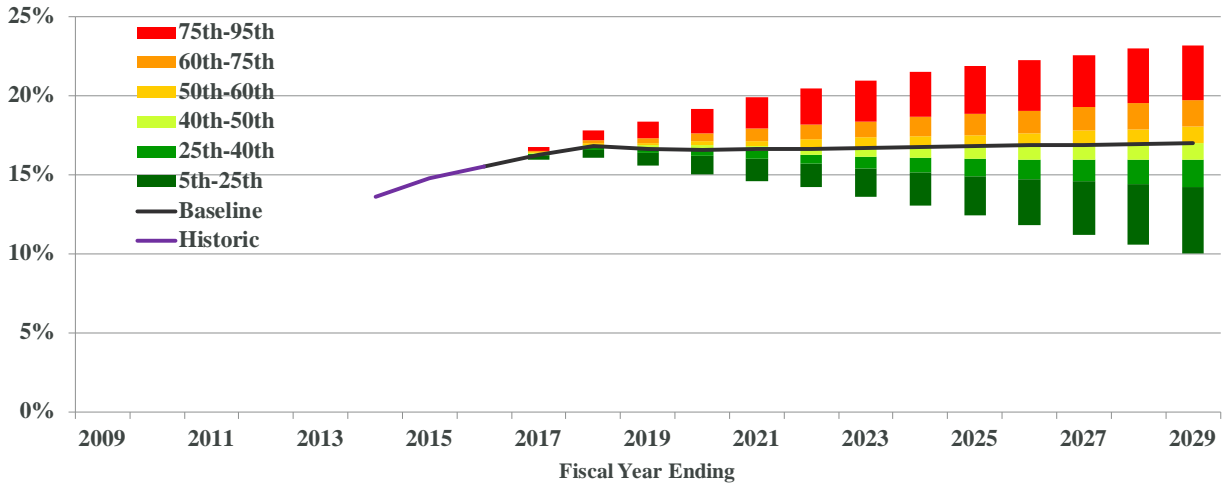
Highlights of this report are summarized in the tables and graphs below.

<u>Contributions</u>			<b>Actuarial Liability</b>	<u>Funding Status</u>		
	Fiscal Year Ending			Valuation Date		
	2016	2015		6/30/2014	6/30/2013	
Tier 1 EE Rate	5.00%	5.00%		Actuarial Liability	\$ 3,615	\$ 3,479
Tier 2 EE Rate	15.51%	14.80%		Market Value of Assets	2,222	1,966
City Rate	24.46%	23.30%		<b>UAL - Market Value</b>	<b>\$ 1,393</b>	<b>\$ 1,514</b>
Normal Cost Rate	14.91%	15.24%		Funded Percentage	61.5%	56.5%
Interest on MV UAL	20.51%	21.59%		Actuarial Value of Assets	2,121	1,963
Additional UAL Rate	-4.41%	-7.23%		<b>UAL - Actuarial Value</b>	<b>\$ 1,494</b>	<b>\$ 1,517</b>
Total UAL Rate	16.10%	14.36%		Funded Percentage	58.7%	56.4%
<b>Total Rate</b>	<b>31.01%</b>	<b>29.60%</b>				
						<i>Amounts in Millions</i>

**Projected City Contribution Rates**



**Projected Tier 2 Employee Contribution Rates**



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

**Assets and Liabilities**

This report measures assets and liabilities both for funding purposes and for financial reporting purposes. For many pension plans, the basis for these measures differs, but for the City of Phoenix Employees' Retirement System (COPERS), the measures are the same except for the use of a smoothed value of assets to develop contribution rates for funding purposes. Table I-1 below compares the assets, liabilities, unfunded actuarial liability (UAL), and funding ratios between June 30, 2014 and June 30, 2013, after accounting for the assumption changes adopted by the Board in September 2013.

<b>Table I - 1</b>				
<b>Assets And Liabilities</b>				
<b>Item</b>	<b>June 30, 2014</b>	<b>June 30, 2013 <sup>1</sup></b>	<b>% Change</b>	
Actuarial Liability				
Actives	\$ 1,459.0	\$ 1,546.1		-5.6%
Terminated Vesteds	56.5	52.2		8.1%
In Pay Status	<u>2,099.3</u>	<u>1,881.1</u>		11.6%
Total Actuarial Liability	\$ 3,614.8	\$ 3,479.4		3.9%
Market Value of Assets (MVA)	\$ 2,222.2	\$ 1,965.6		13.1%
Actuarial Value of Assets (AVA)	\$ 2,120.7	\$ 1,962.5		8.1%
UAL -MVA Basis	\$ 1,392.5	\$ 1,513.8		-8.0%
UAL - AVA Basis	\$ 1,494.1	\$ 1,516.9		-1.5%
Funding Ratio - MVA Basis	61.5%	56.5%		8.8%
Funding Ratio - AVA Basis	58.7%	56.4%		4.0%
Expected Payroll	\$ 509.3	\$ 526.0		-3.2%
Asset Leverage Ratio	4.4	3.7		16.8%
Actuarial Liability Leverage Ratio	7.1	6.6		7.3%
Interest on UAL - MVA Basis	\$ 104.4	\$ 113.5		-8.0%
Interest Cost	20.5%	21.6%		-5.0%

<sup>1</sup> Based on September 2013 Assumptions presented in the June 30, 2013 report.

*Dollar amounts in millions*

For funding purposes, the actuarial liability represents the targeted amount of assets as of the valuation date according to the actuarial cost method. Shortfalls or surpluses in assets compared to the actuarial liability are made up over a period of time through increases or reduction in contributions. Since COPERS uses the same actuarial cost method for funding as is required by

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

GASB 67 for financial reporting and the discount rate is also the same, the Total Pension Liability (TPL) under GASB 67 is identical to the actuarial liability.

As of June 30, 2014, approximately 58% of the actuarial liability is for members who are currently receiving benefits compared to 54% in the prior valuation. The actuarial liability for active members decreased 5.6% while it increased for retirees by 11.6%. Payroll for active members also decreased by 3.2%. All of these changes contribute to make the payments on the UAL a larger percentage of payroll and to make contribution rates more sensitive to future gains and losses.

For financial reporting purposes under GASB 67, the Plan's Fiduciary Net Position (FNP) is equal to the market value of assets and the Net Pension Liability (NPL) is equal to the UAL based on that FNP. On this basis, COPERS increased its funded ratio from 56.5% as of June 30, 2013 to 61.5% as of June 30, 2014. The NPL decreased from \$1.51 billion on June 30, 2013 to \$1.39 billion on June 30, 2014.

For funding purposes, COPERS calculates an actuarial value of assets that recognizes gains and losses compared to the expected investment returns over a four-year period. For this year, the actuarial value of assets increased by 10.3% compared to the 15.4% increase in the market value. The ratio of the actuarial value of assets to the market value of assets decreased from 99.8% to 95.4%, indicating that the deferred gains are greater than the deferred losses. Finally, the UAL based on the actuarial value of assets (AVA) decreased from \$1.52 billion to \$1.49 billion; and the funded ratio based on AVA increased from 56.4% to 58.7%.

The asset leverage ratio is calculated as the market value of assets divided by payroll and measures the sensitivity of COPERS to investment gains and losses. A ratio of 4.4 means that a 10% investment loss (compared to the assumed rate of return) is equivalent to a loss of 44% of payroll. Last year a 10% investment loss would have only cost 37% of payroll. The actuarial liability leverage shows what the asset leverage ratio would be if COPERS was 100% funded. The increase from 6.6 to 7.1 is partly the normal progression as a plan matures, but the growth is larger this year due to the reduction in active payroll.

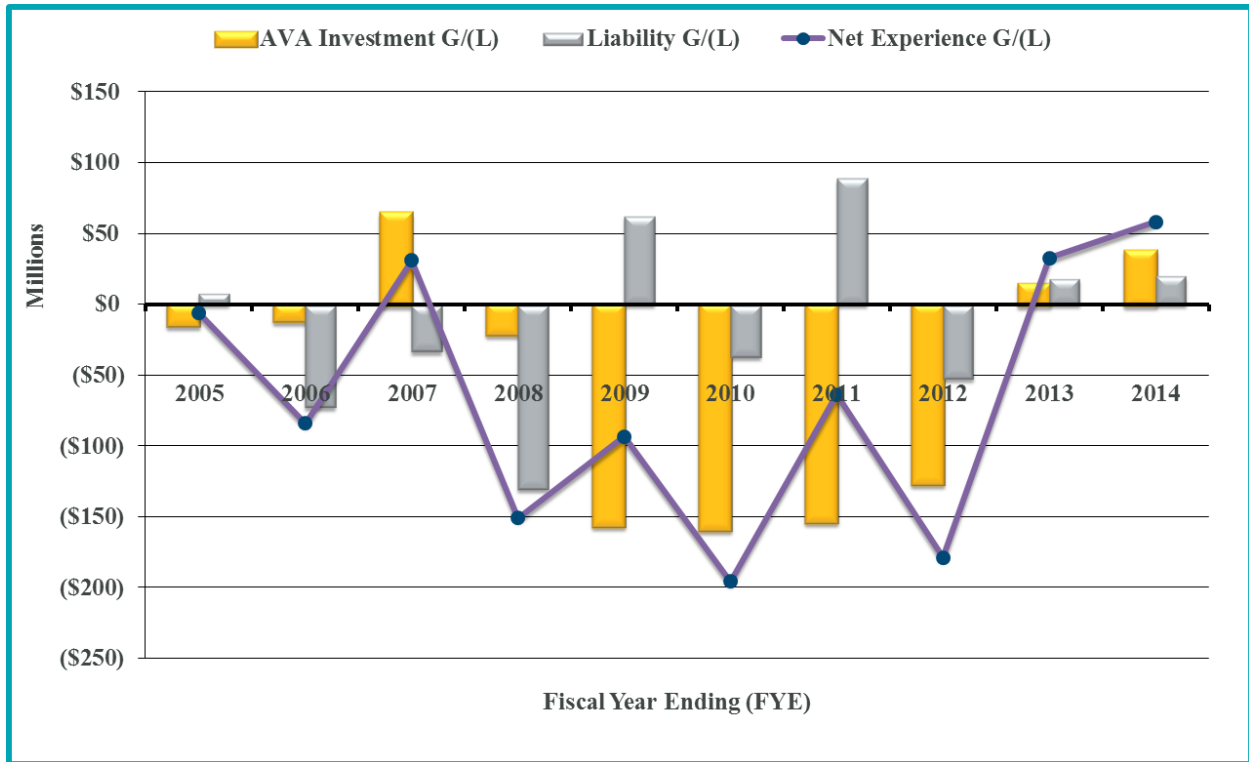
The interest cost on the UAL ( $7.5\% \times \text{UAL} \div \text{payroll}$ ) has declined from 21.6% of payroll to 20.5% of payroll. Since the UAL payment of 16.1% of payroll is less than the interest on the UAL, the UAL is expected to grow in the next year. Once the amortization payment on the assumption changes is fully phased-in and the amortization period shortens, the UAL payment will exceed the interest cost and the current UAL will be paid off in 24 years.

The chart below shows COPERS' historical 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.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

**Chart I-1: COPERS Historical Gain/(Loss) 2005-2014**



The investment losses (gold bars) from 2009 have been recognized in the succeeding four years. Because the actuarial value of assets is now less than the market value of assets, the impact of any investment losses over the next few years will be offset by the recognition of recent gains on the market value of assets.

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.

**Membership**

As shown in Table I-2 below, total membership grew 0.9% from 2013 to 2014, but the changes within categories of membership were significant. Active membership decreased 4.4%, terminated vested membership increased 3.6%, and service retiree membership increased 9.2%. Total payroll decreased by 3.2%, and the average pay per active member increased by 0.9%. These changes explain, in part, the changes in the measure of liability and the changes in contribution rates. For example, the reduction in active actuarial liability is primarily due to the reduction in the number of active members, and the contribution rate (not amount) is higher than it would have been due to the reduction in total active payroll.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

<b>Table I - 2</b>			
<b>Total Membership</b>			
<b>Item</b>	<b>June 30, 2014</b>	<b>June 30, 2013</b>	<b>% Change</b>
Active Members			
Tier 1	7,421	8,090	-8.3%
Tier 2	<u>310</u>	<u>0</u>	N/A
Total	7,731	8,090	-4.4%
Terminated Vesteds	816	788	3.6%
In Pay Status			
Service Retirees	5,080	4,653	9.2%
Disabled Retirees	249	246	1.2%
Beneficiaries	<u>961</u>	<u>925</u>	3.9%
Total	6,290	5,824	8.0%
Total Members	14,837	14,702	0.9%
Active Member Payroll	\$ 509.3	\$ 526.0	-3.2%
Average Pay per Active Member			
Actual for Prior Year	\$ 65,874	\$ 62,798	4.9%
Projected for Upcoming Year	\$ 65,873	\$ 65,014	1.3%
Annuities In Pay Status	\$ 189	\$ 170	11.2%

*Payroll and annuity amounts in millions*

## Contribution Rates

The total contribution rate equals the sum of the normal cost rate, the administrative expense rate, and the amortization payment on the UAL expressed as a percentage of total payroll. Normal cost rates are calculated separately for Tier 1 and Tier 2 members. The normal cost rate for COPERS is a weighted average of the Tier 1 and Tier 2 normal cost rates based on projected payroll for each Tier for the fiscal year to which the rates apply.

The UAL rate for fiscal year ending (FYE) 2016 consists of three components: the remainder of the UAL as of June 30, 2013 before assumption changes, the remainder of the UAL due to the September 2013 assumption changes, and the actuarial gain between June 30, 2013 and June 30, 2014. All of these components have 24 years remaining on their amortization period and are amortized as a level percentage of payroll assuming 3.5% increases in payroll each year. The amortization of the assumption changes, however, is in just the second year of a four-year phase-



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

in to the full amortization rate, so the payment on the amortization of the assumption changes is half of what it would be without the phase-in.

This amortization structure results in a total UAL rate of 16.1% of payroll for FYE 2016, which is less than the amount needed to pay the interest cost on the UAL (22.0% of payroll). As a result, the dollar amount of the UAL is expected to increase in the short term. As the phase-in is completed and the remaining amortization period shortens, the UAL rate will exceed the interest cost on the UAL and pay off the principal and interest by the end of the 24-year period.

Table I-3 below shows the primary sources for the change in the total contribution rate from the rate that was calculated in the prior report. The reduction in payroll caused an increase in the UAL rate although not in the dollar amount. This increase was offset by investment and demographic experience.

<b>Table I - 3</b>			
<b>Reconciliation Of Changes In Contribution Rate</b>			
	<b>Total Normal Cost</b>	<b>UAL Rate</b>	<b>Total Contribution Rate</b>
FYE 2015 Total Contribution Rate	15.24%	14.36%	29.60%
Expected FYE 2016 Total Contribution Rate	15.52%	15.76%	31.28%
<b><u>Changes Due to:</u></b>			
Reduction in total payroll	0.00%	1.08%	1.08%
Investment experience	0.00%	-0.48%	-0.48%
Demographic experience	-0.68%	-0.26%	-0.94%
Administrative expense assumption	0.07%	0.00%	0.07%
<b>FYE 2016 Total Contribution Rate</b>	<b>14.91%</b>	<b>16.10%</b>	<b>31.01%</b>

*Dollar amounts in millions*

For Tier 1, members contribute 5.0% of payroll, and the City contributes the remainder of the total contribution rate (26.01%). For Tier 2, members and the City each contribute half the total contribution rate (15.51%). Based on expected Tier 1 payroll of approximately \$449 million and expected Tier 2 payroll of approximately \$78 million, we expect the City's aggregate contribution rate to be approximately 24.5% of payroll for FYE 2016.

**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

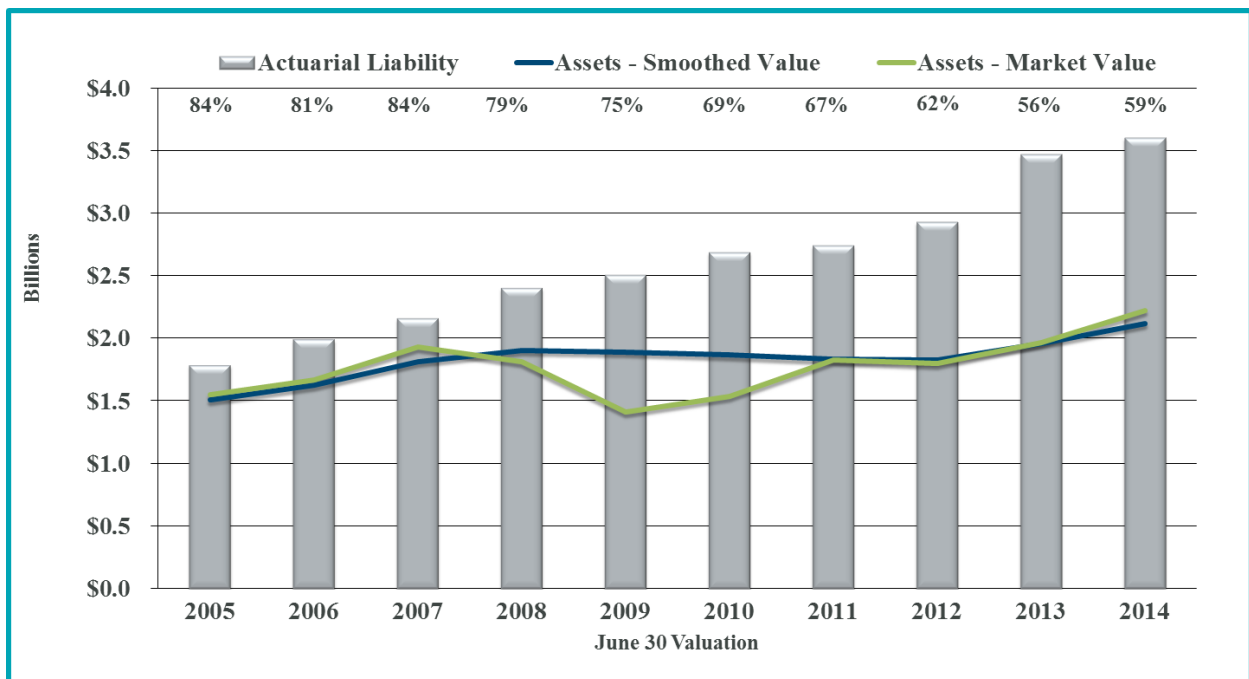
**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

important to remember that each valuation is merely a snapshot of the long-term progress of the System. 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 FYE 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, on the basis of the smoothed asset values, since 2005. From 2007 to 2014, the funding ratio has declined with most of the decrease attributable to the decline in the assets since 2008. The smoothed actuarial value of assets spread the investment losses from 2008-2009 over four years, but now those losses have been fully recognized and the market value of assets, the green line, now exceeds the smoothed value of assets, the blue line.

**Chart I-2: COPERS Assets and Liabilities 2005-2014**



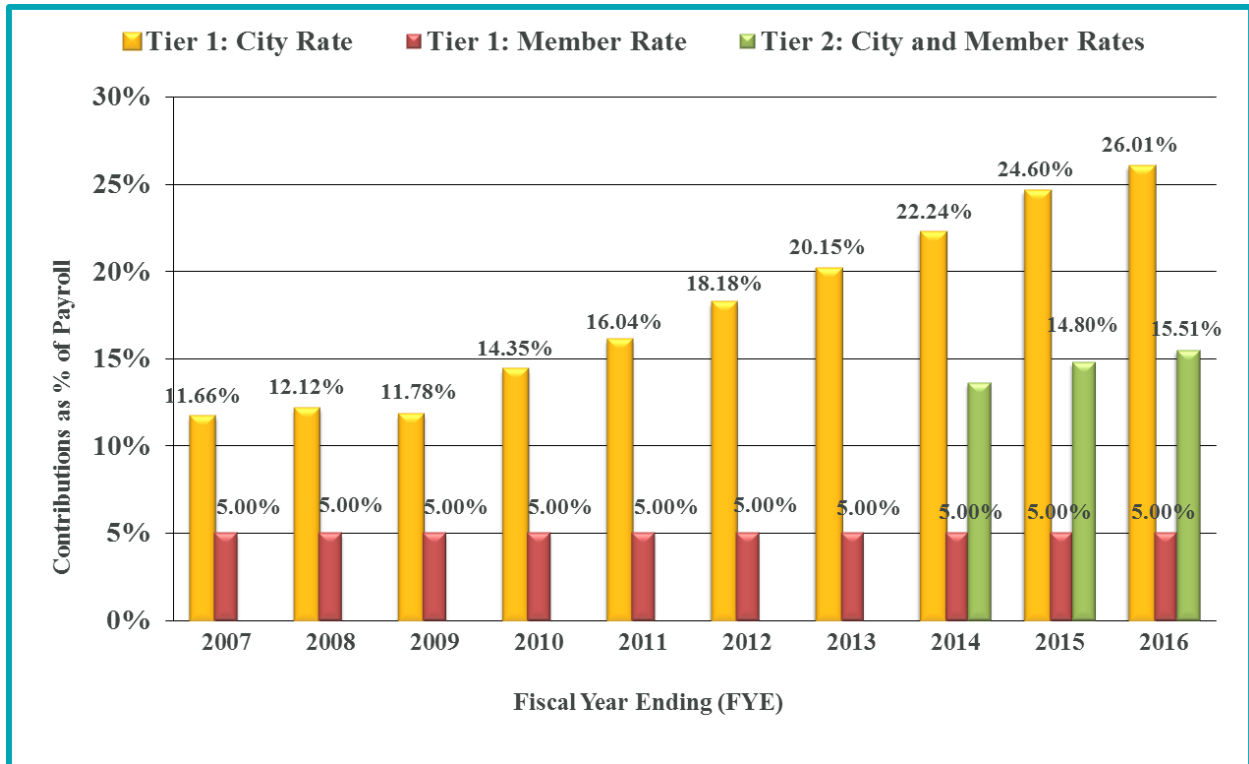
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Funded Ratio	84.2%	81.3%	83.9%	79.1%	75.3%	69.3%	66.6%	62.2%	56.4%	58.7%
UAL/(Surplus) <i>(in millions)</i>	\$ 284.0	\$ 373.6	\$ 349.6	\$ 505.0	\$ 622.9	\$ 829.2	\$ 918.3	\$ 1,111.8	\$ 1,516.9	\$ 1,494.1

The chart below shows the historical trends for the contribution rates for COPERS since the FYE June 30, 2007.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

**Chart I-3: City and Member Contribution Rates for FYE 2007–FYE 2016**



Reflecting the declining funded ratio since 2008, the City’s contribution rates have steadily increased from the FYE 2010 through the FYE 2016.

**Projections**

This section shows projections of accumulating assets and liabilities along with the resulting funded ratios and contribution rates based on the June 30, 2014 valuation. The first set of charts shows a deterministic projection assuming all assumptions are realized. The second set of charts shows a stochastic projection of 5,000 trials based on an assumed distribution of investment returns with a geometric mean of 7.50% and a standard deviation of 10.5%.

SECTION I  
 BOARD SUMMARY

**Projected Assets and Liabilities**

Chart I-4 below shows the projected actuarial liability (gray bars) as well as the smoothed actuarial value of assets (blue line) and the market value of assets (green line). The projected funded ratio, on an actuarial value of assets basis, is shown at the top of each gray bar. If all assumptions are met each and every year, the funded ratio is expected to steadily increase from 59% to 90% over the 20-year period.

**Chart I-4: Projection of Assets and Liabilities, 7.50% return each year**

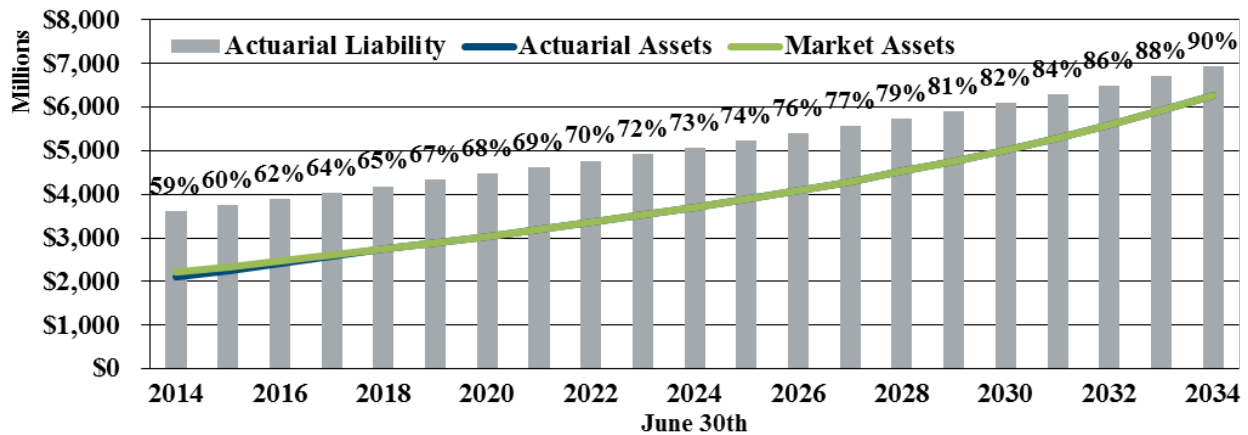
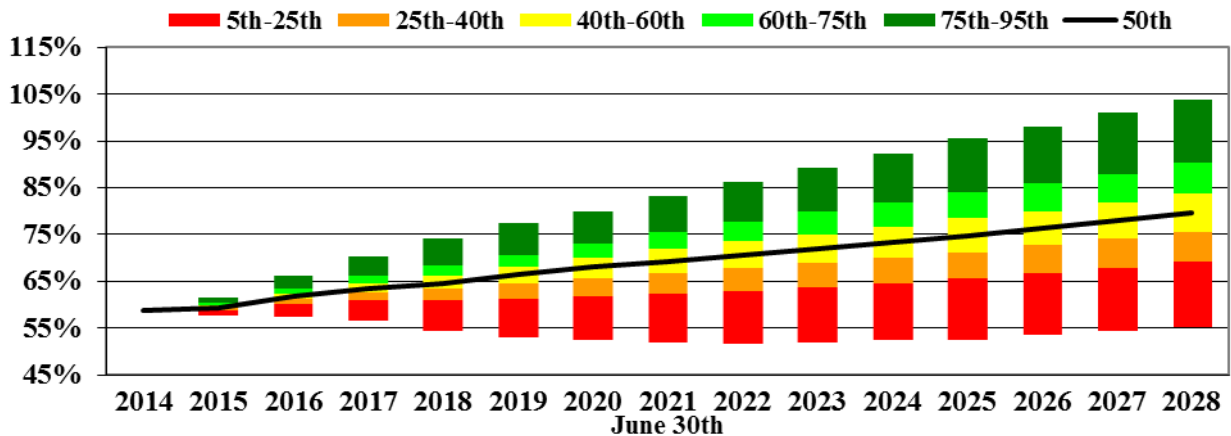


Chart I-5 shows a 15-year stochastic projection of funding ratios. The black line shows the median funded ratio projected for each year. The colored ranges represent different percentiles of the 5,000 results. For example, the red range represents the 5<sup>th</sup> through 25<sup>th</sup> percentile funded ratio for each year. Based on the assumed distribution of investment returns, there is a 5% chance the result will be worse than the red range and a 75% chance the result will be better. The range of potential funded ratios is pretty wide.

**Chart I-5: Stochastic Projection of Funded Ratio**



SECTION I  
 BOARD SUMMARY

**Projected Contribution Rates**

Chart I-6 below shows projected member contribution rates (purple bars) and City contribution rates (gold bars). If all assumptions are met, City contribution rates are expected to increase from approximately 23.9% in the FYE 2015 to approximately 25.4% in FYE 2018 as the impact of the assumption changes is phased in. Then, City contribution rates are expected to decline steadily to 18.4% by FYE 2035. Member contribution rates are projected to increase steadily over the entire period as Tier 1 members who contribute 5% leave the workforce and are replaced by Tier 2 members who contribute 50% of the total contribution rate. The projected total contribution rate is lower than that projected in the prior valuation, primarily due to investment returns.

**Chart I-6: Projected Contribution Rates, 7.50% return each year**

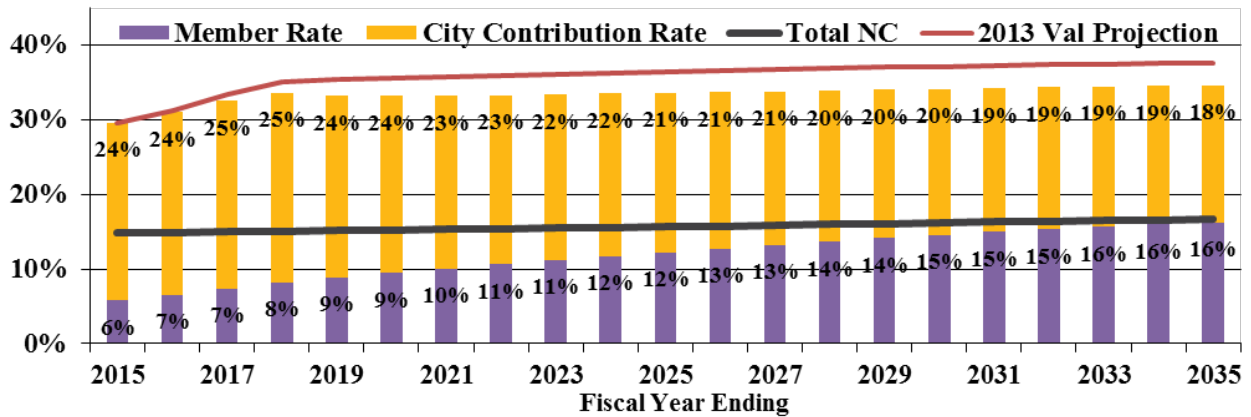


Chart I-7 shows a 15-year stochastic projection of City contribution rates. The black line shows the median funded ratio projected for each year. The colored ranges represent different percentiles of the 5,000 results. While the City's contribution rate is expected to decrease over time, there is significant uncertainty depending on investment returns. As noted above, the downward trend relies on a growing Tier 2 population contributing half of the total contribution rate.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

**Chart I-7: Stochastic Projection of City Contribution Rates**

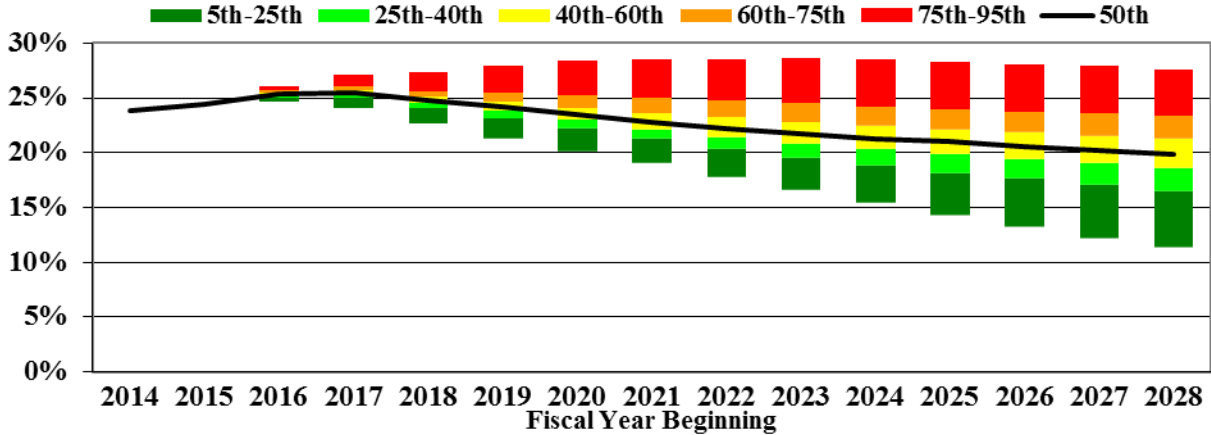
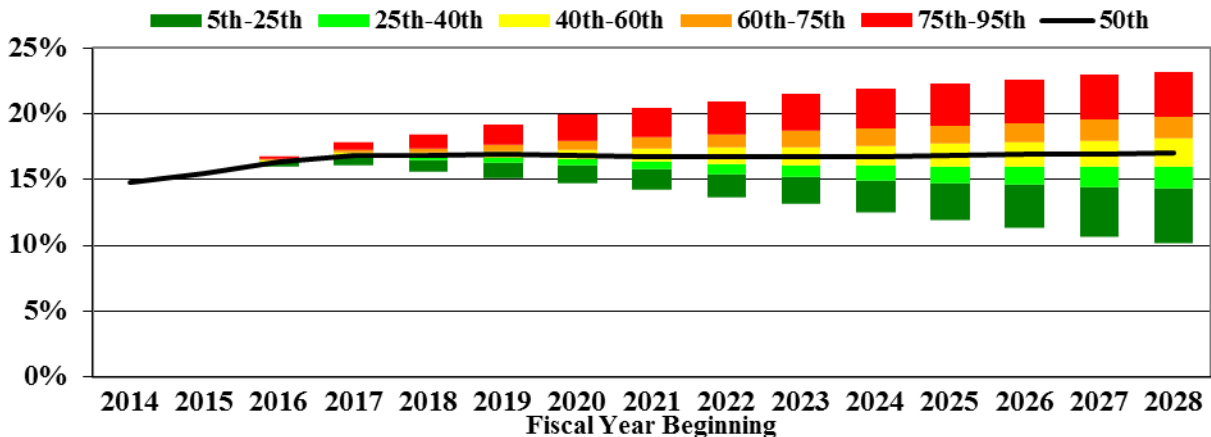


Chart I-8 shows a 15-year stochastic projection of Tier 2 employee contribution rates. The black line shows the median contribution rate projected for each year. The colored ranges represent different percentiles of the 5,000 results. As noted above, the projected decrease in City contribution rates depends on a growing Tier 2 employee population contributing half of the total contribution rate. The Tier 2 employee contribution rate is sensitive to investment earnings and could potentially rise to levels significantly in excess of the Tier 2 normal cost rate of approximately 17% of pay. In such a case, Tier 2 members would be contributing more than the expected cost of their benefits.

**Chart I-8: Stochastic Projection of Tier 2 Employee Contribution Rates**



**Projected Contribution Amounts**

Chart I-9 below shows projected member (purple bars) and City (gold bars) contribution amounts. If all assumptions are met, City contributions are expected to increase from approximately \$121 million in FYE 2015 to approximately \$143 million in FYE 2018 as the

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION I  
BOARD SUMMARY**

impact of the assumption changes is phased in. The contribution amount is expected to remain level for about three years before increasing again at a rate lower than payroll growth. Member contributions are expected to increase more rapidly as Tier 1 members are replaced with Tier 2 members.

**Chart I-9: Projected Contribution Amounts, 7.50% return each year**

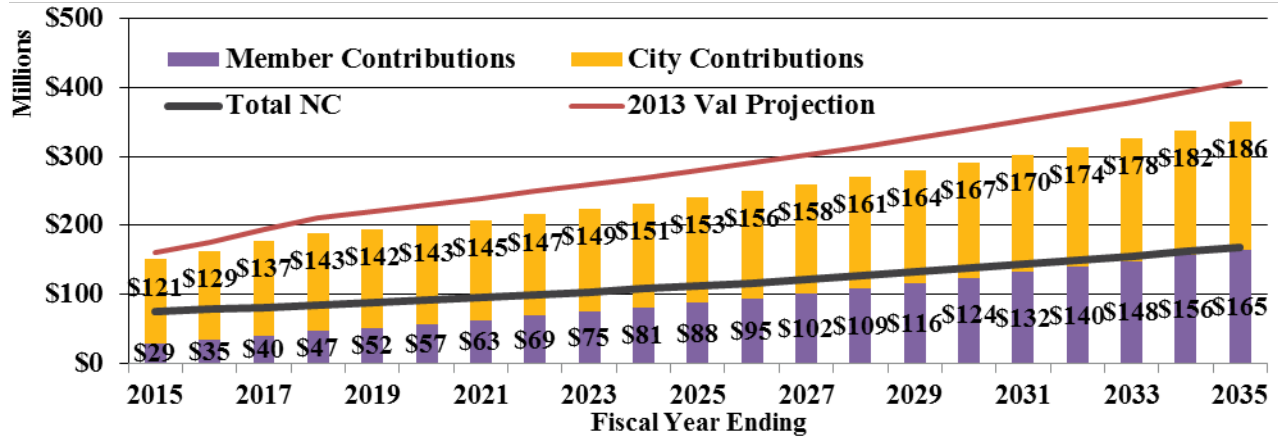
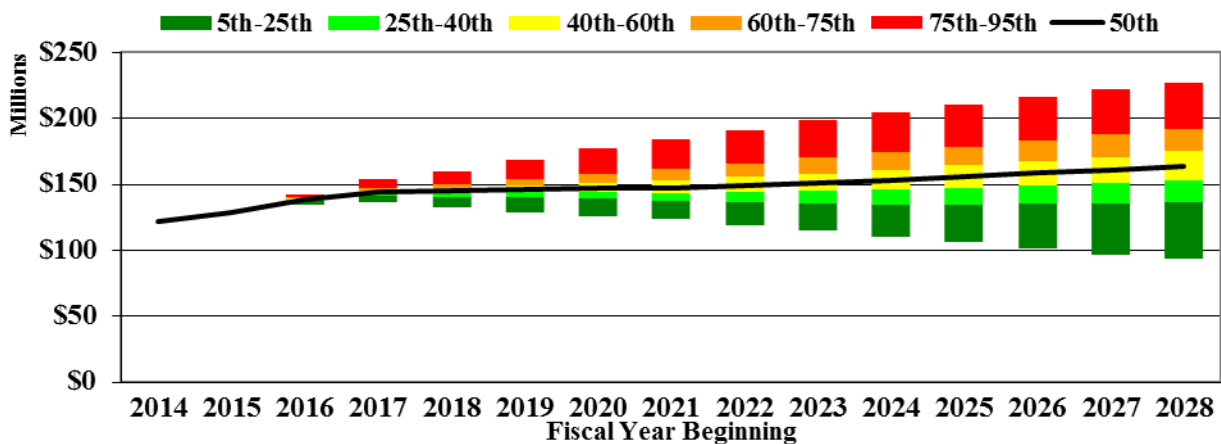


Chart I-10 below shows a 15-year stochastic projection of City contribution amounts. The black line shows the median contribution rate projected for each year. The colored ranges represent different percentiles of the 5,000 results. There is significant uncertainty in the level of City contributions depending on investment returns.

**Chart I-10: Stochastic Projection of City Contribution Amounts**



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION II  
CERTIFICATION**

The purpose of this report is to provide the results of the June 30, 2014 actuarial valuation for the City of Phoenix Employees' Retirement System (COPERS). This report is for the use of the System and the City of Phoenix and their auditors in preparing financial reports in accordance with applicable law and accounting requirements.

In preparing our report, we relied on information, some oral and some written, supplied by the System. 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 No. 23.

The demographic assumptions used in this 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. The economic assumptions were adopted by the Board in September 2013. We will review all of these assumptions as part of the next experience study before the next valuation.

The funded ratios in this report are for the purpose of establishing contribution rates and meeting financial reporting requirements under GASB 67 and 68. These measures are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Future actuarial measurements may differ significantly from the current measurements due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and, changes in plan provisions or applicable law.

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 that are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. The schedules provided for financial reporting purposes have been prepared in accordance with our understanding of generally accepted accounting principles as promulgated by the GASB. 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.

This report was prepared for the System 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.

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

Elizabeth Wiley, FSA, FCA, EA, MAAA  
Consulting Actuary



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION III  
ASSETS**

COPERS uses and discloses two different asset measurements that are presented in this section of the report: market value and actuarial value. The market value represents, as of the valuation date, the value of the assets if they were liquidated on that date. The actuarial value of assets is a value that smoothes annual investment returns over four years to reduce the impact of short-term investment volatility on contribution rates. The market value of assets is used primarily for reporting and disclosure, and the actuarial value of assets is used primarily to determine contribution rates.

This section shows the changes in the market value of assets and develops the actuarial value of assets.

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

Table III-1 shows the changes in the market value of assets for the current and prior fiscal years.

<b>Table III - 1</b>		
<b>Changes In Market Value Of Assets</b>		
	<b>FYE 2014</b>	<b>FYE 2013</b>
Market Value, Beginning of Year	\$ 1,965,621,678	\$ 1,795,690,300
Contributions		
Member	\$ 27,760,382	\$ 28,792,813
City	110,629,381	114,709,207
Inter-System Transfers	160,061	105,347
Total	<u>\$ 138,549,824</u>	<u>\$ 143,607,367</u>
Net Investment Earnings	\$ 298,575,764	\$ 194,915,860
Disbursements		
Benefit Payments	\$ (179,639,188)	\$ (167,985,974)
Inter-System Transfers	(238,119)	(605,875)
Administrative Expenses <sup>1</sup>	(628,437)	0
Total	<u>\$ (180,505,744)</u>	<u>\$ (168,591,849)</u>
Market Value, End of Year	\$ 2,222,241,522	\$ 1,965,621,678
Net Cash Flow as % of Assets	-2.1%	-1.4%
Estimated Rate of Return	15.4%	10.9%

<sup>1</sup> Administrative expenses prior to FYE 2014 were netted from investment earnings.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION III  
ASSETS**

The net investment earnings for the year ended June 30, 2014 represent approximately a 15.4% return on the market value of assets compared to an assumed return of 7.5%. For the year ended June 30, 2013, the net investment return was approximately 10.9%.

**Actuarial Value of Assets**

To determine ongoing contribution amounts, COPERS uses 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 difference between actual investment returns and the expected return (7.50%) on the prior year's actuarial value of assets over a four-year period. Any difference between the expected return and the actual net investment earnings is considered a gain or loss. Table III-2 below shows the calculation of the actuarial value of assets, including increases for actual contributions and expected earnings, reductions for actual benefit payments and administrative expenses, and recognition of 25 percent of the gains and losses for the last four years. The gain and loss amounts not recognized in the current year will be recognized in future years.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION III  
ASSETS**

<b>Table III - 2</b>		
<b>Development Of Actuarial Value Of Assets</b>		
	<b>FYE 2014</b>	<b>FYE 2013</b>
1. Actuarial Value of Assets, Beginning of Year	\$ 1,962,532,556	\$ 1,828,104,723
2. Net Cash Flow	(41,955,920)	(24,984,482)
3. Expected Return	145,645,038	145,268,225
4. Actual Return	298,575,764	194,915,860
5. Current Year Gain / (Loss) [ 4. - 3. ]	152,930,726	49,647,635
6. Gains / (Losses)		
a. Current Year	\$ 152,930,726	\$ 49,647,635
b. Prior Year	49,647,635	(151,922,641)
c. 2nd Prior Year	(151,922,641)	167,258,865
d. 3rd Prior Year	167,258,865	(8,407,500)
e. Total	\$ 217,914,585	\$ 56,576,359
7. Phase-In Amount [25% of 6.e.]	\$ 54,478,646	\$ 14,144,090
8. Actuarial Value of Assets, End of Year [1. + 2. + 3. + 7.]	\$ 2,120,700,320	\$ 1,962,532,556
9. Estimated Rate of Return	10.3%	8.8%
10. Ratio of Actuarial to Market Value of Assets	95.4%	99.8%

On the basis of the smoothed actuarial value of assets, the return for the year ending June 30, 2014 was approximately 10.3%, more than the assumed return of 7.5%, but less than the return on the market value of assets.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION IV  
MEASURES OF LIABILITY FOR FUNDING**

This section presents detailed information on liability measures for COPERS for funding purposes, 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 IV-1 below shows the present value of future benefits as of June 30, 2014 and June 30, 2013.

The amounts as of June 30, 2014 are split between Tier 1 and Tier 2.

<b>Table IV - 1</b>				
<b>Present Value Of Future Benefits</b>				
	<b>June 30, 2014</b>			<b>June 30, 2013 <sup>1</sup></b>
	<b>Tier 1</b>	<b>Tier 2</b>	<b>Total</b>	<b>Total</b>
<b>Actives</b>				
Retirement	\$1,712,587,476	\$ 12,018,986	\$1,724,606,462	\$1,822,363,855
Termination	116,166,339	6,211,812	122,378,151	120,179,728
Death	44,388,485	752,139	45,140,624	46,723,104
Disability	81,017,259	1,187,272	82,204,531	85,280,518
<b>Total Actives</b>	<b>\$1,954,159,559</b>	<b>\$ 20,170,209</b>	<b>\$1,974,329,768</b>	<b>\$2,074,547,205</b>
<b>In Pay Status</b>				
Service Retirees	\$1,903,734,649	\$ 0	\$1,903,734,649	\$1,694,533,205
Disabled Retirees	44,453,602	0	44,453,602	43,974,804
Beneficiaries	151,086,046	0	151,086,046	142,614,982
<b>Total</b>	<b>\$2,099,274,297</b>	<b>\$ 0</b>	<b>\$2,099,274,297</b>	<b>\$1,881,122,991</b>
Deferred Vested	\$ 56,461,476	\$ 0	\$ 56,461,476	\$ 52,209,125
<b>Total</b>	<b>\$4,109,895,332</b>	<b>\$ 20,170,209</b>	<b>\$4,130,065,541</b>	<b>\$4,007,879,321</b>

<sup>1</sup> Based on September 2013 Assumptions presented in the June 30, 2013 report.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION IV  
MEASURES OF LIABILITY FOR FUNDING**

**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 dividing the value, as of entry age into the System, of each member's projected future benefits by the value, also at entry age, of the member's expected future salary. The normal cost rate is multiplied by the member's 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 IV-2 below shows the EA normal cost as of June 30, 2014 and June 30, 2013 for Tier 1 members.

<b>Table IV - 2</b>				
<b>Tier 1 Entry Age Normal Cost</b>				
	<b>June 30, 2014</b>		<b>June 30, 2013 <sup>1</sup></b>	
<b>Tier 1 Normal Cost</b>				
Retirement	\$	49,382,902	\$	53,118,753
Termination		10,884,655		11,314,184
Death		2,204,626		2,355,284
Disability		3,792,802		4,063,880
<b>Total Tier 1 Normal Cost</b>	<b>\$</b>	<b>66,264,985</b>	<b>\$</b>	<b>70,852,101</b>
Expected Tier 1 active payroll	\$	453,632,159	\$	482,473,389
<b>Tier 1 Normal Cost Rate</b>		<b>14.61%</b>		<b>14.69%</b>

<sup>1</sup> Based on September 2013 Assumptions presented in the June 30, 2013 report.

Table IV-3 below shows the EA normal cost as of June 30, 2014 and June 30, 2013 for Tier 2 members. The normal cost rate as of June 30, 2013 was based on a hypothetical set of employees with demographic characteristics identical to employees hired within the previous five years. The normal cost rate as of June 30, 2014 reflects actual Tier 2 members. The difference in normal cost rates is primarily attributable to the different demographic characteristics of actual Tier 2 members compared to those expected to be hired in Tier 2. However, there are still relatively few Tier 2 members, so the demographic characteristics may continue to change over the next few years, causing some fluctuation in the normal cost rate.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION IV  
MEASURES OF LIABILITY FOR FUNDING**

<b>Table IV - 3</b>			
<b>Tier 2 Entry Age Normal Cost</b>			
		<b>June 30, 2014</b>	<b>June 30, 2013</b>
<b>Tier 2 Normal Cost</b>			
Retirement	\$	1,407,636	N/A
Termination		672,335	N/A
Death		90,475	N/A
Disability		138,185	N/A
Total Tier 2 Normal Cost	\$	2,308,631	N/A
Expected Tier 2 active payroll	\$	13,607,103	N/A
Tier 2 Normal Cost Rate		16.97%	18.84%

**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 actuarial value of assets is the unfunded actuarial liability. Table IV-4 below shows the actuarial liability as of June 30, 2014 and June 30, 2013.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION IV  
MEASURES OF LIABILITY FOR FUNDING**

<b>Table IV - 4</b>				
<b>Actuarial Liability</b>				
	<b>June 30, 2014</b>			<b>June 30, 2013 <sup>1</sup></b>
	<b>Tier 1</b>	<b>Tier 2</b>	<b>Total</b>	<b>Total</b>
<b>Actives</b>				
Retirement	\$1,345,493,102	\$ 772,237	\$1,346,265,339	\$1,429,274,675
Termination	30,701,241	298,522	30,999,763	31,594,870
Death	28,270,535	40,222	28,310,757	29,514,994
Disability	53,407,903	64,694	53,472,597	55,730,594
<b>Total Actives</b>	<b>\$1,457,872,781</b>	<b>\$ 1,175,675</b>	<b>\$1,459,048,456</b>	<b>\$1,546,115,133</b>
<b>In Pay Status</b>				
Service Retirees	\$1,903,734,649	\$ 0	\$1,903,734,649	\$1,694,533,205
Disabled Retirees	44,453,602	0	44,453,602	43,974,804
Beneficiaries	151,086,046	0	151,086,046	142,614,982
<b>Total</b>	<b>\$2,099,274,297</b>	<b>\$ 0</b>	<b>\$2,099,274,297</b>	<b>\$1,881,122,991</b>
Deferred Vested	\$ 56,461,476	\$ 0	\$ 56,461,476	\$ 52,209,125
<b>Total Actuarial Liability</b>	<b>\$3,613,608,554</b>	<b>\$ 1,175,675</b>	<b>\$3,614,784,229</b>	<b>\$3,479,447,249</b>

<sup>1</sup> Based on September 2013 Assumptions presented in the June 30, 2013 report.

### **Unfunded Actuarial Liability (UAL) and Funded Ratios**

The UAL is the difference between the actuarial liability and an assets measure. This difference represents how far ahead or behind the funding target assets are as of the valuation date. If all assumptions are met in the future, additional contributions will be needed to pay off the UAL. For determining contribution amounts, the UAL is measured using the actuarial value of assets (AVA), which dampens the impact of short-term volatility in investment returns on contribution rates. However, it is important to also understand the UAL measured using the market value of assets (MVA) as this is the amount that must ultimately be made up either through future contributions or future experience.

The funded ratio is simply the ratio of assets to actuarial liability. It is measured using both the AVA and the MVA. As the funded ratio compares assets to the funding target, it is appropriate for assessing the need for and amount of future contributions in excess of the normal cost. It is not appropriate for other purposes such as assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Table IV-5 shows the calculation of the UAL and funded ratio based both on the actuarial and market value of assets as of June 30, 2014 and June 30, 2013.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION IV  
MEASURES OF LIABILITY FOR FUNDING**

<b>Table IV - 5</b>				
<b>Unfunded Actuarial Liability (UAL)</b>				
	<b>June 30, 2014</b>		<b>June 30, 2013</b>	
Actuarial Liability	\$	3,614,784,229	\$	3,479,447,249
Actuarial Value of Assets (AVA)		2,120,700,320		1,962,532,556
AVA UAL	\$	1,494,083,909	\$	1,516,914,693
AVA Funded Ratio		58.7%		56.4%
Market Value of Assets (MVA)		2,222,241,522		1,965,621,678
MVA UAL	\$	1,392,542,707	\$	1,513,825,571
MVA Funded Ratio		61.5%		56.5%

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

The UAL is expected to change at each valuation for a variety of reasons. Table IV-6 below develops the expected UAL measured on the actuarial value of assets and identifies the primary sources for changes in the UAL since the last valuation.



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION IV  
MEASURES OF LIABILITY FOR FUNDING**

<b>Table IV - 6</b>	
<b>Development Of Experience (Gain) / Loss</b>	
<b>Item</b>	<b>Amount</b>
1. Unfunded Actuarial Liability at June 30, 2013	\$ 1,516,914,693
2. Normal Cost for Year	78,330,722
3. Expected City and Member Contributions	153,884,915
4. Interest	110,986,540
5. Expected Unfunded Actuarial Liability at June 30, 2014 [1. + 2. - 3. + 4.]	\$ 1,552,347,041
6. Actual Unfunded Actuarial Liability at June 30, 2014	\$ 1,494,083,909
7. (Gain) or Loss [7. - 6.]	\$ (58,263,132)
Difference portion due to:	
Asset Experience	\$ (37,927,308)
Salary Gain	(49,036,907)
Retirement Loss	22,182,223
Termination Loss	11,613,222
COLA Gain	(8,942,609)
Other Loss	3,848,247
Total	\$ (58,263,132)

**SECTION V  
CONTRIBUTIONS**

Under the funding method employed by COPERS, there are two components to the contribution: the normal cost and an amortization payment on the unfunded actuarial liability. The normal cost rates for Tiers 1 and 2 were developed in Section IV. This section develops the UAL amortization payment rate and the total contribution rate. Then, the total contribution rate is split between Tier 1 members, Tier 2 members, and the City and finally, the total City contribution is estimated.

The UAL is composed of experience gains and losses, assumption changes and plan provision changes. In September 2013, the Board adopted amortization methods that:

1. Amortize the UAL measured before the assumption changes as of July 1, 2013 over a closed 25-year period as a level percentage of payroll,
2. Amortize the change in UAL due to the assumption changes as of July 1, 2013 over a closed 25-year period as a level percentage of payroll with a four-year phase-in to the ultimate rate, and
3. Amortize future gains and losses over closed 20-year periods from the date in which they are first recognized as a level percent of payroll (except future gains cannot be amortized over a period shorter than the period remaining on the 25-year amortizations described above).

Table V-1 shows the amortization payment for each of the three current components of the total UAL rate. The amortization payment for the 2013 assumption changes this year represents one-half of the regularly calculated amortization payment due to the four-year phase-in to the ultimate rate. In the third year, the outstanding balance is re-amortized over the remaining 23 years and the third year payment is three-quarters of the regularly calculated amortization payment. In the fourth and later years, the regularly calculated amortization payment is made.

Since the experience for 2014 was an actuarial gain, it is amortized over 24 years, the remaining period on the 2013 UAL amortization.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION V  
CONTRIBUTIONS**

<b>Table V - 1</b>				
<b>Development Of UAL Contribution Rate</b>				
<b>Amortization Base</b>	<b>Outstanding Balance</b>	<b>Remaining Period</b>	<b>Amortization Payment</b>	<b>Amortization % of Pay</b>
2013 UAL	\$ 1,104,266,957	24	\$ 71,300,324	14.00%
2013 Assumption Changes <sup>1</sup>	448,080,084	24	14,465,821	2.84%
2014 Experience Gain	<u>(58,263,132)</u>	24	<u>(3,761,935)</u>	<u>-0.74%</u>
Total	\$ 1,494,083,909		\$ 82,004,210	16.10%

<sup>1</sup> The amortization of the 2013 assumption changes is phased in over four years. The first year payment is one-fourth of the regularly calculated amortization payment, increasing each year until the regularly calculated amortization payment is made after four years.

The total contribution rate consists of the normal cost rate plus the UAL rate. For Tier 1, members contribute 5 percent of pay and the City contributes the balance. For Tier 2, the members and City each contribute half of the total rate. These contribution rates are applied to the actual payroll for each Tier for the applicable fiscal year. Table V-2 below summarizes the contribution rates and estimated contribution amounts for the fiscal years ending June 30, 2016 and June 30, 2015.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION V  
CONTRIBUTIONS**

<b>Table V - 2</b>		
<b>Summary Of Contribution Rates And Estimated Amounts</b>		
<b>Fiscal Year Ending</b>	<b>June 30, 2016</b>	<b>June 30, 2015</b>
Total Normal Cost Rate	14.84%	15.24%
Administrative Expenses	0.07%	0.00%
Total UAL Contribution Rate	<u>16.10%</u>	<u>14.36%</u>
Total Contribution Rate	31.01%	29.60%
<b>Member Contribution Rates</b>		
Tier 1	5.00%	5.00%
Tier 2	15.51%	14.80%
<b>City Contribution Rates</b>		
Tier 1	26.01%	24.60%
Tier 2	15.51%	14.80%
<b>Projected Payroll</b>		
Tier 1	\$ 449,317,515	\$ 471,927,971
Tier 2	<u>77,774,102</u>	<u>72,442,418</u>
Total	\$ 527,091,617	\$ 544,370,388
<b>Estimated Contribution Amounts</b>		
Members	\$ 34,528,639	\$ 34,317,876
City	<u>128,922,471</u>	<u>126,815,759</u>
Total	\$ 163,451,110	\$ 161,133,635

**SECTION VI**  
**ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

This section provides accounting and financial disclosure information under Governmental Accounting Standards Board (GASB) Statement No. 67 for COPERS as well as GASB 68 information for the City of Phoenix. This information includes:

- Determination of the single rate of return used as the discount rate for measuring the Total Pension Liability (TPL)
- Changes in the TPL, FNP, and NPL
- Calculation of the Net Pension Liability (NPL) at that discount rate as well as discount rates 1% higher and lower
- Schedule of changes in NPL and related ratios
- Schedule of employer contributions
- Deferred inflows and outflows
- Calculation of pension expense

This report is the first report developed for COPERS under GASB 67. The reporting date for COPERS is June 30, 2014. Measurements as of the reporting date are based on the fair value of assets as of June 30, 2014 and the Total Pension Liability developed as of the valuation date July 1, 2014.

The beginning of year measurements for FYE 2014 are based on the actuarial valuation as of June 30, 2013, reflecting the assumption changes adopted by the Board in September 2013. The end of year measurements for FYE 2014 are based on the actuarial valuation as of June 30, 2014. There were no significant events during the projection period of which we are aware.

### **Determination of Discount Rate**

The discount rate used to measure the Total Pension Liability as of both June 30, 2013 and June 30, 2014 was 7.50%, equal to the assumed long-term expected rate of return on the System's investments.

We have assumed that employee and employer contributions to the System will continue to follow the established contribution policy. The total contribution rate is the sum of the normal cost rate and the unfunded actuarial liability (UAL) rate. The normal cost rate is determined under the entry age actuarial cost method. The UAL rate is the sum of the amortization rates for each amortization base. As of June 30, 2014, there are three amortization bases. The entire UAL before reflecting assumption changes as of June 30, 2013 is being amortized as a level percent of payroll over a closed 25-year period. The assumption changes adopted by the Board in September 2013 are being amortized as a level percent of payroll over a closed 25-year period with a four-year phase-in to the full amortization payment. Future changes to the UAL are amortized over closed 20-year periods except that gains cannot be amortized over a period shorter than the remaining period on the 2013 UAL. Since there was a gain for the year ended June 30, 2014, it is being amortized over 24 years as the third current amortization base. The UAL is based on an actuarial value of assets that recognizes differences between actual and expected investment returns on the actuarial value of assets over a four-year period.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VI  
ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

We have not performed a formal cash flow projection as described under Paragraph 41 of GASB Statement 67. However, Paragraph 43 allows for alternative methods to confirm the sufficiency of the Net Position if the evaluations “can be made with sufficient reliability without a separate projection of cash flows into and out of the pension plan...” In our professional judgment, adherence to the contribution policy described above will result in the pension plan’s projected fiduciary net position being greater than or equal to the benefit payments projected for each future period.

Therefore, the long-term expected rate of return on System investments was applied to all periods of projected benefit payments to determine the Total Pension Liability. Additionally, the actuarial methods and assumptions used in developing the TPL, including the use of the entry age actuarial cost method as described in paragraph 46 of GASB 67, are the same as those used in developing the actuarial liability for funding purposes. As a result, the TPL is identical to the actuarial liability calculated for funding purposes and shown in Section IV of this report.

**Note Disclosures**

The table below shows the changes in the Total Pension Liability, the Plan Fiduciary Net Position (i.e., fair value of System assets), and the Net Pension Liability during the Measurement Year.

<b>Table VI - 1 Change in Net Pension Liability</b>			
	<b>Increase (Decrease)</b>		
	<b>Total Pension Liability (TPL)</b>	<b>Plan Fiduciary Net Position (FNP)</b>	<b>Net Pension Liability (NPL)</b>
	<b>(a)</b>	<b>(b)</b>	<b>(a) - (b)</b>
<b>Balances at 6/30/2013</b>	\$ 3,479,447	\$ 1,965,622	\$ 1,513,826
<b>Changes for the Year:</b>			
Service Cost	78,331		78,331
Interest	257,219		257,219
Changes of Benefits	0		0
Changes of Assumptions	0		0
Differences between Expected and Actual Experience	(20,336)		(20,336)
Contributions - Employer		110,629	(110,629)
Contributions - Member		27,760	(27,760)
Net Investment Income		298,736	(298,736)
Benefit Payments	(179,877)	(179,877)	0
Administrative Expense		(628)	628
<b>Net Changes</b>	<u>135,337</u>	<u>256,620</u>	<u>(121,283)</u>
<b>Balances at 6/30/2014</b>	<u>\$ 3,614,784</u>	<u>\$ 2,222,242</u>	<u>\$ 1,392,543</u>

*Amounts in Thousands*

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VI  
ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

There were no changes in benefits or changes in assumptions during the year. The difference between expected and actual experience was a gain of approximately \$20.3 million. The sources of this gain are shown in Table IV-6 (excluding asset experience).

Total contributions and investment income exceeded the service cost, interest cost, and administrative expenses, resulting in a decrease in the Net Pension Liability (NPL) of approximately \$121 million. The NPL remaining as of June 30, 2014, is approximately \$1.4 billion.

Changes in the discount rate affect the measurement of the TPL. Lower discount rates produce a higher TPL and higher discount rates produce a lower TPL. Because the discount rate does not affect the measurement of assets, the percentage change in the NPL can be very significant for a relatively small change in the discount rate. The table below shows the sensitivity of the NPL to the discount rate.

<b>Table VI - 2 Sensitivity of Net Pension Liability to Changes in Discount Rate</b>			
	<b>1% Decrease 6.50%</b>	<b>Discount Rate 7.50%</b>	<b>1% Increase 8.50%</b>
Total Pension Liability	\$ 4,043,923	\$ 3,614,784	\$ 3,252,342
Plan Fiduciary Net Position	<u>2,222,242</u>	<u>2,222,242</u>	<u>2,222,242</u>
Net Pension Liability	<u>\$ 1,821,681</u>	<u>\$ 1,392,543</u>	<u>\$ 1,030,101</u>
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	55.0%	61.5%	68.3%

*Amounts in Thousands*

A one percent decrease in the discount rate increases the TPL by approximately 12% and increases the NPL by approximately 31%. A one percent increase in the discount rate decreases the TPL by approximately 10% and decreases the NPL by approximately 26%.

**Required Supplementary Information**

The schedules of Required Supplementary Information generally start with one year of information as of the implementation of GASB 67, but eventually will need to build up to 10 years of information. The schedule below shows the changes in NPL and related ratios required by GASB.

CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION

**SECTION VI**  
**ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

<b>Table VI - 3</b>	
<b>Schedule of Changes in Net Pension Liability and Related Ratios</b>	
	<b>FYE 2014</b>
<b><u>Total Pension Liability</u></b>	
Service Cost (MOY)	\$ 78,331
Interest (includes Interest on Service Cost)	257,219
Changes of Benefit Terms	0
Differences between Expected and Actual Experience	(20,336)
Changes of Assumptions	0
Benefit Payments, including Refunds of Member Contributions	(179,877)
<b>Net Change in Total Pension Liability</b>	<b>135,337</b>
<b>Total Pension Liability - Beginning</b>	<b>3,479,447</b>
<b>Total Pension Liability - Ending</b>	<b>\$ 3,614,784</b>
<b><u>Plan Fiduciary Net Position</u></b>	
Contributions - Employer	\$ 110,629
Contributions - Member	27,760
Net Investment Income	298,736
Benefit Payments, including Refunds of Member Contributions	(179,877)
Administrative Expense	(628)
<b>Net Change in Plan Fiduciary Net Position</b>	<b>\$ 256,620</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>1,965,622</b>
<b>Plan Fiduciary Net Position - Ending</b>	<b>\$ 2,222,242</b>
<b>Net Pension Liability - Ending</b>	<b>\$ 1,392,543</b>
<b>Plan Fiduciary Net Position as a Percentage of the Total Pension Liability</b>	<b>61.48%</b>
<b>Covered Employee Payroll</b>	<b>\$ 509,267</b>
<b>Net Pension Liability as a Percentage of Covered Employee Payroll</b>	<b>273.44%</b>

*Amounts in Thousands*

Since an Actuarially Determined Contribution (ADC) is calculated, a 10-year schedule is required showing the following:

1. The Actuarially Determined Contribution (formerly referred to as the ARC),
2. Actual contributions related to the ADC,
3. The difference between the ADC and actual contributions related to the ADC,
4. The covered employee payroll, and
5. The actual contributions as a percentage of covered employee payroll.



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VI  
ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

Because prior contribution amounts were determined in accordance with Actuarial Standards of Practice, we believe the full 10-year schedule should be shown. However, we do not have the necessary information to prepare the schedule. The following information on key methods and assumptions used to calculate the ADC for FYE 2014 should be presented as notes to the schedule:

<b>Notes to Schedule</b>	
Valuation date:	June 30, 2012
Timing	Actuarially determined contribution rates are calculated based on the actuarial valuation one year prior to the beginning of the plan year
Actuarial cost method	Entry age
Asset valuation method	4-year smoothed market
Amortization method	The entire UAL is amortized as a level percentage of payroll over an open 20-year period.
Discount rate	8.00%
Salary increases	5.00% plus merit component based on age ranging from 3.80% at age 20 to 0.00% for members age 65 and older
Amortization payment growth rate	5.00%
COLA	None
Mortality	Male and female RP-2000 combined employee and annuitant tables.
A complete description of the methods and assumptions used to determine contribution rates for the fiscal year ending June 30, 2014 can be found in the June 30, 2012 actuarial valuation report.	

### **Employer Reporting Amounts**

The City of Phoenix is not required to implement GASB 68 until their reporting date of June 30, 2015. However, the amounts reported as of June 30, 2015 by the City can be based on either the June 30, 2014 or 2015 measurement dates. The schedules in this section are provided in the event the City either elects to implement GASB 68 early or elects to use the 2014 measurement date for its 2015 reporting.

The impact of experience gains or losses and assumption changes on the TPL are recognized in expense over the average expected remaining service life of all active and inactive members of the System. As of the measurement date, this recognition period was 5 years. During the measurement year, there was an experience gain of approximately \$20.3 million. Approximately

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VI  
ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

\$4.1 million of that gain is recognized in the current year and an identical amount will be recognized in each of the next four years, resulting in a deferred inflow of resources of approximately \$16.2 million.

The impact of investment gains or losses is recognized over a period of five years. During the measurement year, there was an investment gain of approximately \$153 million. Approximately \$30.6 million of that gain is recognized in the current year and an identical amount will be recognized in each of the next four years, resulting in a deferred inflow of resources of approximately \$122 million.

The total deferred inflows of resources of approximately \$139 million represents the gains experienced this year that will be recognized as a reduction in pension expense in the next four years. The table below summarizes the current balances of deferred outflows and deferred inflows of resources along with the net recognition over the next five years.

<b>Table VI - 4</b>		
	<b>Deferred Outflows of Resources</b>	<b>Deferred Inflows of Resources</b>
Differences between Expected and Actual Experience	\$ 0	\$ 16,268,662
Changes in Assumptions	0	0
Net Difference between Projected and Actual Earnings on Pension Plan Investments	0	122,291,998
<b>Total</b>	<b>\$ 0</b>	<b>\$ 138,560,660</b>

Amounts reported as deferred outflows and deferred inflows of resources will be recognized in pension expense as follows:

<b>Year ended June 30:</b>	
2015	(34,640,164)
2016	(34,640,164)
2017	(34,640,164)
2018	(34,640,168)
2019	0
Thereafter \$	0

*Amounts in Thousands*

The annual pension expense recognized by the City can be calculated two different ways. First, it is the change in the amounts reported on the City's Statement of Net Position that relate to the

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VI  
ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

System and are not attributable to employer contributions. That is, it is the change in NPL plus the changes in deferred outflows and inflows plus employer contributions.

Alternatively, annual pension expense can be calculated by its individual components. While GASB does not require or suggest the organization of the individual components shown in the table below, we believe it helps to understand the level and volatility of pension expense.

<b>Table VI - 5 Calculation of Pension Expense</b>	
Change in Net Pension Liability	\$ (121,283)
Change in Deferred Outflows	0
Change in Deferred Inflows	138,561
Employer Contributions	<u>110,629</u>
<b>Pension Expense</b>	<b>\$ 127,907</b>
<b>Pension Expense as % of Payroll</b>	<b>25.12%</b>
<b>Operating Expenses</b>	
Service Cost	\$ 78,331
Employee Contributions	(27,760)
Administrative Expenses	<u>628</u>
Total	\$ 51,199
<b>Financing Expenses</b>	
Interest Cost	\$ 257,219
Expected Return on Assets	<u>(145,871)</u>
Total	\$ 111,349
<b>Changes</b>	
Benefit Changes	\$ 0
Recognition of Assumption Changes	0
Recognition of Liability Gains and Losses	(4,067)
Recognition of Investment Gains and Losses	<u>(30,573)</u>
Total	\$ (34,640)
<b>Pension Expense</b>	<b>\$ 127,907</b>

*Amounts in Thousands*

First, there are components referred to as operating expenses. These are items directly attributable to the operation of the plan during the measurement year. Service cost less employee contributions represents the increase in employer-provided benefits attributable to the year, and administrative expenses are the cost of operating the System for the year.

**SECTION VI**  
**ACCOUNTING AND FINANCIAL REPORTING UNDER GASB 67 AND 68**

Second, there are the financing expenses: the interest on the Total Pension Liability less the expected return on assets. Since the discount rate is equal to the long-term expected return on assets, the financing expense is just the interest on the Net Pension Liability.

The final category is changes. This category will drive most of the volatility in pension expense from year to year. It includes any changes in benefits made during the year and recognized amounts due to assumption changes, gains or losses on the TPL, and investment gains or losses. For the current first year, there is an investment gain recognized that effectively reduces the financing expense by about half.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VII  
ACTUARIAL SECTION OF THE CAFR**

The Government Finance Officers Association (GFOA) maintains a checklist of items to be included in the System's Comprehensive Annual Financial Report (CAFR) in order to receive recognition for excellence in financial reporting. The schedules in this section are listed by the GFOA for inclusion in the Actuarial Section of the System's CAFR.

Since the financial reporting for 2013 was based on results prior to the assumption changes adopted by the Board in September, the effect of those assumption changes is shown in FYE 2014.

<b>Table VII - 1</b>						
<b>Schedule Of Funding Progress</b>						
<b>Valuation Date June 30,</b>	<b>(1) Actuarial Value of Assets</b>	<b>(2) Actuarial Liability (AL)</b>	<b>(3) Percent Funded (1) / (2)</b>	<b>(4) Unfunded AL (UAL) (2) - (1)</b>	<b>(5) Annual Covered Payroll</b>	<b>(6) UAL as a % of Covered Payroll (4) / (5)</b>
2014	\$ 2,120,700	\$ 3,614,784	58.7%	\$ 1,494,084	\$ 509,267	293.4%
2013	1,961,939	3,055,606	64.2	1,093,668	508,032	215.3
2012	1,827,528	2,939,374	62.2	1,111,845	506,017	219.7
2011	1,834,620	2,752,909	66.7	918,289	513,322	178.9
2010	1,868,093	2,697,288	69.3	829,195	550,175	150.7
2009	1,895,148	2,518,094	75.3	622,946	539,468	115.5
2008	1,908,414	2,413,365	79.1	504,951	566,512	89.1
2007	1,816,508	2,166,119	83.9	349,611	535,079	65.3
2006	1,626,741	2,000,346	81.3	373,605	497,105	75.2
2005	1,511,553	1,795,514	84.2	283,962	467,998	60.7
2004	1,417,774	1,684,795	84.2	267,021	445,348	60.0
2003	1,330,584	1,504,125	88.5	173,541	416,472	41.7
2002	1,273,731	1,390,273	91.6	116,542	404,414	28.8
2001	1,291,338	1,259,564	102.5	(31,774)	376,913	-
2000	1,219,892	1,199,871	101.7	(20,021)	360,654	-
1999	1,117,497	1,044,425	107.0	(73,072)	336,153	-

*Dollar amounts in thousands*

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VII  
ACTUARIAL SECTION OF THE CAFR**

<b>Table VII - 2 Solvency Test</b>							
<b>Valuation Date</b>	<b>Aggregate Accrued Liabilities for</b>			<b>Valuation Assets</b>	<b>Portion of Accrued Liabilities Covered by Assets</b>		
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>		<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
	<b>Active Member Contributions</b>	<b>Retirees and Beneficiaries</b>	<b>Active Members Employer Portion</b>				
6/30/2014	\$393,754	\$2,099,274	\$1,121,756	\$2,120,700	100%	82%	0%
6/30/2013	396,583	1,881,123	1,201,741	1,962,533	100	83	0
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	1,816,509	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

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**SECTION VII  
ACTUARIAL SECTION OF THE CAFR**

**Table VII - 3  
Analysis Of Financial Experience**

	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>	<b>2009</b>	<b>2008</b>	<b>2007</b>	<b>2006</b>	<b>2005</b>
1. UAAL at Start of Year	\$ 1,516,915	\$ 1,111,845	\$ 918,289	\$ 829,195	\$ 622,946	\$ 504,950	\$ 349,611	\$ 373,605	\$ 283,961	\$ 267,021
2. Normal Cost for year	78,331	71,828	77,366	80,099	78,731	83,089	72,806	66,246	64,510	59,355
3. Contributions	(153,885)	(143,502)	(133,822)	(119,613)	(116,482)	(98,157)	(95,435)	(88,358)	(80,953)	(69,681)
4. Assumed Investment Income Accrual on (1), (2) and (3)	110,987	86,136	71,248	64,652	48,228	39,755	27,005	29,004	22,059	20,957
5. Expected UAAL Before Changes	\$ 1,552,347	\$ 1,126,307	\$ 933,081	\$ 854,333	\$ 633,424	\$ 529,637	\$ 353,987	\$ 380,496	\$ 289,577	\$ 277,651
6. Effect of Assumption Changes	-	423,247	-	-	-	-	-	-	49,051	-
7. Effect of Method Changes	-	-	-	-	-	-	74,539	-	-	-
8. Effect of Benefit Changes	-	-	-	-	-	-	-	-	-	-
9. Expected UAAL After Changes	\$ 1,552,347	\$ 1,549,554	\$ 933,081	\$ 854,333	\$ 633,424	\$ 529,637	\$ 428,526	\$ 380,496	\$ 338,629	\$ 277,651
10. Actual UAAL	1,494,084	1,516,915	1,111,845	918,289	829,195	622,946	504,950	349,611	373,605	283,961
11. Gain / (Loss) [9. - 10.]	\$ 58,263	\$ 32,639	\$ (178,764)	\$ (63,956)	\$ (195,771)	\$ (93,309)	\$ (76,424)	\$ 30,885	\$ (34,976)	\$ (6,310)
12. As % of AAL at Start of Year	1.7%	1.1%	(6.5)%	(2.4)%	(7.8)%	(3.9)%	(3.5)%	1.5%	(1.9)%	(0.4)%

*Dollar amounts in thousands*

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

<b>Table A - 1</b>						
<b>Active Member Data</b>						
	<b>June 30, 2014</b>			<b>June 30, 2013</b>		<b>% Change</b>
	<b>Tier 1</b>	<b>Tier 2</b>	<b>Total</b>	<b>Total</b>		
<b>Total</b>						
Count	7,421	310	7,731	8,090		-4.4%
Average Current Age	47.2	38.4	46.8	46.8		0.0%
Average Vesting Service	13.3	0.6	12.8	12.8		-0.4%
Prior Year Actual Annualized Pensionable Earnings						
Total	\$ 493,562,875	\$ 15,704,388	\$ 509,267,263	\$ 508,031,593		0.2%
Average	\$ 66,509	\$ 50,660	\$ 65,874	\$ 62,798		4.9%

<b>Table A - 2</b>						
<b>Non-Active Member Data</b>						
	<b>Count</b>			<b>Average Age</b>		
	<b>June 30, 2014</b>	<b>June 30, 2013</b>	<b>% Change</b>	<b>June 30, 2014</b>	<b>June 30, 2013</b>	<b>% Change</b>
<b>Total</b>						
Retirees	5,080	4,653	9.2%	68.4	68.6	-0.4%
Disableds	249	246	1.2%	63.1	62.5	1.0%
Beneficiaries & QDROs	961	925	3.9%	72.3	72.1	0.4%
Payee Total	6,290	5,824	8.0%	68.8	68.9	-0.2%
Deferred Vested	816	788	3.6%	48.7	48.5	0.3%

<b>Table A - 3</b>						
<b>Non-Active Member Data</b>						
	<b>Total Annual Benefit*</b>			<b>Average Annual Benefit*</b>		
	<b>June 30, 2014</b>	<b>June 30, 2013</b>	<b>% Change</b>	<b>June 30, 2014</b>	<b>June 30, 2013</b>	<b>% Change</b>
<b>Total</b>						
Retirees	\$ 168,443,463	\$ 150,600,135	11.8%	\$ 33,158	\$ 32,366	2.4%
Disableds	3,639,564	3,557,536	2.3%	14,617	14,462	1.1%
Beneficiaries & QDROs	17,301,146	16,199,651	6.8%	18,003	17,513	2.8%
Payee Total	\$ 189,384,173	\$ 170,357,322	11.2%	\$ 30,109	\$ 29,251	2.9%
Deferred Vested	\$ 9,956,781	\$ 9,526,523	4.5%	\$ 12,202	\$ 12,089	0.9%

\* Benefits provided in June 30 valuation data



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Table A - 4  
Distribution Of Active Tier 1 Members As Of June 30, 2014**

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	1	34	8	0	0	0	0	0	0	0	0	43
25 to 29	4	114	183	7	0	0	0	0	0	0	0	308
30 to 34	10	121	351	139	7	0	0	0	0	0	0	628
35 to 39	11	101	307	297	131	5	0	0	0	0	0	852
41 to 44	9	99	323	375	261	90	4	0	0	0	0	1,161
45 to 49	4	89	260	297	301	214	150	22	0	0	0	1,337
50 to 54	11	59	263	278	266	216	247	47	4	0	0	1,391
55 to 59	3	43	160	220	233	149	134	68	14	0	0	1,024
60 to 64	1	23	109	109	102	89	68	20	6	0	0	527
65 to 69	0	1	35	27	23	15	18	5	2	2	2	128
70 & up	0	1	4	7	4	2	2	2	0	0	0	22
<b>Total</b>	<b>54</b>	<b>685</b>	<b>2,003</b>	<b>1,756</b>	<b>1,328</b>	<b>780</b>	<b>623</b>	<b>164</b>	<b>26</b>	<b>2</b>	<b>2</b>	<b>7,421</b>

**Table A - 5  
Distribution Of Average Expected Salary <sup>1</sup> For Active Tier 1 Members As Of June 30, 2014**

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	\$ 31,350	\$ 43,141	\$ 43,061	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 42,852
25 to 29	46,305	48,685	48,384	54,555	0	0	0	0	0	0	0	48,609
30 to 34	38,975	50,832	55,589	59,237	66,308	0	0	0	0	0	0	55,335
35 to 39	49,908	54,206	61,335	66,468	68,005	93,367	0	0	0	0	0	63,345
41 to 44	58,835	55,272	60,089	70,108	73,659	77,667	77,845	0	0	0	0	67,379
45 to 49	57,525	56,957	60,483	64,202	74,037	79,224	80,619	77,752	0	0	0	69,660
50 to 54	47,228	53,143	58,320	67,885	70,556	78,288	81,097	80,166	77,262	0	0	70,202
55 to 59	43,253	61,303	59,891	64,282	68,938	76,872	76,272	87,751	68,768	0	0	69,489
60 to 64	40,897	67,795	59,601	67,248	68,429	75,726	82,447	93,605	83,842	0	0	70,451
65 to 69	0	40,147	62,803	65,855	67,155	88,122	81,931	82,414	91,724	149,195	0	72,277
70 & up	0	33,574	51,210	61,443	71,114	67,337	102,650	74,082	0	0	0	65,505
<b>Total</b>	<b>\$ 48,242</b>	<b>\$ 53,413</b>	<b>\$ 58,160</b>	<b>\$ 66,212</b>	<b>\$ 71,176</b>	<b>\$ 78,168</b>	<b>\$ 80,164</b>	<b>\$ 84,620</b>	<b>\$ 75,319</b>	<b>\$ 149,195</b>	<b>\$ 0</b>	<b>\$ 66,504</b>

<sup>1</sup> The average expected salary amounts reported above are limited by the 401(a)(17) maximum compensation limit.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Table A - 6  
Distribution Of Active Tier 2 Members As Of June 30, 2014**

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	29	0	0	0	0	0	0	0	0	0	0	29
25 to 29	52	0	0	0	0	0	0	0	0	0	0	52
30 to 34	49	0	0	0	0	0	0	0	0	0	0	49
35 to 39	57	1	0	0	0	0	0	0	0	0	0	58
41 to 44	35	0	0	0	0	0	0	0	0	0	0	35
45 to 49	32	0	0	0	0	0	0	0	0	0	0	32
50 to 54	28	1	0	0	0	0	0	0	0	0	0	29
55 to 59	15	2	0	0	0	0	0	0	0	0	0	17
60 to 64	9	0	0	0	0	0	0	0	0	0	0	9
65 to 69	0	0	0	0	0	0	0	0	0	0	0	0
70 & up	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>306</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>310</b>

**Table A - 7  
Distribution Of Average Expected Salary <sup>1</sup> For Active Tier 2 Members As Of June 30, 2014**

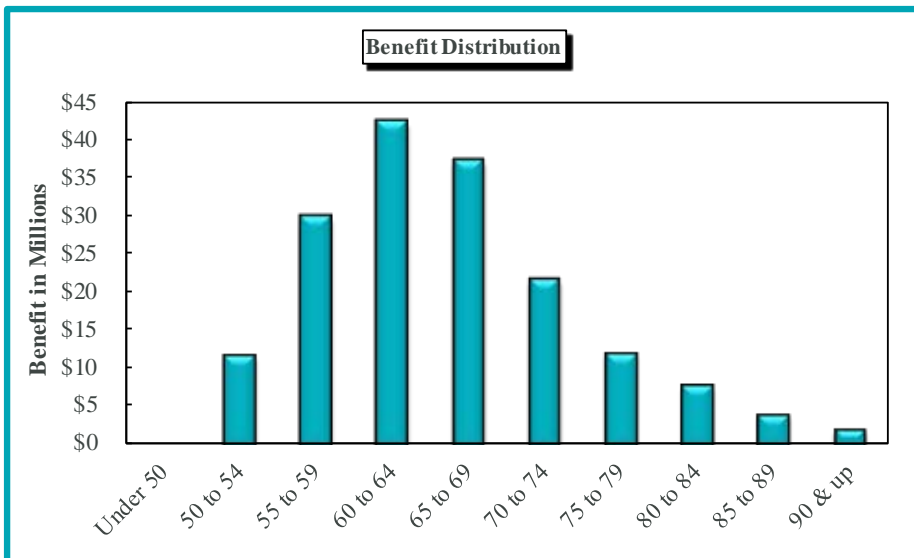
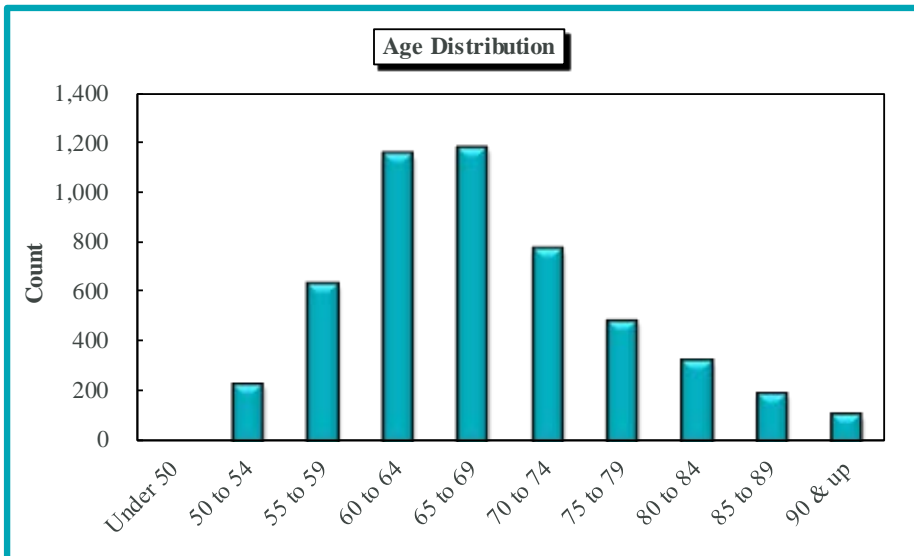
Age	Years of Vesting Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	\$ 39,855	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 39,855
25 to 29	46,440	0	0	0	0	0	0	0	0	0	0	46,440
30 to 34	46,722	0	0	0	0	0	0	0	0	0	0	46,722
35 to 39	45,600	41,344	0	0	0	0	0	0	0	0	0	45,527
41 to 44	55,763	0	0	0	0	0	0	0	0	0	0	55,763
45 to 49	55,601	0	0	0	0	0	0	0	0	0	0	55,601
50 to 54	50,903	96,665	0	0	0	0	0	0	0	0	0	52,481
55 to 59	85,222	65,312	0	0	0	0	0	0	0	0	0	82,880
60 to 64	58,195	0	0	0	0	0	0	0	0	0	0	58,195
65 to 69	0	0	0	0	0	0	0	0	0	0	0	0
70 & up	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>\$ 50,384</b>	<b>\$ 67,158</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 50,601</b>

<sup>1</sup> The average expected salary amounts reported above are limited by the 401(a)(17) maximum compensation limit.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

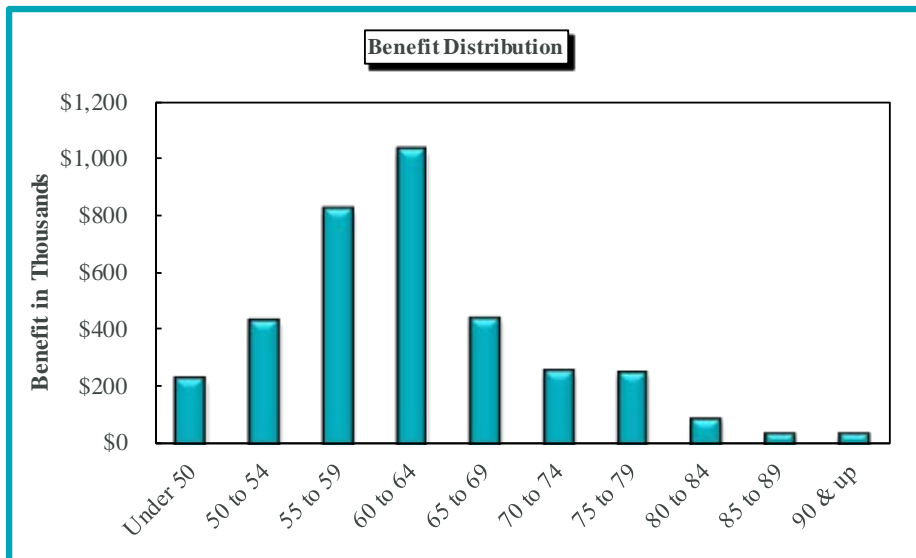
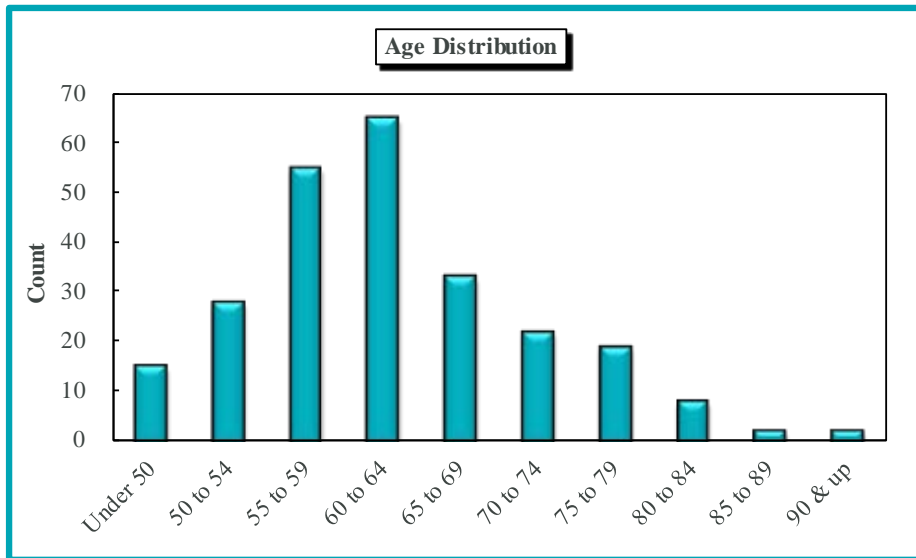
<b>Age</b>	<b>Count</b>	<b>Annual Benefit</b>
Under 50	4	\$ 203,441
50 to 54	230	11,632,080
55 to 59	633	29,873,715
60 to 64	1,154	42,383,640
65 to 69	1,181	37,309,437
70 to 74	772	21,616,428
75 to 79	486	11,965,685
80 to 84	322	7,652,817
85 to 89	193	3,912,100
90 & up	105	1,894,119
<b>Total</b>	<b>5,080</b>	<b>\$ 168,443,463</b>



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

<b>Age</b>	<b>Count</b>	<b>Annual Benefit</b>
Under 50	15	\$ 228,927
50 to 54	28	434,518
55 to 59	55	825,977
60 to 64	65	1,034,225
65 to 69	33	443,139
70 to 74	22	255,600
75 to 79	19	253,579
80 to 84	8	90,034
85 to 89	2	35,454
90 & up	2	38,109
<b>Total</b>	<b>249</b>	<b>\$ 3,639,564</b>

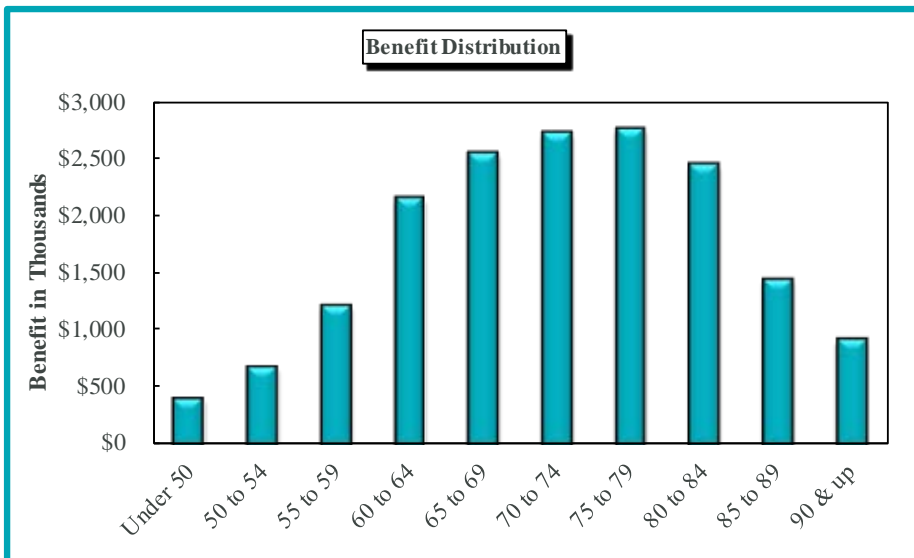
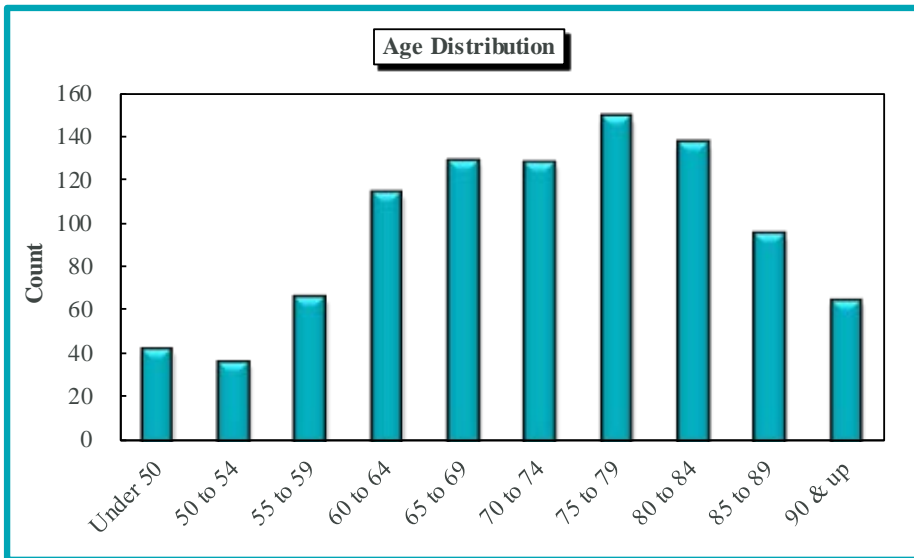


**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Table A - 10  
Distribution Of Beneficiaries & QDROs As Of June 30, 2014**

<b>Age</b>	<b>Count</b>	<b>Annual Benefit</b>
Under 50	42	\$ 399,296
50 to 54	36	677,373
55 to 59	66	1,214,032
60 to 64	114	2,154,161
65 to 69	129	2,552,903
70 to 74	128	2,727,288
75 to 79	149	2,762,639
80 to 84	137	2,448,404
85 to 89	95	1,450,321
90 & up	65	914,729
<b>Total</b>	<b>961</b>	<b>\$ 17,301,146</b>

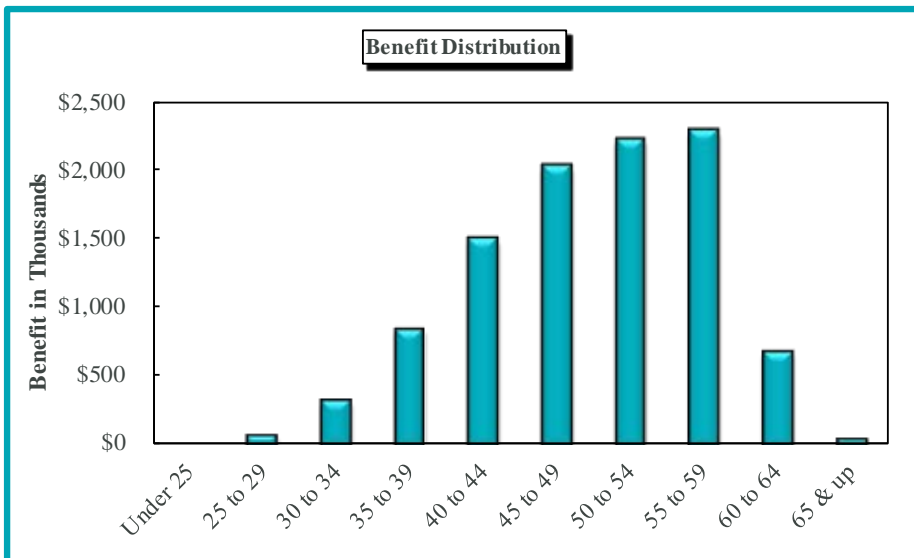
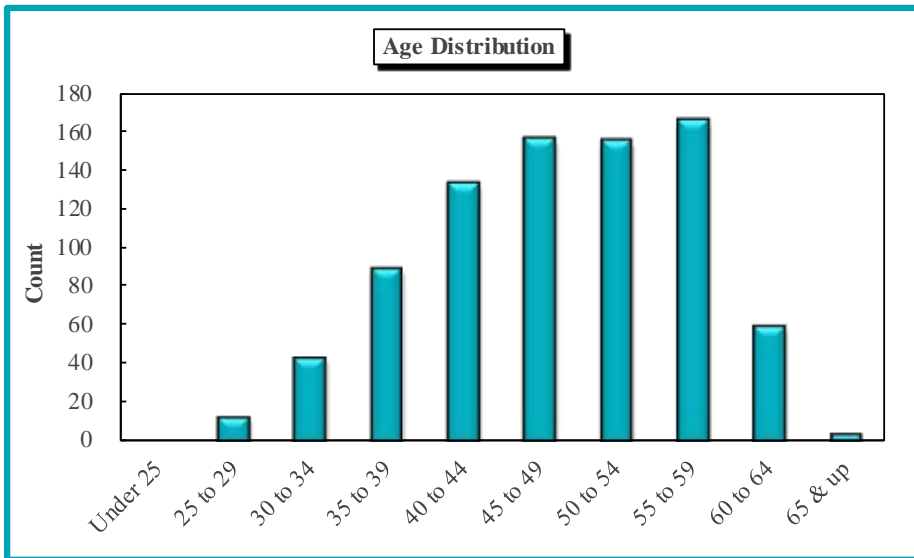


**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Table A - 11  
Distribution Of Terminated Vesteds As Of June 30, 2014**

<b>Age</b>	<b>Count</b>	<b>Annual Benefit</b>
Under 25	0	\$ -
25 to 29	12	62,049
30 to 34	43	314,578
35 to 39	89	840,210
40 to 44	133	1,495,722
45 to 49	156	2,025,573
50 to 54	155	2,225,058
55 to 59	166	2,286,892
60 to 64	59	677,269
65 & up	3	29,431
<b>Total</b>	<b>816</b>	<b>\$ 9,956,781</b>



**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

		Terminated					Spouses	Total
		Actives	Vested	Retired	QDROs	Disabled		
1.	June 30, 2013 valuation	8,090	788	4,653	121	246	804	14,702
2.	Additions							
	a. New entrants	377						377
	b. New Beneficiary/QDRO				19		58	77
	c. Total	377			19		58	454
3.	Reductions							
	a. Terminated - not vested	(123)						(123)
	b. Paid Out	(5)	(27)					(32)
	c. Benefits expired						(1)	(1)
	d. Deaths	(9)	(5)	(104)	(5)	(5)	(35)	(163)
	e. Total	(137)	(32)	(104)	(5)	(5)	(36)	(319)
4.	Changes in status							
	a. Terminated - vested	(121)	121					
	b. Returned to work	19	(19)					
	c. Retired	(497)	(34)	531				
	d. Disabled		(8)			8		
	e. Data corrections							
	f. Total	(599)	60	531		8		
5.	June 30, 2014 valuation	7,731	816	5,080	135	249	826	14,837

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)						
6/30/2014	597	\$20,138	\$1,810	145	\$3,232	6,155	\$187,559	\$30,473	11.1%
6/30/2013	426	12,574	-	201	3,996	5,703	168,843	29,606	5.4
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

(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, 2014 ACTUARIAL VALUATION**

**APPENDIX A  
MEMBERSHIP INFORMATION**

**Table A - 14  
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	816	816	-	-	-	-	-	-
\$1 - \$300	88	-	51	1	-	11	13	12
301 - 400	147	-	93	6	2	35	3	8
401 - 500	136	-	86	10	4	26	2	8
501 - 600	137	-	84	5	8	29	5	6
601 - 700	167	-	91	3	12	47	6	8
701 - 800	173	-	92	4	14	38	12	13
801 - 900	181	-	111	6	21	33	7	3
901 - 1,000	169	-	87	3	15	46	7	11
1,001 - 1,100	185	-	110	3	12	41	10	9
1,101 - 1,200	178	-	116	1	15	28	6	12
1,201 - 1,300	165	-	109	2	15	26	6	7
1,301 - 1,400	177	-	122	-	11	28	9	7
1,401 - 1,500	171	-	129	2	4	23	8	5
1,501 - 2,000	763	-	602	15	27	78	26	15
2,001 - 2,500	801	-	697	1	15	72	11	5
2,501 - 3,000	669	-	611	-	7	37	11	3
3,001 - 4,000	934	-	877	-	3	42	11	1
4,001 - 5,000	531	-	513	-	2	14	2	-
Over 5,001	518	-	499	-	-	14	3	2
Totals	7,106	816	5,080	62	187	668	158	135

**Table A - 15  
Schedule Of Retired Members By Benefit Option**

Monthly Benefit	Total	Option Selected						Child Benefit
		Life	Option A		Option B		Option C	
			Standard	Pop-Up	Standard	Pop-Up		
\$1 - \$300	88	44	21	7	-	-	3	13
301 - 400	147	94	30	8	2	3	10	-
401 - 500	136	84	38	7	-	1	6	-
501 - 600	137	78	23	19	3	1	13	-
601 - 700	167	105	30	18	2	3	9	-
701 - 800	173	107	31	18	3	5	9	-
801 - 900	181	94	35	25	5	11	11	-
901 - 1,000	169	110	27	17	6	4	5	-
1,001 - 1,100	185	122	36	16	3	4	4	-
1,101 - 1,200	178	90	59	12	2	9	6	-
1,201 - 1,300	165	82	42	24	4	8	5	-
1,301 - 1,400	177	93	43	12	8	14	7	-
1,401 - 1,500	171	101	32	17	3	16	2	-
1,501 - 2,000	763	333	215	94	31	50	40	-
2,001 - 2,500	801	343	242	94	27	67	28	-
2,501 - 3,000	669	281	165	89	40	63	31	-
3,001 - 4,000	934	361	292	108	34	92	47	-
4,001 - 5,000	531	197	162	67	29	57	19	-
Over 5,001	518	207	169	54	21	44	23	-
Totals	6,290	2,926	1,692	706	223	452	278	13
Deferred	816							
Total	7,106							

\* 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**

As the new actuaries to the Board beginning with the June 30, 2012 actuarial valuation, we reviewed some of the key economic assumptions with the Board. Some significant changes were adopted by the Board in September 2013. The prior assumptions, adopted by the Board based on the prior actuary's recommendations, did not fall within our best estimate range of future experience. The demographic assumptions were adopted by the Board based on an experience study covering the period from July 1, 2004 through June 30, 2009 and recommendations from the prior actuary. We will be completing an experience study before the June 30, 2015 actuarial valuation in which we will review all of the assumptions and methods, including the demographic assumptions.

**1. Discount Rate**

The discount rate of 7.50% is based on the expected return on assets and was adopted by the Board in September 2013. For the stochastic projections, a standard deviation of 10.5% is assumed.

**2. Salary Increase Rate**

Individual salary increases are composed of a price inflation component, a real wage growth component, and a merit or longevity component that varies by age. In September 2013, the Board adopted a reduced price inflation component.

<b>Component</b>	<b>Adopted September 2013</b>
Price inflation:	3.00%
Real wage growth	<u>0.50%</u>
Wage inflation	3.50%

The table below combines the various components of salary increases for sample ages.

<b>Age</b>	<b>Price Inflation</b>	<b>Real Wage Growth</b>	<b>Merit or Longevity</b>	<b>Total</b>
20	3.00%	0.50%	3.80%	7.30%
25	3.00%	0.50%	3.10%	6.60%
30	3.00%	0.50%	2.70%	6.20%
35	3.00%	0.50%	2.40%	5.90%
40	3.00%	0.50%	2.20%	5.70%
45	3.00%	0.50%	1.60%	5.10%
50	3.00%	0.50%	1.10%	4.60%
55	3.00%	0.50%	0.60%	4.10%
60	3.00%	0.50%	0.10%	3.60%
65	3.00%	0.50%	0.00%	3.50%

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**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. These rates were adopted November 17, 2005 and first used for the June 30, 2006 valuation.

Sample rates of mortality are shown in the table below.

<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, 2014 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

**7. Rates of Retirement**

Rates of retirement are based on age according to the following table. Tier 1 rates were adopted November 17, 2005 and first used for the June 30, 2006 valuation. Tier 2 rates were adopted October 17, 2013 and first used for the June 30, 2013 valuation.

**CITY OF PHOENIX EMPLOYEES' RETIREMENT SYSTEM  
JUNE 30, 2014 ACTUARIAL VALUATION**

**APPENDIX B  
ACTUARIAL ASSUMPTIONS AND METHODS**

<b>Rates of Retirement</b>		
<b>Age</b>	<b>All Tier 1 and Tier 2 (except Rule of 87)</b>	<b>Tier 2 Rule of 87</b>
50 – 54	25%	35%
55	35	35
56 – 60	25	35
61	20	30
62	35	50
63	30	40
64	25	35
65	45	60
66 – 69	30	40
70+	100	100

**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. Pension Equalization Reserve**

In September 2013, the Board adopted an assumption valuing future benefits payable through the PER as a 1.5% annual compound cost-of-living adjustment (COLA).

**10. Changes Since Last Valuation**

None

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

**Contribution Allocation Procedure**

The contribution allocation procedure primarily consists of an actuarial cost method, an asset smoothing method, and an amortization method as described below. The most recent changes were adopted by the Board in September 2013.

**1. Actuarial Cost Method**

The entry age (EA) 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. Or, equivalently, it is the accumulation of normal costs for all periods prior to the valuation date. The normal cost and actuarial liability are calculated on an individual basis. The sum of the individual amounts is the normal cost and actuarial liability for the System.

**2. Asset Valuation Method**

For the purposes of determining contribution rates, an actuarial value of assets is used that dampens the volatility in market values that occur because of the fluctuations in market conditions. 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 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.

**3. Amortization Method**

The unfunded actuarial liability (UAL) is the difference between the actuarial liability and the actuarial value of assets. The UAL is amortized over periods in accordance with the following amortization methods.

- The UAL as of June 30, 2013, developed prior to implementing the September 2013 assumption changes, is amortized over a closed 25-year period as a level percentage of payroll.
- The impact of the September 2013 assumption changes on the UAL is amortized over a closed 25-year period as a level percentage of payroll with a four-year phase-in to the full amortization rate. The phase-in is calculated by multiplying the first year amortization payment by 25 percent. For the second year, the amortization schedule is recalculated reflecting the 25 percent payment in the first year and the remaining 24-year period and the calculated amortization payment is

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

then multiplied by 50 percent. The process is repeated until the full amortization payment is made beginning in the fourth year of the 25-year period.

- Future gains and losses are amortized over closed 20-year periods as a level percentage of payroll from the valuation date in which they are first recognized. However, gains will not be amortized over a shorter period than the remaining period on the amortization of the 2013 UAL.

The total contribution rate is the sum of the normal cost rate (including assumed administrative expenses) and the UAL rate. The normal cost rate is determined by dividing the total normal cost determined under the actuarial cost method by the payroll expected for members active on the valuation date. The UAL rate is determined by dividing the UAL payments determined under the amortization method described above by the total expected payroll for the year (including members active on the valuation date and new entrants expected to replace active members who are expected to leave employment). These rates are determined for the fiscal year immediately following the valuation date, but are applied one year later without adjustment.

For Tier 1, members contribute 5 percent of pay and the City contributes the remainder of the total contribution rate. For Tier 2, the members and the City each pay half of the total contribution rate.

**Changes Since Last Valuation**

The administrative expense assumption was added. In prior years, the discount rate was assumed to be net of administrative expenses.

**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.

Members who were hired before July 1, 2013, as well as members who join the City after July 1, 2013 who were members of ASRS prior to July 1, 2011 and did not withdraw their contributions are Tier 1 members.

Members hired into employment with the City on or after July 1, 2013 who are not Tier 1 members are Tier 2 members.

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

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

**3. Credited Service**

Credited service is determined based on Section 14 of Chapter XXIV of the Phoenix City Charter as well as COPERS administrative policy number 43. In no case is more than a year of service credited to any member for all service rendered in any calendar year. The amount of service credited to members varies by Tier, as detailed below.

*Tier 1*

A member is credited with a month of service for each calendar month in which the member performs at least 10 days of City service. A member is credited with a year of service for any calendar year in which the member has at least 10 months of credited service. If a member has less than 10 months of credited service for any calendar year, they are credited for the actual number of months.

*Tier 2*

A member is credited with a month of service for each calendar month in which the member performs at least 20 days of City service. A member is credited with a year of service for any calendar year in which the member has at least 12 months of credited service. If a member has less than 12 months of credited service for any calendar year, they are credited for the actual number of months.

APPENDIX C  
SUMMARY OF PLAN PROVISIONS

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

Tier 1

*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 0.5% 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).

*Minimum Benefit:*

Minimum monthly pension is \$250 (\$500 if member has 15 or more years of service).

Tier 2

*Eligibility:*

Sum of age and credited service equals 87 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 FAC times credited service times the corresponding accrual rate:

<b>Years of Service</b>	<b>Accrual Rate</b>
0 < Service ≤ 20	2.10%
20 < Service ≤ 25	2.15%
25 < Service ≤ 30	2.20%
Service > 30	2.30%

Note that for Tier 2, the same accrual rate will apply for each year of service, based on the total 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.



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

**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 for Tier 1 members and 15.75% for Tier 2 members. Maximum during worker's compensation period is difference between final compensation and annualized workers compensation. At expiration of worker's compensation period, amount is recomputed to include years during which worker's 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.

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

**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

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. Total Required Annual Contribution**

Actuarially determined normal cost plus an amortization payment on the unfunded actuarial liability stated as a percentage of projected member compensation

**12. Member Contributions**

Tier 1: 5% of pay  
Tier 2: 50% of total contribution rate

**13. City Contributions**

Total Required Annual Contribution less Member Contributions

**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. It represents the amount of assets the System should have today according to the allocation of costs in the actuarial cost method. It 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. Actuarial Cost 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.”

**4. Actuarial Gain or Loss**

The difference between actual experience and assumed experience.

**5. Actuarial Present Value**

The amount of funds currently estimated to be 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.

**6. Actuarially Determined Contribution**

A target or recommended contribution for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

**7. Amortization**

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

**APPENDIX D  
GLOSSARY OF TERMS**

**8. Deferred Inflow of Resources**

An acquisition of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience gains on the Total Pension Liability, assumption changes reducing the Total Pension Liability, or investment gains that are recognized in future reporting periods.

**9. Deferred Outflow of Resources**

A consumption of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience losses on the Total Pension Liability, assumption changes increasing the Total Pension Liability, or investment losses that are recognized in future reporting periods.

**10. Entry Age Actuarial Cost Method**

The actuarial cost method selected for funding calculations and required for GASB 67 and 68 calculations. Under this method, the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this actuarial present value allocated to a valuation year is called the Service Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future service costs is called the Total Pension Liability.

**11. Measurement Date**

The date as of which the Total Pension Liability and Plan Fiduciary Net Position are measured. The Total Pension Liability may be projected from the Actuarial Valuation Date to the Measurement Date. The Measurement Date must be the same as the Reporting Date for the plan.

**12. Net Pension Liability**

The liability of employers and nonemployer contributing entities to employees for benefits provided through a defined benefit pension plan. It is calculated as the Total Pension Liability less the Plan Fiduciary Net Position.

**13. Normal Cost**

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

**APPENDIX D  
GLOSSARY OF TERMS**

**14. Plan Fiduciary Net Position**

The fair or market value of assets.

**15. Reporting Date**

The last day of the plan or employer's fiscal year.

**16. Service Cost**

The portion of the actuarial present value of projected benefit payments that is attributed to the current period of employee service in conformity with the requirements of GASB 67 and 68. The Service Cost is the normal cost calculated under the entry age actuarial cost method.

**17. Total Pension Liability**

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of GASB 67 and 68. The Total Pension Liability is the actuarial liability calculated under the entry age actuarial cost method.

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

The unfunded actuarial liability represents the difference between the actuarial liability and the assets. It can be measured either based on the actuarial value of assets or the market value of assets. This value is sometimes referred to as the "unfunded actuarial accrued liability."