# Fairfax County Police Officers Retirement System

## Actuarial Valuation as of July 1, 2013

Produced by Cheiron

March 2014

Classic Values, Innovative Advice

# Table of Contents

March 24, 2014

Board of Trustees
Fairfax County Police Officers
Retirement System
10680 Main Street, Suite 280
Fairfax, Virginia 22030-3812

***Re: Fairfax County Police Officers Retirement System***
***Actuarial Valuation as of July 1, 2013***

Dear Members of the Board:

At your request, we have conducted our annual actuarial valuation of the Fairfax County Police Officers Retirement System as of July 1, 2013. The results of the valuation are contained in this report. The purpose of this report is to present the annual actuarial valuation of the Fairfax County Police Officers Retirement System. This report is for the use of the Fairfax County Police Officers Retirement System Board of Trustees and its auditors in preparing financial reports in accordance with applicable law and accounting requirements.

Your attention is called to the Foreword in which we refer to the general approach employed in the preparation of this report. We also comment on the sources and reliability of both the data and the actuarial assumptions on which our findings are based. Those comments are the basis for our certification that this report is complete to the best of our knowledge and belief. The results of this report are only applicable to the County contribution for Fiscal Year 2015 and rely on future plan experience conforming to the underlying assumptions. To the extent that actual plan experience deviates from the underlying assumptions, the results would vary accordingly.

The assumptions and methods used in determining the assets, liabilities, and the annual required contributions of the employer as defined by the Government Accounting Standards Board (GASB) meet the parameters set by GASB Statement Number 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*.

In preparing our report, we relied on information (some oral and some written) supplied by the Retirement System. This information includes, but is not limited to, 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 Standards of Practice Number 23.

This report was prepared exclusively for the Fairfax County Police Officers Retirement System for the purpose described herein. This report is not intended to benefit any third party, and Cheiron assumes no duty or liability to any such party.



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

Sincerely,
Cheiron

Fiona E. Liston

Fiona E. Liston, FSA, EA
Principal Consulting Actuary

Christian Benjaminson

Christian E. Benjaminson, FSA, EA
Principal Consulting Actuary

## FOREWORD

Cheiron has performed the actuarial valuation of the Fairfax County Police Officers Retirement System as of July 1, 2013. The purpose of this report is to:

1) **Measure and disclose**, as of the valuation date, the financial condition of the System;

2) **Indicate trends** in the financial progress of the System;

3) **Determine the contribution rate** to be paid by the County for Fiscal Year 2015; and

4) **Provide specific information** and documentation required by the Governmental Accounting Standards Board (GASB).

An actuarial valuation establishes and analyzes system assets and liabilities on a consistent basis and traces the progress of both from one year to the next. It includes measurement of the System's investment performance as well as an analysis of actuarial liability gains and losses.

**Section I** presents a summary containing our findings and disclosing important trends experienced by the System in recent years.

**Section II** contains details on various asset measures, together with pertinent performance measurements.

**Section III** shows similar information on system liabilities, measured for actuarial, accounting, and governmental reporting purposes.

**Section IV** develops the County contribution rate, determined using actuarial techniques, and compares that to the rate developed using the corridor method of funding.

**Section V** includes the required disclosures under GASB Statement Number 25.

The appendices to this report contain a summary of the System's membership at the valuation date, a summary of the major provisions of the System, and the actuarial methods and assumptions used in the valuations.

In preparing our report, we relied on information (some oral and some written) supplied by the System's staff. This information includes, but is not limited to, 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 Number 23.

The actuarial assumptions reflect our understanding of the likely future experience of the System, and the assumptions taken individually represent our best estimate for the future experience of the System. The results of this report are dependent upon future experience conforming to these assumptions. To the extent that future experience deviates from the actuarial assumptions, the true cost of the System could vary from our results.

Finally, in preparing this report, we have conformed to generally accepted actuarial principles and practices which are consistent with the Code of Professional Conduct, and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

**SECTION I**
**BOARD SUMMARY**

## General Comments

Fairfax County's annual contribution to this System is determined by using a corridor funding method. Under this funding approach, the County's contribution rate is based on the normal cost rate plus expense rate determined as of the implementation date of the corridor method (July 1, 2001) 17.00% of payroll, plus an expense rate, currently 0.30% of payroll. This rate is adjusted for benefit and assumption changes but otherwise will remain the same as long as the System's actuarial funded ratio remains within a corridor of 90% to 120%.

The County's contribution rate will change when benefits are increased or modified or assumptions are changed. The new rate will reflect the change in normal cost rate and the change in actuarial liability amortized over 15 years. The changes in both normal cost and UAL rate are summarized in Section IV. The normal cost rate and actuarial accrued liability will continue to be measured using the entry age funding method. If the funded status falls outside the corridor, a credit (if above 120%) or charge (if below 90%) will be established based on a 15-year amortization equal to the amount necessary to re-enter the corridor. Once the funded status is within the corridor, the contribution rate will return to the normal cost rate plus expense rate and any remaining amortization for benefit or assumption changes.

The valuation as of July 1, 2013 shows that the actuarial funded ratio (including a credit for the amortization of prior benefit increases and assumption changes) remains outside of the corridor.

The employer contribution rate for FY 2015 as calculated under this method decreases from 32.72% to 31.82% of payroll, on the basis of this year's valuation results. The County's FY 2014 contribution was actually based on amortizing to reach 91% funded, rather than amortizing just to re-enter the corridor and in FY 2015 they are likely to contribute an amount to amortize to 93% funded. On that basis, the contribution in FY 2014 was 33.87% and for FY 2015 it will be 35.55%.

The calculated contribution rate for Governmental Accounting Standards Board (GASB) purposes is based on a rolling 15-year amortization of the actuarial unfunded liability.

## Trends

The System outperformed the investment assumption during the fiscal year ending in 2013, causing an actuarial gain on the asset side of the System. The actual return on a market value basis was approximately 9.57%. On an actuarial value basis, the assets returned 7.55% compared with an assumed rate of return of 7.5%. The gain recognized for funding purposes was $0.5 million.

## SECTION I
## BOARD SUMMARY

The measurement of liabilities produced a gain this year in the amount of $17.3 million. This gain was due to experience not meeting our assumptions about salary increases, retirement behavior, death, etc. Specific components of the gain include:

- The average salary increase was 0.8% for active participants who were in both the July 1, 2012 and July 1, 2013 valuations. This was less than the expected salary growth based on the actuarial assumption, which worked out to average 5.6%, which resulted in a gain of $15.7 million. The annual payroll was provided as of December 31, 2012 and adjusted to July 1, 2013, which included annualizing the 2.18% increase from July 1, 2012.

- The valuation assumed a 2.75% cost-of-living adjustment in 2013 for benefits in pay status (per the most recent experience study). The actual CPI-based COLA was 1.4% last year, creating a liability gain of $9.8 million.

- The 2013 valuation incorporates actual sick leave hours into both eligibility and projected benefits for active participants. The accrual of additional sick leave from 2012 to 2013 produced a loss of $2.4 million, as we do not currently include an assumption regarding sick leave accrual.

- An annual component of liability loss is the delayed recognition of new hires throughout the year. This does not contribute to an increase in the System's unfunded liability because both the member and the employer make contributions from the date of hire. However, when we look only at the liability side, they are a component of the annual liability loss, and this year they contributed $0.6 million to that number.

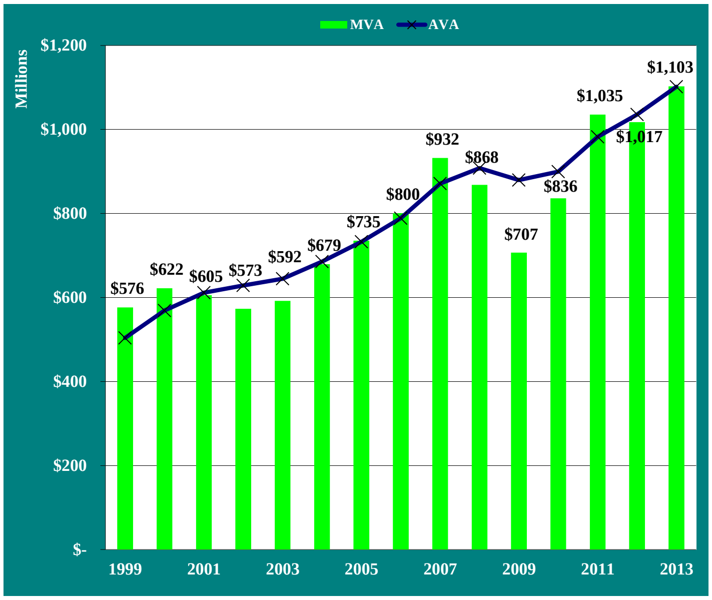
- There was a $5.2 million liability loss component that is made up of various other causes such as members terminating, retiring, dying or becoming disabled in a way contrary to the assumption and also data changes from previous years.

The combination of liability and investment experience and County plus member contributions over the last year led to the System's funding ratio (actuarial value of assets over actuarial accrued liability) increasing from 80.5% at July 1, 2012 to 82.1% at July 1, 2013. For purposes of measuring whether the System remains within the funding corridor, an adjusted funding ratio is used. In this ratio, there is an additional asset recognized in the amount of the unfunded actuarial liability (UAL) payments being made by the County to pay for benefit increases and assumption changes. On this basis, the System's actuarial funded ratio increased from 82.9% at July 1, 2012 to 84.2% at July 1, 2013.

It is important to take a step back from the latest results and view them in the context of the System's recent history. On the next two pages, we present a series of charts which display key factors in the valuations over the last 15 years. After the historical review, we present a few projection graphs, showing the possible condition of the System over the next 15 years under various market return scenarios.

# SECTION I
# BOARD SUMMARY

## Growth in Assets

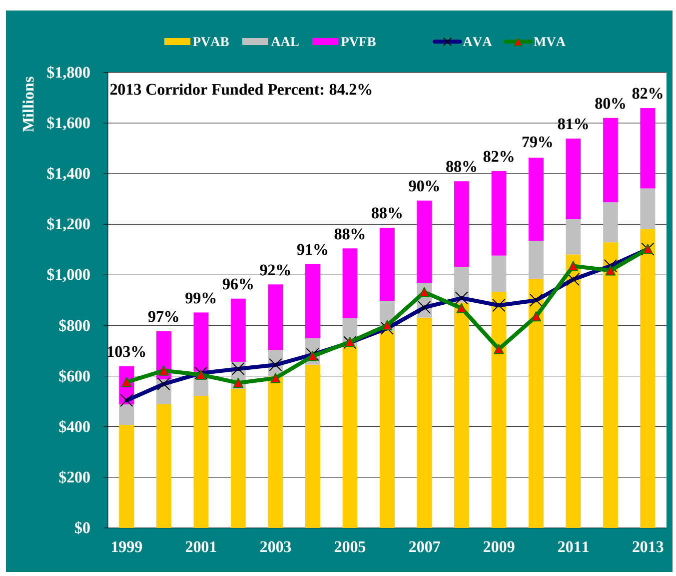



There was an increase in the market value of assets (MVA) over last year due to a return of 9.57%. The actuarial value of assets (AVA) increased as prior gains are phased-in. There are only $1 million left of unrecognized gains under this asset smoothing method, so the market and actuarial values of assets are almost equal.

Over the period of July 1, 1999 to June 30, 2013, the System's assets returned approximately 6.50% per year measured at actuarial value, compared to a valuation assumption of 7.5% per year.

## Assets and Liabilities

The three colored bars represent the three different measures of liability mentioned in this report. The amount represented by the top of the pink bars, the present value of future benefits (PVFB), is the amount needed to provide all benefits for the current participants and their beneficiaries. If the System had assets equal to the PVFB, no contributions would, in theory, be needed for the current members. For funding purposes, the target amount is represented by the top of the gray bar. We compare the actuarial value of assets to this measure of liability in developing the funded percent. These are the percentages shown in the graph labels.

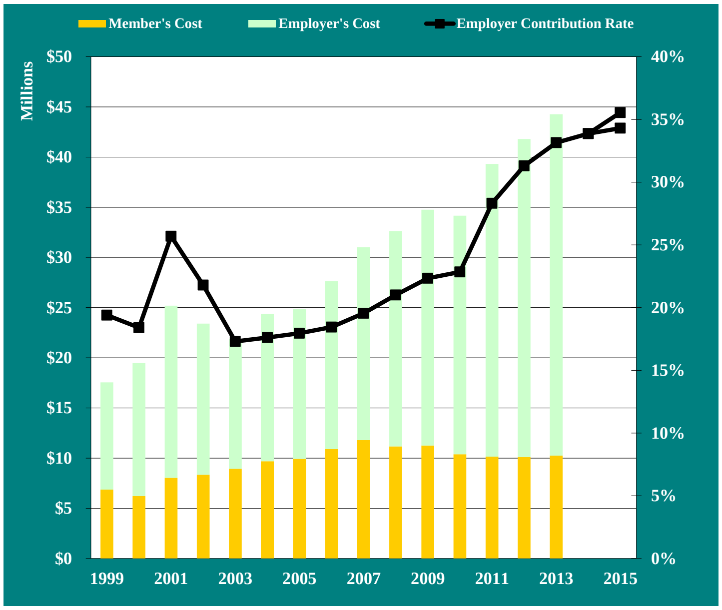



Since 2007, the System's funded status has declined from 90% to 82% as a result of investment gains and losses, liability gains and losses, and the underfunding inherent in the corridor method once it falls below 90%.

## SECTION I
## BOARD SUMMARY

Contribution Rates

The stacked bars in this graph show the contributions made by both the County and the members (left hand scale). The black line shows the County contribution rate as a percent of payroll (right hand scale).



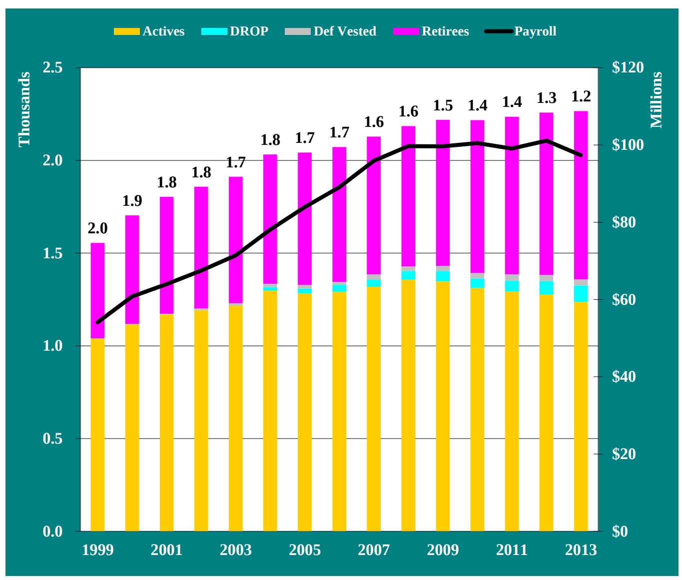

The member contribution rate is set by the County Ordinance. The County contribution rate is set by the actuarial process, as constrained by the corridor method. Note there is a lag in the rate shown. For example, the 2013 value is the rate prepared by the 2011 valuation and implemented for the period July 1, 2012 to June 30, 2013.

For FY 2015, the graph shows both the base corridor contribution rate and the anticipated rate using an "amortize to 93%" approach.

Participant Trends

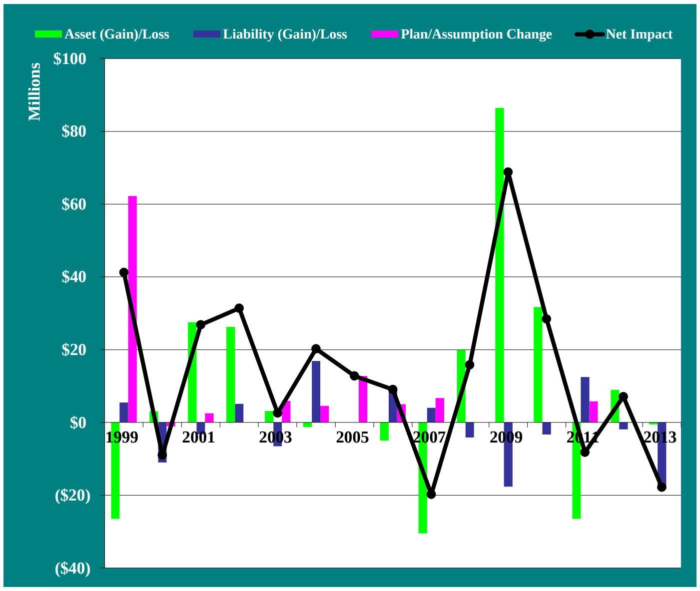
As with many funds in this country, there has been a steady growth in the number of retired members as the System has matured. The active-to-inactive ratio has decreased from 2.0 actives to each inactive in 1999 to 1.2 actives for each inactive today. While this would be an alarming trend in a pay-as-you-go system, the pool of invested assets has been established in anticipation of this development.

Starting in 2004, the chart also shows the number of DROP participants. Neither County nor member contributions are made on their behalf, which leads to a slightly lower growth in effective covered payroll for this System.



# SECTION I
# BOARD SUMMARY

## Gains and Losses




This graph shows the annual gains and losses experienced by the System, along with the change in unfunded actuarial liability (UAL) due to plan amendments and changes in assumptions. The black line shows the net impact of all such changes in a given year. Positive numbers represent increases in the UAL while negative numbers show reductions.

## Cash Flow

The graph shows the annual cash flows into and out of the System. The graph shows the magnitude of the investment returns on the market value (green bars) compared to the contributions (yellow bars). The net cash flow (line) is comparing the contributions to benefits and expenses (red bar). Negative cash flow is expected for a mature plan such as this one. The implications of a plan with negative cash flow are that the impact of market fluctuations can be more severe. This is because as assets are being depleted to pay benefits in down markets, there is less principal that is available to be reinvested during periods of favorable returns.

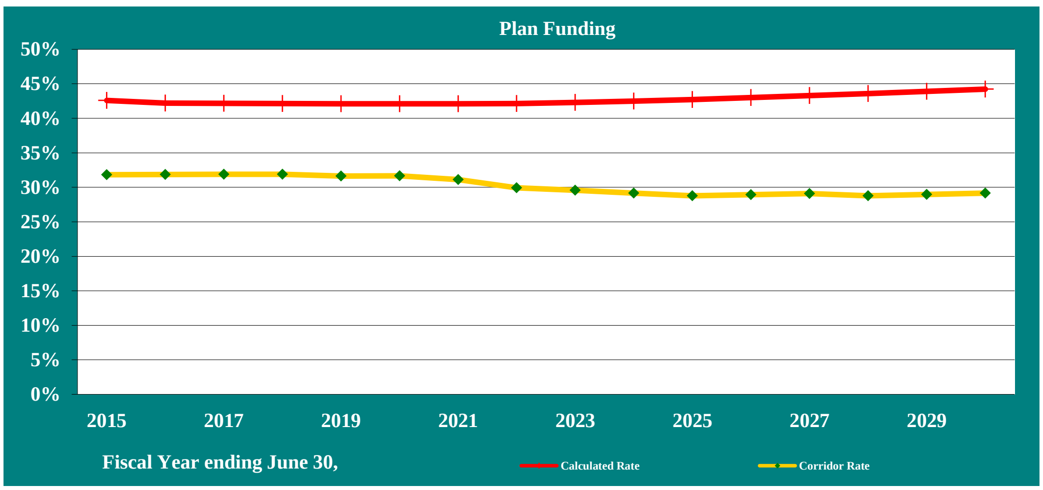
# SECTION I
# BOARD SUMMARY

## Future Outlook

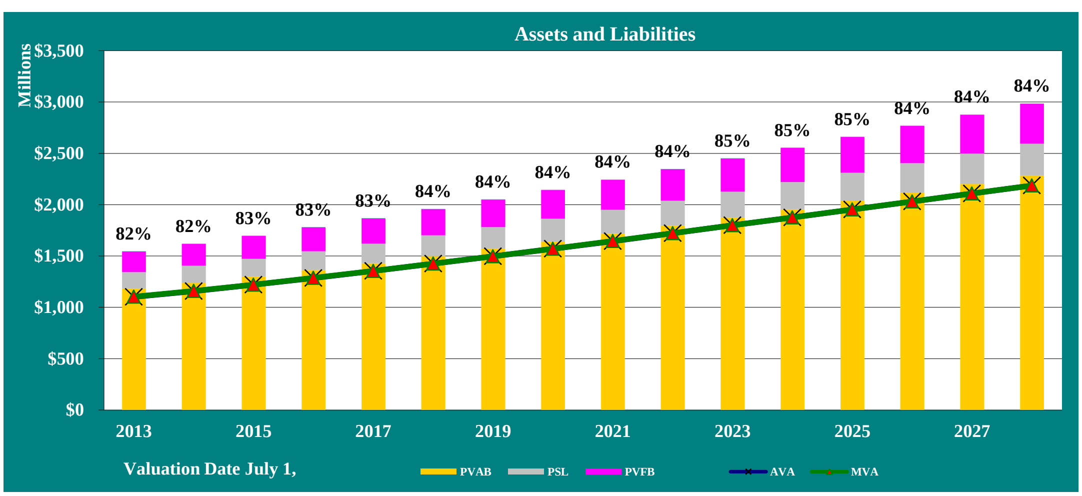
Base-line Projections

The two graphs below show the expected progress of the System over the next 15 years assuming the System's assets earn 7.5% on their *market value.*

The graph entitled "Plan Funding" shows the System not re-entering the corridor (if all other actuarial assumptions are met as well as the 7.5% interest rate). The decrease in corridor contributions towards the end of the period show plan change bases becoming fully amortized and dropping out. The red line shows the actuarially calculated rate if the corridor were not in place. Under this scenario, the corridor rate begins around 31.8% of payroll, remains stable for the next five years before drifting lower.

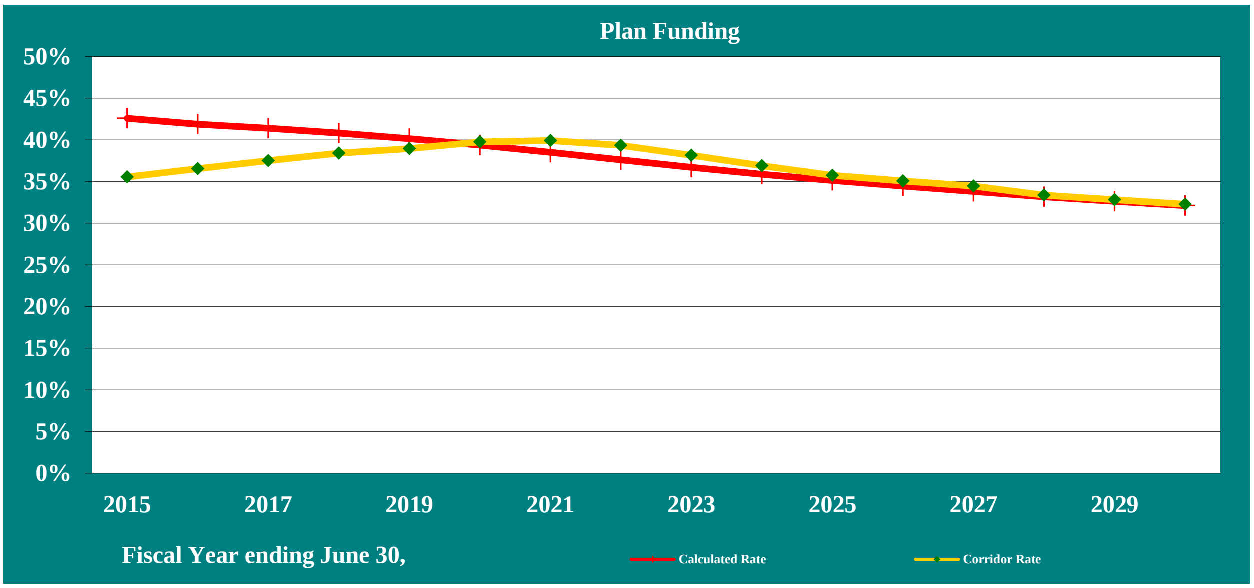


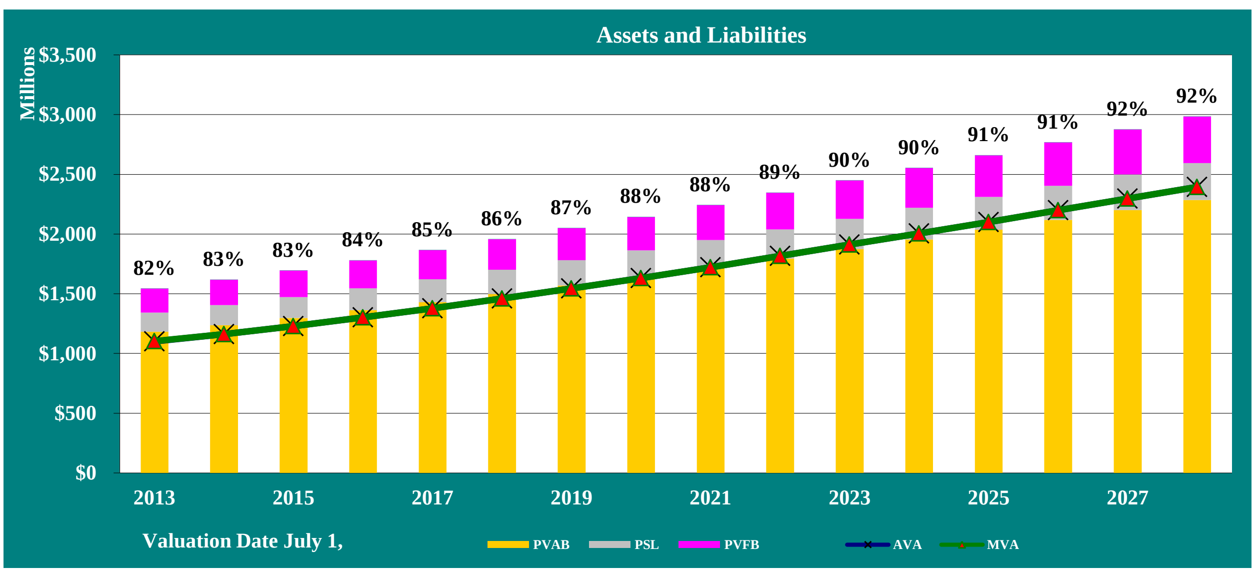

The "Assets and Liabilities" graph shows the projected funding status over the next decade. The System's funded status is projected to increase from the current level of 82% to 84% by 2018. After that, the corridor method basically marks time and keeps the System around 84% funded.



## SECTION I
## BOARD SUMMARY

While the County's written policy is to contribute to 90% of the corridor, for FY 2015, the County actually plans to contribute an amount based on amortizing to 93%. In FY 2016, the amortization target will increase to 94% and continue increasing each year until the amortization target is 100%. Under this scenario, the contribution rate would increase through 2021 before beginning its decline while the funding would steadily improve.



## SECTION I
## BOARD SUMMARY

The future funding status of this System will be influenced by the investment earnings. The prior projection assumed the System would earn 7.5% each and every year, which is extremely unlikely.

In the projections that follow, we show the risk to the System under volatile markets. Since 1980, the System has averaged 9.95% return per year. In the following charts, we show results assuming returns over the next 15 years average 5.0%, 7.5% and 10.0%. Different patterns of returns will produce different results from those shown here.

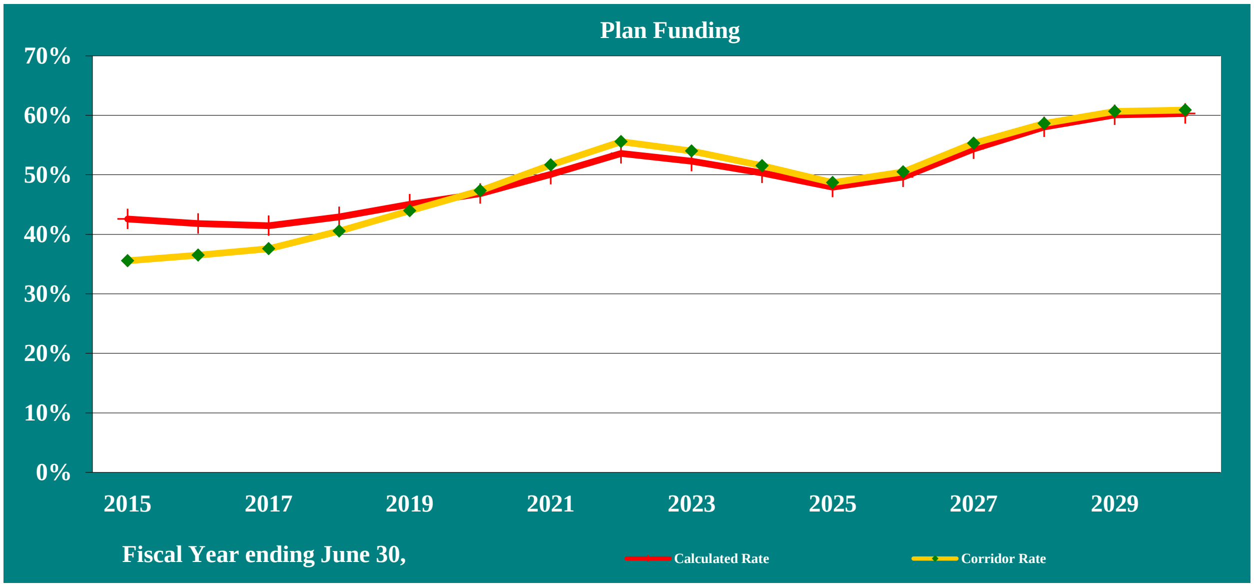
**Table I-1**

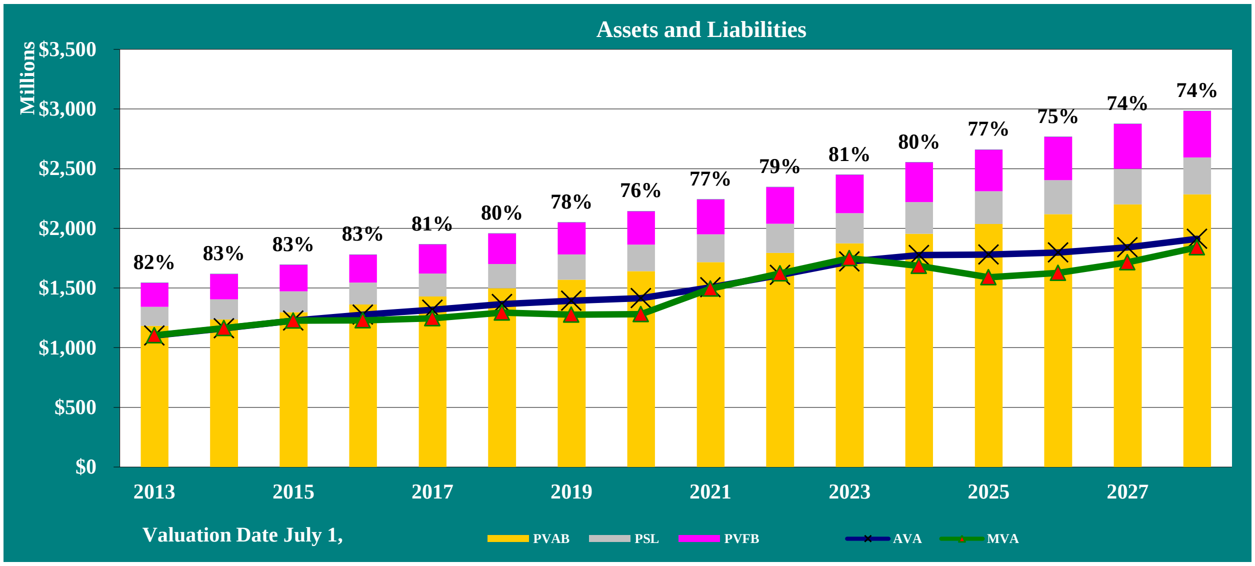
| Fiscal Year Ending June 30, | Average 5.0% | Average 7.5% | Average 10.0% |
|---|---|---|---|
| 2013 | 7.67% | 2.34% | -5.85% |
| 2014 | 7.05 | 7.17 | 4.54 |
| 2015 | 1.67 | 17.72 | 18.15 |
| 2016 | 2.98 | 30.01 | 32.56 |
| 2017 | 5.16 | 19.42 | -8.98 |
| 2018 | -0.19 | 5.61 | 12.47 |
| 2019 | 1.48 | 11.03 | 17.81 |
| 2020 | 17.59 | 4.30 | -13.95 |
| 2021 | 9.50 | 15.60 | 15.19 |
| 2022 | 9.25 | -0.44 | 14.83 |
| 2023 | -2.11 | 2.05 | 28.45 |
| 2024 | -3.75 | -8.37 | 24.92 |
| 2025 | 4.20 | 4.65 | 3.95 |
| 2026 | 7.27 | -0.59 | 7.37 |
| 2027 | 9.17 | 7.83 | 10.22 |
| **Average** | **5.00%** | **7.50%** | **10.00%** |

## SECTION I
## BOARD SUMMARY

Alternative Projection – with average return of 5.0% in the period

Under this scenario, the corridor contribution rate increases from 35% to 60% of payroll. The System funding drops to 74%, even with the ramping up of contributions from 93% of the corridor to 100%.

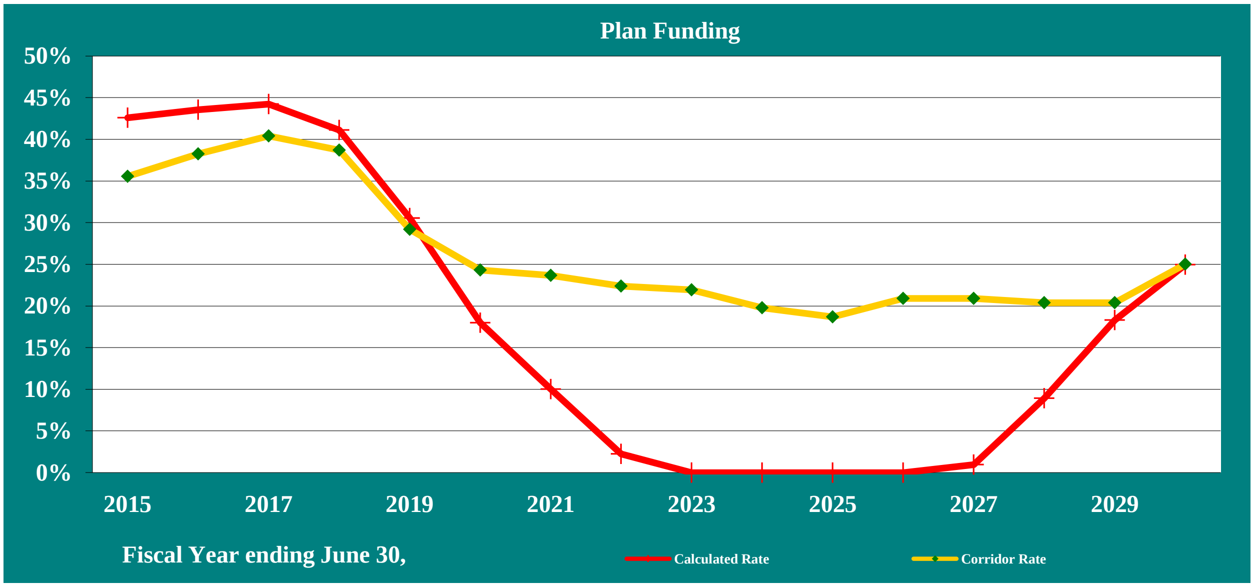


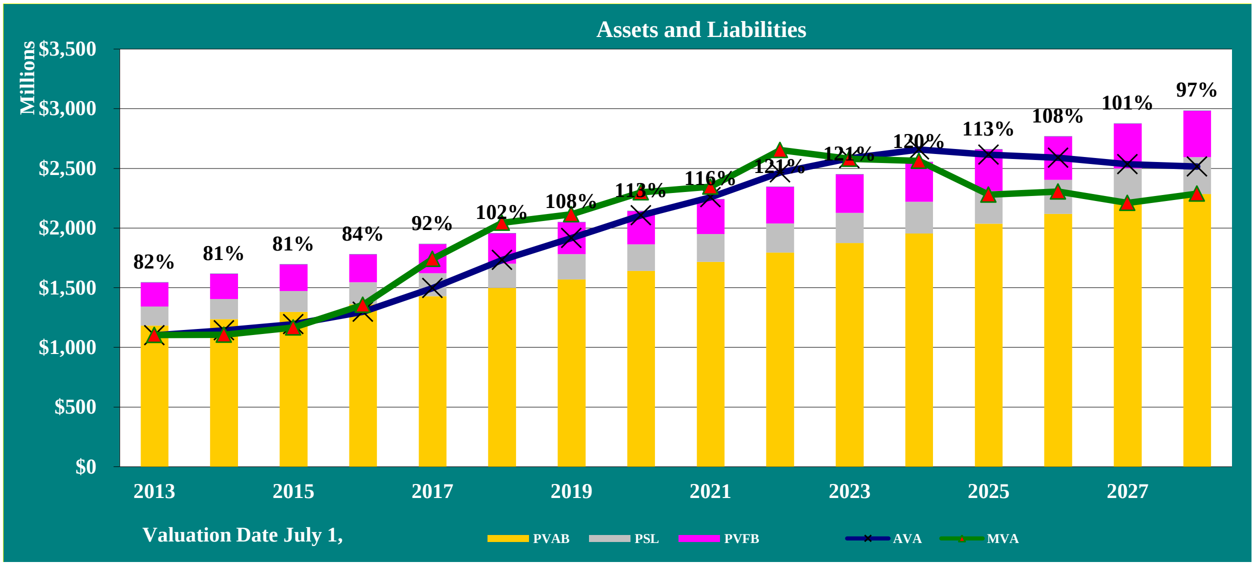



## SECTION I
## BOARD SUMMARY

Alternative Projection -- with average return of 7.5% in the period

Under this scenario, the corridor contribution rate increases until the System re-enters the corridor in 2017 and reaches full funding in 2018.

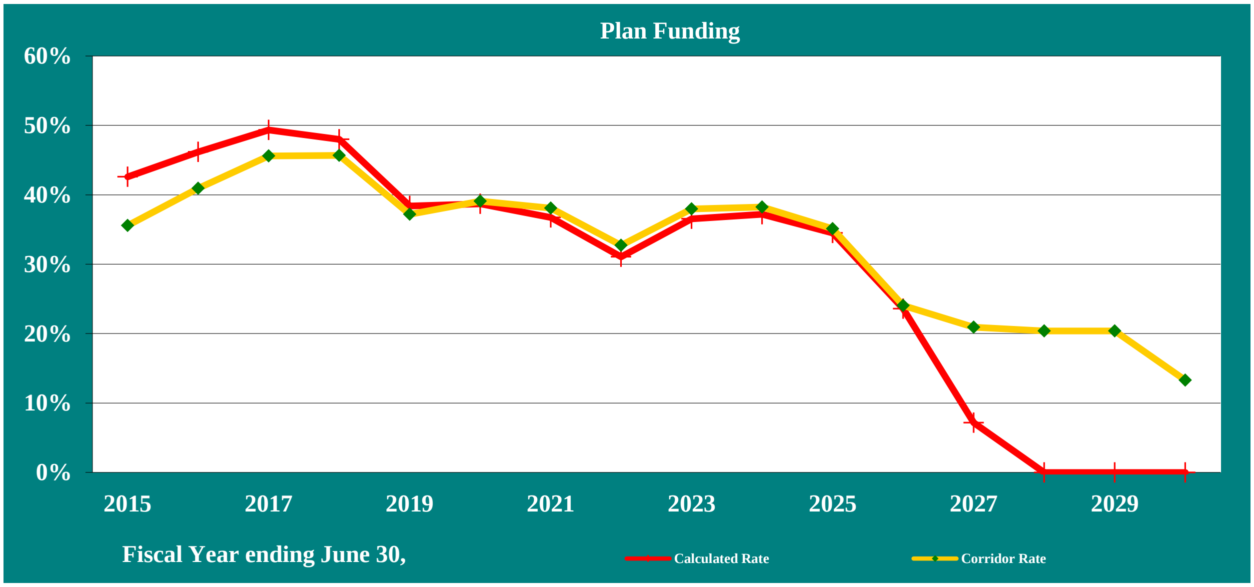


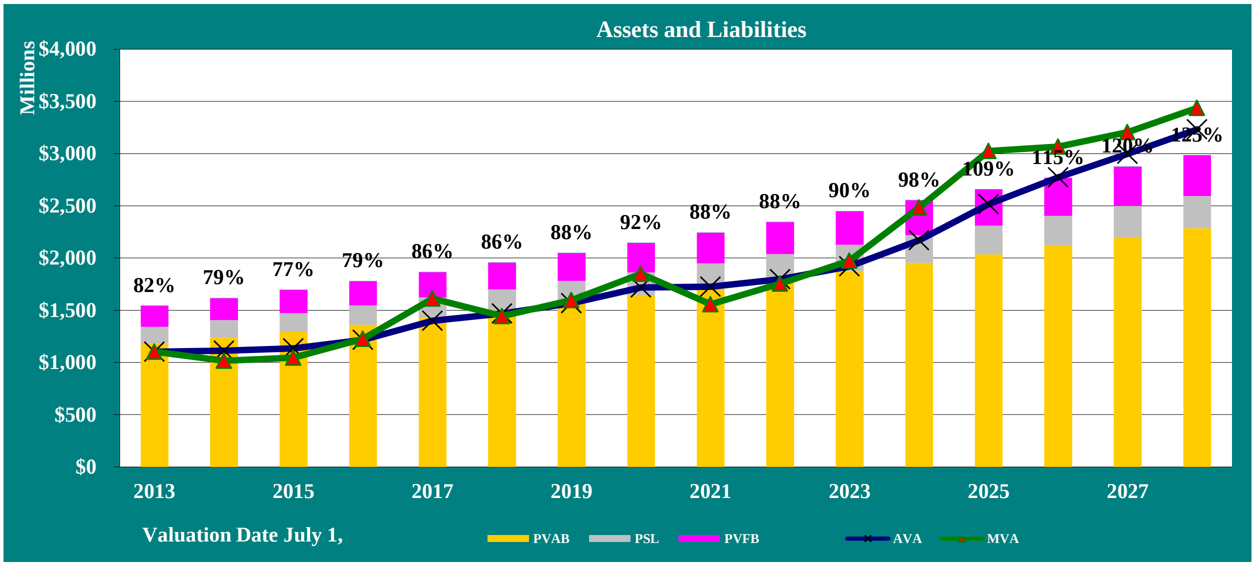



## SECTION I
## BOARD SUMMARY

<u>Alternative Projection – with average return of 10.0% in the period</u>

Under this scenario, the corridor contribution rate declines most years of the projection period until reaching the level of just paying normal cost by 2028.



## SECTION I
## BOARD SUMMARY

**Table I-2**
**Summary of Principal Plan Results**

| Valuation as of: | 7/1/2012 | 7/1/2013 | % Chg |
|---|---|---|---|
| **Participant Counts** | | | |
| Actives (excluding DROP) | 1,276 | 1,237 | -3.1% |
| DROPs | 73 | 89 | 21.9% |
| Terminated Vesteds | 33 | 33 | 0.0% |
| In Pay Status | 876 | 907 | 3.5% |
| Total | 2,258 | 2,266 | 0.4% |
| Annual Salaries of Active Members | $ 101,121,159 | $ 97,361,728 | -3.7% |
| Annual Retirement Allowances for Retired Members and Beneficiaries | $ 51,266,257 | $ 54,193,186 | 5.7% |
| **Assets and Liabilities** | | | |
| Actuarial Accrued Liability | $ 1,286,840,665 | $ 1,341,129,495 | 4.2% |
| Assets for Valuation Purposes | 1,035,444,171 | 1,101,474,728 | 6.4% |
| Unfunded Actuarial Liability | $ 251,396,494 | $ 239,654,767 | -4.7% |
| Funding Ratio | 80.5% | 82.1% | |
| Present Value of Accrued Benefits | $ 1,128,574,246 | $ 1,181,327,846 | 4.7% |
| Market Value of Assets | 1,017,451,230 | 1,102,522,083 | 8.4% |
| Unfunded Accrued Liability (not less than $0) | $ 111,123,016 | $ 78,805,763 | -29.1% |
| Accrued Benefit Funding Ratio | 90.2% | 93.3% | |
| **Contributions as a Percentage of Payroll** | **Fiscal Year 2014** | **Fiscal Year 2015** | |
| **GASB Method:** | | | |
| Normal Cost Contribution | 20.09% | 20.09% | |
| Unfunded Actuarial Liability Contribution | 22.41% | 22.19% | |
| Administrative Expense | 0.30% | 0.30% | |
| Total Contribution | 42.80% | 42.58% | |
| **Corridor Method:** | | | |
| Normal Cost Contribution | 20.09% | 20.09% | |
| Increase Due to Amortized Changes | 4.24% | 4.24% | |
| Amortization of Amount Outside Corridor | 8.09% | 7.19% | |
| Administrative Expense | 0.30% | 0.30% | |
| Corridor Method | 32.72% [1] | 31.82% [2] | |

[1] The actual contribution rate being paid by the County in FY 14 is 33.87%.

[2] Corridor Method based on amortization to 90% per current funding policy. Alternative rate calculations developed by amortizing to 93% is 35.55%.

# SECTION II
# ASSETS

Pension system assets play a key role in the financial operation of the System and in the decisions the Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely impact upon benefit levels, County contributions, and the ultimate security of participants' benefits.

In this section, we present detailed information on system assets including:

- **Disclosure** of system assets at July 1, 2012 and July 1, 2013;
- Statement of the **changes** in market values during the year;
- Development of the **actuarial value of assets**;
- An assessment of **investment performance**; and
- A projection of the System's expected **cash flows** for the next ten years.

## Disclosure

The market value of assets represents "snap-shot or cash-out" values which provide the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the marketplace. As a result, market values are usually not suitable for long-range planning.

The actuarial values are market values which have been smoothed; they are used for evaluating the System's ongoing liability to meet its obligations.

Current methods employed by this System set the actuarial value equal to the expected value plus 33-1/3% of the difference between the expected value of assets and the actual market value, where the expected value is equal to the prior year's actuarial value, rolled forward with actual contributions, benefit payments, and administrative expenses plus interest imputed at 7.5%.

## SECTION II
## ASSETS

**Table II-1**
**Statement of Assets at Market Value**

| | 7/1/2012 | 7/1/2013 |
|---|---|---|
| **Assets** | | |
| Equity in County's Pooled Cash, | | |
| Contributions Receivable and Other Assets | $ 4,251,763 | $ 3,385,754 |
| Accrued Interest and Dividends Receivable | 2,419,737 | 1,846,671 |
| Receivable from Sale of Investments | 4,715,244 | 5,947,383 |
| US Government Obligations | 39,567,050 | 46,047,990 |
| Asset-Backed Securities | 82,627,172 | 68,538,931 |
| Other Bonds and Notes | 86,664,584 | 60,081,461 |
| Common and Preferred Stock | 89,179,070 | 141,210,663 |
| Pooled and Mutual Funds | 690,370,126 | 753,804,866 |
| Short-Term Investments | 24,038,761 | 29,674,338 |
| Cash Collateral Received Under | | |
| Securities Lending Agreements | 5,439,154 | 8,621,799 |
| Total Assets | $ 1,029,272,661 | $ 1,119,159,856 |
| **Liabilities** | | |
| Payable for Collateral Received Under | | |
| Securities Lending Agreements | $ 5,439,154 | $ 8,621,799 |
| Payable for Purchase of Investments | 4,862,799 | 6,415,220 |
| Accounts Payable and Accrued Expenses | 1,519,478 | 1,600,754 |
| Total Liabilities | $ 11,821,431 | $ 16,637,773 |
| **Net Assets Available for Benefits** | **$ 1,017,451,230** | **$ 1,102,522,083** |

## SECTION II
## ASSETS

**Table II-2**
**Changes in Market Values**

| | | |
|---|---|---|
| **Value of Assets – July 1, 2012** | | **$ 1,017,451,230** |
| **Additions** | | |
| Contributions: | | |
| County Contributions | $ 34,011,347 | |
| Employee Contributions | 10,258,858 | |
| Total Contributions | | $ 44,270,205 |
| Investment Income: | | |
| Net Appreciation (Depreciation) in Fair Value of Investments | $ 78,529,347 | |
| Interest | 14,754,103 | |
| Dividends | 5,839,312 | |
| Total Investment Income | $ 99,122,762 | |
| Investment Activity Expenses: | | |
| Management Fees | $ (2,120,529) | |
| Custodian Fees | (69,244) | |
| Consulting Expense | (1,350) | |
| Allocated Administrative Expenses | (187,684) | |
| Total Investment Activity Expenses | $ (2,378,807) | |
| From Securities Lending Activities: | | |
| Securities Lending Income | $ 57,683 | |
| Securities Lending Expenses | | |
| Borrowers Rebates | 0 | |
| Management Fees | (18,560) | |
| Net Income from Securities Lending Activities | $ 39,123 | |
| Net Investment Income | | $ 96,783,078 |
| Total Additions | | $ 141,053,283 |
| **Deductions** | | |
| Annuity Benefits | $ (50,784,313) | |
| Disability Benefits | (1,360,565) | |
| Survivor Benefits | (3,121,586) | |
| Refunds and Other Expenses | (300,847) | |
| Administrative Expenses | (415,119) | |
| Total Deductions | | $ (55,982,430) |
| **Total** | | |
| Net Increase (Decrease) | | $ 85,070,853 |
| **Value of Assets – July 1, 2013** | | **$ 1,102,522,083** |

**SECTION II**
**ASSETS**

## Actuarial Value of Assets

The actuarial value of assets represents a "smoothed" value developed by the actuary to reduce, or eliminate, erratic results which could develop from short-term fluctuations in the market value of assets. For this System, the actuarial value has been calculated by adding 33⅓% of the difference between market value and expected value to the expected value. The following table illustrates the calculation of the actuarial value of assets for the July 1, 2013 valuation.

**Table II-3**
**Development of Actuarial Value of Assets**
**as of July 1, 2013**

| | | | |
|---|---|---|---|
| 1. | Actuarial Value of Assets at July 1, 2012 | **$** | **1,035,444,171** |
| 2. | Amount in (1) with Interest to July 1, 2013 | | 1,113,102,484 |
| 3. | County and Member Contributions for the Plan Year Ended June 30, 2013 | | 44,270,205 |
| 4. | Interest on Contributions Assuming Received Uniformly Throughout the Year to July 1, 2013 | | 1,660,133 |
| 5. | Disbursements from Trust Except Investment Expenses, July 1, 2012 Through June 30, 2013 | | (55,982,430) |
| 6. | Interest on Disbursements Assuming Payments Made Uniformly Throughout the Year to July 1, 2013 | | (2,099,342) |
| 7. | Expected Value of Asset at July 1, 2013 = (2) + (3) + (4) + (5) + (6) | $ | 1,100,951,050 |
| 8. | Market Value of Assets at July 1, 2013 | | 1,102,522,083 |
| 9. | Excess of (8) Over (7) | $ | 1,571,033 |
| 10. | Actuarial Value of Assets at July 1, 2013 = (7) + 33-1/3% of (9) | **$** | **1,101,474,728** |

*All interest adjustments are made using the 7½% per annum actuarial assumed interest rate.*

**SECTION II**
**ASSETS**

## Investment Performance

The market value of assets (MVA) returned 9.57% during 2013, which is more than the assumed 7.50% return. A return of 7.55% on the actuarial value of assets (AVA) is primarily the result of the asset smoothing method being utilized for the calculation of the actuarial value of assets. Since only 33⅓% of the gain or loss from the performance of the System is recognized in a given year, in periods of very good performance, the AVA can lag significantly behind the MVA. In a period of negative returns, the AVA does not decline as rapidly as the MVA.

**Table II-4**
**Annual Rates of Return**

| Year Ending June 30, | Market Value | Actuarial Value | Total Return Standard & Poor's 500 Index | Barclays Global Aggregate Index [1] |
|---|---|---|---|---|
| 1989 | 10.5% | 11.4% | 20.4% | 12.3% |
| 1990 | 11.8% | 11.2% | 16.4% | 7.1% |
| 1991 | 9.5% | 9.9% | 7.4% | 10.2% |
| 1992 | 12.2% | 10.0% | 13.5% | 14.2% |
| 1993 | 15.0% | 11.4% | 13.6% | 13.2% |
| 1994 | 3.4% | 7.6% | 1.3% | -1.5% |
| 1995 | 14.6% | 10.5% | 26.1% | 12.8% |
| 1996 | 16.1% | 19.2% [2] | 26.0% | 4.7% [3] |
| 1997 | 21.4% | 15.1% | 34.6% | 8.2% |
| 1998 | 17.3% | 8.1% | 30.2% | 10.5% |
| 1999 | 8.1% | 15.9% | 22.7% | 3.1% |
| 2000 | 7.7% | 12.7% | 7.3% | 4.6% |
| 2001 | -3.1% | 7.0% | -14.8% | 11.2% |
| 2002 | -5.1% | 3.0% | -18.0% | 8.6% |
| 2003 | 4.1% | 3.3% | 0.3% | 10.4% |
| 2004 | 15.5% | 7.0% | 19.1% | 0.3% |
| 2005 | 9.1% | 7.7% | 6.3% | 6.8% |
| 2006 | 9.5% | 8.3% | 8.6% | -0.8% |
| 2007 | 17.4% | 11.4% | 20.6% | 6.1% |
| 2008 | -6.0% | 5.2% | -13.1% | 7.1% |
| 2009 | -17.6% | -2.1% | -26.2% | 5.5% |
| 2010 | 20.5% | 3.9% | 14.4% | 9.5% |
| 2011 | 25.3% | 10.5% | 30.8% | 3.9% |
| 2012 | -0.7% | 6.6% | 5.4% | 7.5% |
| 2013 | 9.6% | 7.6% | 20.6% | -0.1% |

[1] Formerly the Lehman Global Aggregate Bond Index.
[2] The actuarial return in 1996 reflects the adjustment to a revised actuarial valuation method.
[3] Figures shown prior to 1997 are Shearson Lehman Government/Corporate Bond Index.

## SECTION II
## ASSETS

Expected benefit payments are projected for the closed group valued at July 1, 2013. Projecting any farther than ten years using a closed-group would not yield reliable predictions due to the omission of new hires.

Expected contributions are projected based on the current County contribution rate of 33.87% for FY 2014, and then using amortize to 93% rate for FY 2015, amortize to 94% for FY 2016 and so on increasing to 100%. This projection assumes no further gains or losses and a 3% annual increase in the total covered payroll, and models the anticipated impact of new hires coming in with altered plan provisions.

**Table II-5**
**Projection of System's Benefit Payments and County Contributions**

| Year Beginning July 1, | Expected Benefit Payments[1] | Expected County Contributions |
|---|---|---|
| 2013 | $ 66,604,000 | $ 33,467,000 |
| 2014 | 67,324,000 | 36,181,000 |
| 2015 | 67,634,000 | 38,326,000 |
| 2016 | 72,166,000 | 40,505,000 |
| 2017 | 75,887,000 | 42,720,000 |
| 2018 | 81,263,000 | 44,622,000 |
| 2019 | 86,095,000 | 46,926,000 |
| 2020 | 89,106,000 | 48,496,000 |
| 2021 | 94,026,000 | 49,244,000 |
| 2022 | 100,090,000 | 49,173,000 |

[1] Assumes assets in the inactive and suspense account are paid out in first year.

**SECTION III**
**LIABILITIES**

In this section, we present detailed information on system liabilities including:

- **Disclosure** of system liabilities at July 1, 2012 and July 1, 2013;
- Statement of **changes** in these liabilities during the year; and
- A **projection** of future liabilities.

## Disclosure

Several types of liabilities are calculated and presented in this report. Each type is distinguished by the people ultimately using the figures and the purpose for which they are using them.

- **Present Value of Benefits:** Used for analyzing the financial outlook of the System, this represents the amount of money needed today to fully pay off all future benefits and expenses of the System, assuming participants continue to accrue benefits.

- **Actuarial Accrued Liability:** Used for funding calculations and GASB disclosures, this liability is calculated taking the present value of benefits above and subtracting the present value of future member contributions and future employer normal costs under an acceptable actuarial funding method. This method is referred to as the **Entry Age Normal** funding method.

- **Present Value of Accrued Liabilities:** Used for communicating the current level of liabilities, this liability represents the total amount of money needed today to fully pay off the current accrued obligations of the System, assuming no future accruals of benefits. These liabilities are also required for accounting purposes (FASB ASC Topic 960) and used to assess whether the plan can meet its current benefit commitments.

The following table discloses each of these liabilities for the current and prior valuations. With respect to each disclosure, a subtraction of the appropriate value of system assets yields, for each respective type, a **net surplus** or an **unfunded liability**.

## SECTION III
## LIABILITIES

**Table III-1**
**Liabilities/Net (Surplus)/Unfunded**

| | July 1, 2012 | July 1, 2013 |
|---|---|---|
| **Present Value of Future Benefits** | | |
| Active Participant Benefits (excluding DROP) | $ 821,365,334 | $ 799,422,340 |
| DROP Participant Benefits | 92,791,904 | 115,685,867 |
| Retiree Benefits | 702,335,868 | 739,957,632 |
| Terminated Vested and Inactive Members | 3,511,289 | 3,662,481 |
| **Present Value of Benefits (PVB)** | **$ 1,620,004,395** | **$ 1,658,728,320** |
| | | |
| Market Value of Assets (MVA) | $ 1,017,451,230 | $ 1,102,522,083 |
| Future Employee Contributions | 108,065,639 | 103,016,976 |
| Future County Contributions | 494,487,526 | 453,189,261 |
| **Total Resources** | **$ 1,620,004,395** | **$ 1,658,728,320** |
| | | |
| **Actuarial Accrued Liability** | | |
| Present Value of Benefits (PVB) | $ 1,620,004,395 | $ 1,658,728,320 |
| Present Value of Future Normal Costs (PVFNC) | | |
| County Portion | 225,098,091 | 214,581,849 |
| Employee Portion | 108,065,639 | 103,016,976 |
| **Actuarial Accrued Liability (AAL = PVB – PVFNC)** | **$ 1,286,840,665** | **$ 1,341,129,495** |
| Actuarial Value of Assets (AVA) | 1,035,444,171 | 1,101,474,728 |
| **Net (Surplus)/Unfunded (AAL – AVA)** | **$ 251,396,494** | **$ 239,654,767** |
| | | |
| Present Value of Accrued Benefits | | |
| Present Value of Benefits (PVB) | $ 1,620,004,395 | $ 1,658,728,320 |
| Present Value of Future Benefit Accruals (PVFBA) | 491,430,149 | 477,400,474 |
| **Present Value of Accrued Benefits (PVAB = PVB – PVFBA)** | **$ 1,128,574,246** | **$ 1,181,327,846** |
| Market Value of Assets (MVA) | 1,017,451,230 | 1,102,522,083 |
| **Net Unfunded, not less than $0 (PVAB – MVA)** | **$ 111,123,016** | **$ 78,805,763** |

**SECTION III**
**LIABILITIES**

## Changes in Liabilities

Each of the liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New hires since the last valuation
- Benefits accrued since the last valuation
- Plan amendments increasing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial or investment assumptions
- A change in the actuarial funding method

Unfunded liabilities will change because of all of the above and also due to changes in system assets resulting from:

- County contributions less than the full actuarial contribution
- Investment earnings different than expected
- A change in the method used to measure system assets

In each valuation, we report on those elements of change which are of particular significance, potentially affecting the long-term financial outlook of the System. Below we present key changes in liabilities since the last valuation.

**Table III-2**

| | Present Value of Benefits | Actuarial Accrued Liability | Present Value of Accrued Benefits |
|---|---|---|---|
| Liabilities 7/1/2012 | $ 1,620,004,395 | $ 1,286,840,665 | $ 1,128,574,246 |
| Liabilities 7/1/2013 | 1,658,728,320 | 1,341,129,495 | 1,181,327,846 |
| Liability Increase (Decrease) | $ 38,723,925 | $ 54,288,830 | $ 52,753,600 |
| Change Due to: | | | |
| Plan Amendment and Ad Hoc COLAs | $ 0 | $ 0 | $ 0 |
| Actuarial (Gain)/Loss | *Not Calculated* | (17,282,544) | *Not Calculated* |
| Benefits Accumulated and Other Sources | 38,723,925 | 71,571,374 | 52,753,600 |

**SECTION IV**
**CONTRIBUTIONS**

In the process of evaluating the financial condition of any pension system, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions is needed to properly maintain the funding status of the system. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that is both stable and predictable.

For this System, the funding method employed is the **Entry Age Actuarial Cost Method**. Under this method, there are three components to the total contribution: the **normal cost rate**, the **unfunded actuarial liability rate** (UAL rate), and the **administrative expense rate**. The normal cost rate is determined in the following steps. First, an individual normal cost rate is determined by taking the value, as of entry age into the system, of each member's projected future benefits. This value is then divided by the value, also at entry age, of the member's expected future salary. Second, the individual normal cost rate for each member is weighted by the present value of future pay at current age to obtain an average total normal cost rate for the system. Finally, the total normal cost rate is reduced by the average member contribution rate to produce the County's normal cost rate.

## Actuarially Determined Rate (for GASB Disclosure)

Effective with the 2001 valuation, the normal cost rate was frozen until the System is amended or there is a significant change in assumptions. The net impact on the normal cost rate is an increase of 3.09% of payroll. The changes are summarized in the following chart.

**Table IV-1**

| Changes Since 2001 | Impact on Normal Cost |
|---|---|
| 2005 Implementation of DROP | + 0.18% |
| 2005 Assumption Changes | - 0.18 |
| 2007 Change member contribution rate to 11% | + 0.89 |
| 2007 Remove 30 year service cap on benefits | + 0.04 |
| 2008 Change member contribution rate to 10% | + 0.89 |
| 2010 Assumption Changes | + 1.27 |
| Total Increase | + 3.09% |

The UAL rate is the level percent of member payroll which, when applied to each year's payroll, is sufficient to amortize the unfunded actuarial liability (UAL) over a 15-year period. This is essentially developing the UAL rate "fresh-starting" each year.

The assumed administrative expense rate is 0.30% of payroll. This rate, when applied to payroll, is intended to provide an allowance above the cost of funding the benefits to pay for the expense of operating the System. The table on the next page presents and compares the actuarially determined contributions for the System for this valuation and the prior one.

**SECTION IV**
**CONTRIBUTIONS**

**Table IV-2**
**Actuarially Determined Rate (For GASB Disclosure)**

| | July 1, 2012 | July 1, 2013 |
|---|---|---|
| Normal Cost Rate | 20.09% | 20.09% |
| UAL Rate | 22.41% | 22.19% |
| Expense Rate | 0.30% | 0.30% |
| Total County Rate | 42.80% | 42.58% |

## Budgeted Rate (Based on Corridor Method)

The County's total contribution rate is equal to the normal cost rate plus rate changes due to amendments passed or assumption changes adopted since July 1, 2001 plus the expense rate as long as the System's actuarial funded status remains within a corridor of 90% to 120%. The normal cost rate and actuarial accrued liability will continue to be measured using the entry age funding method. If the funded status falls outside the corridor, a credit (if above 120%) or charge (if below 90%) will be established based on a 15-year amortization equal to the amount necessary to re-enter the corridor. Once the funded status is within the corridor, the contribution rate will return to normal cost rate plus expense rate, plus amortization of post-2001 changes, plus expense rate.

**Table IV-3**

| Changes Since 2001 | Impact on UAL Rate |
|---|---|
| 2002 ad-hoc COLA | + 0.32% |
| 2004 ad-hoc COLA | + 0.48 |
| 2005 Implementation of DROP | + 0.16 |
| 2005 Assumption Changes | + 0.83 |
| 2005 ad-hoc COLA | + 0.46 |
| 2006 ad-hoc COLA | + 0.45 |
| 2007 ad-hoc COLA | + 0.45 |
| 2007 Remove 30 year service cap on benefits | + 0.07 |
| 2008 ad-hoc COLA | + 0.50 |
| 2010 Assumption Changes | + 0.52 |
| Total Increase | + 4.24% |

## SECTION IV
## CONTRIBUTIONS

The table below presents and compares the budgeted rate for the System for this valuation and the prior one. In both cases, the amortization follows the corridor method amortization to 90%.

**Table IV-4**
**Actuarially Determined Rate (for Corridor Contribution)**

| **Valuation Date**<br>**Fiscal Year** | **July 1, 2012**<br>**2014** | **July 1, 2013**<br>**2015** |
|---|---|---|
| Normal Cost Rate | 20.09% | 20.09% |
| UAL Rate | 4.24% | 4.24% |
| Amortization of Amount Outside Corridor | 8.09% | 7.19% |
| Expense Rate | 0.30% | 0.30% |
| Total County Rate | 32.72% * | 31.82%** |

* The actual contribution rate being paid by the County in FY 14 is 33.87%.
** The anticipated contribution rate to be paid by the County in FY 15 is 35.55%.

## SECTION IV
## CONTRIBUTIONS

In the table below, we develop the actuarially determined rate, used in GASB disclosures and the corridor contribution rate to be made by the County.

**Table IV-5**
**Development of Actuarially Determined Contribution Rate**

| | July 1, 2012 (for FY 2014) | July 1, 2013 (for FY 2015) |
|---|---|---|
| **1. Present Value of Future Benefits** | | |
| a. Active Employees | $ 821,365,334 | $ 799,422,340 |
| b. DROP | 92,791,904 | 115,685,867 |
| c. Retired Members | 702,335,868 | 739,957,632 |
| d. Vested Terminated and Inactive Members | 3,511,289 | 3,662,481 |
| e. Total Present Value | $1,620,004,395 | $1,658,728,320 |
| **2. Present Value of Future Normal Costs** | | |
| a. County Portion | $ 225,098,091 | $ 214,581,849 |
| b. Employee Portion | 108,065,639 | 103,016,976 |
| c. Total Present Value | $ 333,163,730 | $ 317,598,825 |
| **3. Present Value of Future Salaries for Current Active Members** | $1,120,448,438 | $1,068,102,780 |
| **4. Actuarial Value of Assets** | $1,035,444,171 | $1,101,474,728 |
| **5. Actuarial Accrued Liability (1) – (2)** | $1,286,840,665 | $1,341,129,495 |
| **6. Unfunded Actuarial Liability (5) – (4)** | $ 251,396,494 | $ 239,654,767 |
| **7. Active Member Payroll** | $ 101,121,159 | $ 97,361,728 |
| **8. Unfunded Liability Amortization Factor** | 11.0918 | 11.0918 |
| **9. County Contribution Results (GASB)** | | |
| a. Normal Cost Rate | 20.09% | 20.09% |
| b. Fresh Start Unfunded Liability Amortization (6 ÷ 8 ÷ 7) | 22.41% | 22.19% |
| c. Administrative Expense Rate | 0.30% | 0.30% |
| d. Total County Contribution Rate June 30 | 42.80% | 42.58% |

## SECTION IV
## CONTRIBUTIONS

**Table IV-6**
**Development of Corridor Contribution Rate**

| | July 1, 2012 (for FY 2014) | July 1, 2013 (for FY 2015) |
|---|---|---|
| **1. Present Value of Future Benefits** | | |
| a. Active Employees | $ 821,365,334 | $ 799,422,340 |
| b. DROP | 92,791,904 | 115,685,867 |
| c. Retired Members | 702,335,868 | 739,957,632 |
| d. Vested Terminated and Inactive Members | 3,511,289 | 3,662,481 |
| e. Total Present Value | $1,620,004,395 | $1,658,728,320 |
| **2. Present Value of Future Normal Costs** | | |
| a. County Portion | $ 225,098,091 | $ 214,581,849 |
| b. Employee Portion | 108,065,639 | 103,016,976 |
| c. Total Present Value | $ 333,163,730 | $ 317,598,825 |
| **3. Actuarial Accrued Liability (1) – (2)** | $1,286,840,665 | $1,341,129,495 |
| **4. Actuarial Value of Assets for Corridor Purposes** | | |
| a. Actuarial Assets | $1,035,444,171 | $1,101,474,728 |
| b. Outstanding Balance of Plan and Assumption Changes | 31,920,280 | 27,851,140 |
| c. Adjusted Assets (a) + (b) | $1,067,364,451 | $1,129,325,868 |
| **5. Funding Ratio for Corridor Test** | 82.9% | 84.2% |
| **6. Liability to be Amortized if outside Corridor** | | |
| a. 90% x (3) - (4)(c) | $ 90,792,147 | $ 77,690,677 |
| b. (4)(c) - 120% x (3) | 0 | 0 |
| **7. Active Member Payroll** | $ 101,121,159 | $ 97,361,728 |
| **8. Unfunded Liability Amortization Factor** | 11.0918 | 11.0918 |
| **9. Amortization as a % of Payroll (6)/(7)/(8)** | 8.09% | 7.19% |
| **10. County Contribution Results (Corridor)** | | |
| a. Normal Cost Rate | 20.09% | 20.09% |
| b. Administrative Expense Rate | 0.30% | 0.30% |
| c. Plan Change Amortizations | 4.24% | 4.24% |
| d. Amortization Outside Corridor (9) | 8.09% | 7.19% |
| e. Total County Contribution Rate June 30[1] | 32.72% | 31.82% |

[1] Alternative rate calculations developed by amortizing to 93% for FY 2015 is a County Rate of 35.55%.

## SECTION V
## ACCOUNTING STATEMENT INFORMATION

ASC Topic 960 of the Financial Accounting Standards Board (FASB) requires the System to disclose certain information regarding its funded status. Statement Number 25 of the Governmental Accounting Standards Board (GASB) establishes standards for disclosure of pension information by public employee retirement systems (PERS) and governmental employers in notes to financial statements and supplementary information.

The FASB ASC Topic 960 disclosures provide a quasi “snap shot” view of how the System’s assets compare to its liabilities if contributions stopped and accrued benefit claims had to be satisfied. However, due to potential legal requirements and the possibility that alternative interest rates would have to be used to determine the liabilities, these values may not be a good indication of the amount of money it would take to buy the benefits for all members if the System were to terminate.

The GASB-25 actuarial accrued liability is the same as the actuarial liability amount calculated for funding purposes.

Both the present value of accrued benefits (FASB ASC Topic 960) and the actuarial accrued liability (GASB-25) are determined assuming that the System is on-going and participants continue to terminate employment, retire, etc., in accordance with the actuarial assumptions. Liabilities are discounted at the assumed valuation interest rate of 7.5% per annum.

FASB ASC Topic 960 specifies that a comparison of the present value of accrued (accumulated) benefits with the market value of the assets as of the valuation date must be provided. GASB Statement Number 25 requires the actuarial accrued liability be compared with the actuarial value of assets for funding purposes. The relevant amounts as of July 1, 2012 and July 1, 2013 are exhibited in Table V-1. Finally, Table V-2 reconciles the FASB ASC Topic 960 liabilities determined as of the prior valuation, July 1, 2012, to the liabilities as of July 1, 2013.

Tables V-3 through V-5 are exhibits to be used with the System’s CAFR report. Table V-3 is the Notes to Required Supplementary Information, Table V-4 is a history of gains and losses in Accrued Liability, and Table V-5 is the Solvency Test which shows the portion of Accrued Liability covered by Assets.

## SECTION V
## ACCOUNTING STATEMENT INFORMATION

**Table V-1**
**Accounting Statement Information**

| | July 1, 2012 | July 1, 2013 |
|---|---|---|
| **A. FASB ASC Topic 960 Basis** | | |
| 1. Present Value of Benefits Accrued and Vested to Date | | |
| a. Members Currently Receiving Payments | $ 702,335,868 | $ 739,957,632 |
| b. Vested Terminated and Inactive Members | 3,511,289 | 3,662,481 |
| c. DROP | 92,791,904 | 115,685,867 |
| d. Active Members | 323,099,395 | 317,536,305 |
| e. Total PVVB | $1,121,738,456 | $1,176,842,285 |
| 2. Present Value of Non-Vested Accrued Benefits for Active Members | 6,835,790 | 4,485,561 |
| 3. Total Present Value of Accrued Benefits | $1,128,574,246 | $1,181,327,846 |
| 4. Assets at Market Value | 1,017,451,230 | 1,102,522,083 |
| 5. Unfunded Present Value of Accrued Benefits, But Not Less Than Zero | $ 111,123,016 | $ 78,805,763 |
| 6. Ratio of Assets to Value of Benefits (4) / (3) | 90.2% | 93.3% |
| **B. GASB No. 25 Basis** | | |
| 1. Actuarial Liabilities | | |
| a. Members Currently Receiving Payments | $ 702,335,868 | $ 739,957,632 |
| b. Vested Deferred and Inactive Status Members | 3,511,289 | 3,662,481 |
| c. DROP | 92,791,904 | 115,685,867 |
| d. Active Members | 488,201,604 | 481,823,515 |
| e. Total | $1,286,840,665 | $1,341,129,495 |
| 2. Actuarial Value of Assets | 1,035,444,171 | 1,101,474,728 |
| 3. Unfunded Actuarial Liability | $ 251,396,494 | $ 239,654,767 |
| 4. Ratio of Actuarial Value of Assets to Actuarial Liability | 80.5% | 82.1% |

## SECTION V
## ACCOUNTING STATEMENT INFORMATION

**Table V-2**
**Statement of Changes in Total Actuarial Present Value of All Accrued Benefits**

| | Accumulated Benefit Obligation (FASB ASC Topic 960) |
|---|---|
| Actuarial Present Value of Accrued Benefits as of July 1, 2012 | $ 1,128,574,246 |
| | |
| Increase (Decrease) During Years Attributable to: | |
| Passage of Time | $ 82,559,294 |
| Benefits Paid – FY 2013 | (55,567,311) |
| Plan Amendment (Including Ad-Hoc COLA) | 0 |
| Benefits Accrued, Other Gains/Losses | 25,761,617 |
| Net Increase (Decrease) | $ 52,753,600 |
| | |
| Actuarial Present Value of Accrued Benefits as of July 1, 2013 | $ 1,181,327,846 |

## SECTION V
## ACCOUNTING STATEMENT INFORMATION

### Table V-3
### Note to Required Supplementary Information

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

| | |
|---|---|
| Valuation date | July 1, 2013 |
| Actuarial cost method | Entry age |
| Amortization method | Level percent open |
| Remaining amortization period | 15 years |
| Asset valuation method | 3-year smoothed market |
| Actuarial assumptions: | |
| Investment rate of return* | 7.5% |
| Projected salary increases* | 4.8% - 11.0% |
| Cost-of-living adjustments | 2.75% |
| *Includes inflation at | 3.0% |

The actuarial assumptions used have been recommended by the actuary and adopted by the System’s Board of Trustees based on the most recent review of the System’s experience, completed in 2011.

The rate of employer contributions to the System is composed of the normal cost, amortization of the unfunded actuarial accrued liability and an allowance for administrative expenses. The normal cost is a level percent of payroll cost which, along with the member contributions, will pay for projected benefits at retirement for the average plan participant. The actuarial accrued liability is that portion of the present value of projected benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and the funds accumulated as of the same date is the unfunded actuarial accrued liability. The allowance for administrative expenses is based upon the System’s actual administrative expenses.

## SECTION V
## ACCOUNTING STATEMENT INFORMATION

**Table V-4**
**Analysis of Financial Experience**
**Gains and Losses in Accrued Liability During Years Ended June 30**
**Resulting from Differences Between Assumed Experience and Actual Experience**

| | *Gain (or Loss) for Year ending June 30,* | | | | | |
|---|---|---|---|---|---|---|
| **Type of Activity** | **2008** | **2009** | **2010** | **2011** | **2012** | **2013** |
| Investment Income | $ (19,958,077) | $ (86,460,572) | $ (31,755,165) | $ 26,496,140 | $ (8,996,470) | $ 523,678 |
| Combined Liability Experience | 4,139,287 | 17,649,316 | 3,313,576 | (12,495,024) | 1,919,058 | 17,282,544 |
| Gain (or Loss) During Year from Financial Experience | $ (15,818,790) | $ (68,811,256) | $ (28,441,589) | $ 14,001,116 | $ (7,077,412) | $ 17,806,222 |
| Non-Recurring Items | (5,902,768) | 0 | 0 | (5,795,987) | 0 | 0 |
| Composite Gain (or Loss) During Year | **$ (21,721,558)** | **$ (68,811,256)** | **$ (28,441,589)** | **$ 8,205,129** | **$ (7,077,412)** | **$ 17,806,222** |

**Table V-5**
**Solvency Test**
**Aggregate Accrued Liabilities For**

| **Valuation Date July 1,** | **(1) Active Member Contributions** | **(2) Retirees Vested Terms, Beneficiaries & DROP** | **(3) Active Members (Employer Financed Portion)** | **Reported Assets** | **Portion of Accrued Liabilities by Reported Assets (1)** | **(2)** | **(3)** |
|---|---|---|---|---|---|---|---|
| 2008 | $ 92,223,155 | $ 623,812,098 | $ 315,297,859 | $ 908,077,197 | 100% | 100% | 61% |
| 2009 | 96,351,833 | 658,492,487 | 321,194,627 | 879,543,429 | 100% | 100% | 39% |
| 2010 | 100,709,756 | 695,041,990 | 339,263,552 | 899,543,387 | 100% | 100% | 31% |
| 2011 | 104,188,027 | 732,172,476 | 383,248,604 | 982,153,681 | 100% | 100% | 38% |
| 2012 | 107,411,328 | 798,639,061 | 380,790,276 | 1,035,444,171 | 100% | 100% | 34% |
| 2013 | 107,211,514 | 859,305,980 | 374,612,001 | 1,101,474,728 | 100% | 100% | 36% |

## APPENDIX A
## MEMBERSHIP INFORMATION

The data for this valuation was provided electronically by the Fairfax County Retirement System staff. Cheiron did not perform a formal audit on the data. However, we did perform checks of the data for reasonable and consistency in accordance with Actuarial Standards of Practice Number 23 Data Quality. The active data was collected as of January 1, 2013 and the inactive data was collected as of July 1, 2013.

Active pay information is adjusted to project the pay expected to be earned from July 1, 2013 through June 30, 2014. The annual payroll was provided as of December 31, 2012 and adjusted to July 1, 2013, which included annualizing the 2.18% increase from July 1, 2012.

For inactive participants given with a Joint and Survivor form of benefit and no continuation percentage provided, a survivor percentage of 100% is assumed.

## APPENDIX A
## MEMBERSHIP INFORMATION

### Summary of Membership Data as of July 1, 2013

| Active Members* | | | |
|---|---|---|---|
| | Count | Annual Salary Rates | Average Annual Salary |
| Employed Prior to July 1, 1981 | 4 | $ 552,142 | $ 138,035 |
| Employed on or After July 1, 1981 | 1,233 | 96,809,586 | 78,515 |
| Total | 1,237 | $ 97,361,728 | $ 78,708 |
| Average Age | 38.9 | | |
| Average Service | 12.6 | | |

* Excludes DROP participants.

| Inactive Members and DROP Participants | | | |
|---|---|---|---|
| | Count | Total Annual Benefit | Average Monthly Benefit |
| Service Retirement | 764 | $ 49,755,126 | $ 5,427 |
| Service-Connected Disability | 30 | 1,200,102 | 3,334 |
| Ordinary Disability | 6 | 132,773 | 1,844 |
| Beneficiaries | 107 | 3,105,185 | 2,418 |
| Total/Average in Payment Status | 907 | $ 54,193,186 | $ 4,979 |
| | | | |
| DROP | 89 | $ 6,471,708 | $ 6,060 |
| Vested Former Members | 33 | 526,014 | 1,328 |

# APPENDIX A
# MEMBERSHIP INFORMATION

**Data Reconciliation from July 1, 2012 to July 1, 2013**

| | Active | DROP | Terminated Vested | Retired | Service-Connected Disability | Ordinary Disability | Widow | Beneficiary | Child | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **Participant count as of July 1, 2012** | **1,276** | **73** | **33** | **735** | **30** | **7** | **77** | **20** | 7 | **2,258** |
| New Hires | 31 | | | | | | | | | **31** |
| Terminated Vested | (1) | | 1 | | | | | | | **0** |
| DROP | (39) | 39 | | | | | | | | **0** |
| Retired | (16) | (23) | | 39 | | | | | | **0** |
| Deceased with beneficiary | | | | (8) | (1) | | 8 | 2 | 1 | **2** |
| Deceased without beneficiary | | | | (2) | | (1) | (3) | (3) | | **(9)** |
| Benefits Expired | | | | | | | | | (2) | **(2)** |
| Ordinary Disability | | | | | | | | | | **0** |
| Service-Connected Disability | (1) | | | | 1 | | | | | **0** |
| Terminated Not Vested | (13) | | | | | | | | | **(13)** |
| Corrections | | | (1) | | | | | | | **(1)** |
| Change | (39) | 16 | 0 | 29 | 0 | (1) | 5 | (1) | (1) | **8** |
| **Participant count as of July 1, 2013** | **1,237** | **89** | **33** | **764** | **30** | **6** | **82** | **19** | **6** | **2,266** |

# APPENDIX A
# MEMBERSHIP INFORMATION

## Distribution of Active Participants - - Total

*COUNTS BY AGE/SERVICE*

| | Service | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Under 1 | 1 to 4 | 5 to 9 | 10 to 14 | 15 to 19 | 20 to 24 | 25 to 29 | 30 & Up | Total |
| Under 25 | 11 | 20 | 2 | 0 | 0 | 0 | 0 | 0 | 33 |
| 25 to 29 | 10 | 56 | 86 | 0 | 0 | 0 | 0 | 0 | 152 |
| 30 to 34 | 1 | 21 | 136 | 62 | 0 | 0 | 0 | 0 | 220 |
| 35 to 39 | 3 | 14 | 55 | 151 | 38 | 0 | 0 | 0 | 261 |
| 40 to 44 | 0 | 4 | 28 | 95 | 125 | 39 | 0 | 0 | 291 |
| 45 to 49 | 0 | 2 | 20 | 23 | 45 | 95 | 12 | 0 | 197 |
| 50 to 54 | 0 | 4 | 8 | 3 | 12 | 17 | 12 | 2 | 58 |
| 55 to 59 | 0 | 1 | 1 | 2 | 5 | 7 | 2 | 4 | 22 |
| 60 to 64 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| 65 & up | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Total | 25 | 122 | 337 | 338 | 225 | 158 | 26 | 6 | 1,237 |

*TOTAL SALARY BY AGE/SERVICE*

| | Service | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Under 1 | 1 to 4 | 5 to 9 | 10 to 14 | 15 to 19 | 20 to 24 | 25 to 29 | 30 & Up | Total |
| Under 25 | $ 661,276 | $ 1,059,505 | $ 115,622 | $ 0 | $ 0 | $ 0 | $ 0 | $ 0 | $ 1,836,403 |
| 25 to 29 | 649,891 | 3,300,932 | 5,707,531 | 0 | 0 | 0 | 0 | 0 | 9,658,354 |
| 30 to 34 | 68,659 | 1,242,573 | 9,700,895 | 4,853,139 | 0 | 0 | 0 | 0 | 15,865,266 |
| 35 to 39 | 202,452 | 869,010 | 4,101,280 | 11,956,071 | 3,206,305 | 0 | 0 | 0 | 20,335,118 |
| 40 to 44 | 0 | 252,615 | 2,122,275 | 7,500,128 | 10,912,019 | 3,752,314 | 0 | 0 | 24,539,351 |
| 45 to 49 | 0 | 120,010 | 1,500,353 | 1,829,355 | 3,888,125 | 9,094,967 | 1,123,237 | 0 | 17,556,047 |
| 50 to 54 | 0 | 253,860 | 581,492 | 226,797 | 1,028,555 | 1,666,923 | 1,215,798 | 253,221 | 5,226,646 |
| 55 to 59 | 0 | 64,258 | 77,558 | 158,437 | 423,535 | 656,567 | 182,180 | 552,142 | 2,114,677 |
| 60 to 64 | 0 | 0 | 77,911 | 75,781 | 0 | 0 | 0 | 0 | 153,692 |
| 65 & up | 0 | 0 | 0 | 76,174 | 0 | 0 | 0 | 0 | 76,174 |
| Total | $ 1,582,278 | $ 7,162,763 | $ 23,984,917 | $ 26,675,882 | $ 19,458,539 | $ 15,170,771 | $ 2,521,215 | $ 805,363 | $ 97,361,728 |

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

## A. Long-Term Assumptions Used to Determine System Costs and Liabilities

### 1. Demographic Assumptions

#### a. Healthy Mortality

| Annual Deaths Per 10,000 Members<br>RP-2000 Mortality Projected to 2015* | | |
|---|---|---|
| **Age** | **Male** | **Female** |
| 20 | 3 | 2 |
| 25 | 3 | 2 |
| 30 | 4 | 2 |
| 35 | 7 | 4 |
| 40 | 10 | 6 |
| 45 | 12 | 9 |
| 50 | 16 | 13 |
| 55 | 27 | 24 |
| 60 | 53 | 47 |
| 65 | 103 | 90 |
| 70 | 177 | 155 |
| 75 | 306 | 249 |
| 80 | 554 | 413 |
| 85 | 997 | 708 |
| 90 | 1,727 | 1,259 |
| 95 | 2,596 | 1,888 |
| 100 | 3,394 | 2,339 |
| 105 | 3,979 | 2,931 |

* 20% of deaths are assumed to be service-connected.

#### b. Disabled Mortality

| Annual Deaths Per 10,000 Disabled Members<br>RP-2000 Mortality Project to 2015<br>with Ages Set Forward Five Years | | |
|---|---|---|
| **Age** | **Male** | **Female** |
| 40 | 12 | 9 |
| 45 | 16 | 13 |
| 50 | 27 | 24 |
| 55 | 53 | 47 |
| 60 | 103 | 90 |
| 65 | 177 | 155 |
| 70 | 306 | 249 |
| 75 | 554 | 413 |
| 80 | 997 | 708 |

## APPENDIX B
## ACTUARIAL ASSUMPTIONS AND METHODS

### c. Termination of Employment (Prior to Normal Retirement Eligibility)

| Annual Terminations Per 1,000 Members | |
|---|---|
| **Years of Service** | **Terminations** |
| 0 | 70 |
| 1 | 40 |
| 2 | 45 |
| 3 | 50 |
| 4 | 40 |
| 5 | 30 |
| 6 | 20 |
| 7 | 15 |
| 8 | 14 |
| 9 | 13 |
| 10 | 12 |
| 11 | 11 |
| 12 | 10 |
| 13 | 10 |
| 14 | 10 |
| 15 | 8 |
| 16 | 6 |
| 17 | 4 |
| 18 | 2 |
| 19 | 2 |
| 20 or more | 2 |

It is assumed that members who terminated before normal or early retirement age elect to receive a refund of contributions instead of vested benefits.

# APPENDIX B
# ACTUARIAL ASSUMPTIONS AND METHODS

## d. Disability

| Annual Disabilities Per 1,000 Members* | |
|---|---|
| **Age** | **Male and Female** |
| 20 | 2 |
| 25 | 2 |
| 30 | 2 |
| 35 | 2 |
| 40 | 2 |
| 45 | 4 |
| 50 | 6 |
| 55 | 6 |
| 60 | 6 |

* 70% of disabilities are assumed to be service-connected.
Of these, 100% are assumed to receive Workers' Compensation benefits.

## e. Retirement

| Probability of Retirement* | | |
|---|---|---|
| **Years of Service** | **Hired Pre - 7/1/81** | **Hired Post - 7/1/81** |
| 20 | 40% | N/A |
| 21 | 40 | N/A |
| 22 | 40 | N/A |
| 23 | 40 | N/A |
| 24 | 40 | N/A |
| 25 | 40 | 40% |
| 26 | 40 | 40 |
| 27 | 40 | 40 |
| 28 | 40 | 40 |
| 29 | 40 | 40 |
| 30 | 40 | 40 |
| 31+ | 100 | 100 |

* 50% are assumed to DROP.

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

### f. Merit/Seniority Salary Increase (in addition to across-the-board increase)

| Years of Service* | Merit/Seniority Increase |
|---|---|
| 0 | 8.0% |
| 5 | 4.3 |
| 10 | 1.0 |
| 15 | 3.0 |
| 20 | 1.8 |
| 25 | 1.8 |
| 30 | 1.8 |

*There is a spike of 3.5% at 19 years of service.

### g. Family Composition

For purposes of valuing the pre-retirement death benefit, an assumption concerning how many employees are married is needed. The assumption used in this valuation is that 80% of active employees are married at death and that the female spouse is five years younger than the male spouse. In addition, each married employee is assumed to have two children, 22 and 24 years younger than the employee.

### h. Sick Leave Credit

Unused sick leave balances as reported for each active member will be used as the unused sick leave balance throughout the remaining active period.

## 2. Economic Assumptions

| | | |
|---|---|---|
| a. | Rate of Investment Return: | 7.50% |
| b. | Rate of General Wage Increase: | 3.00% |
| c. | Rate of Increase in Cost of Living: | 2.75% * |
| d. | Rate of Increase in Total Payroll (for Amortization): | 3.00% |
| e. | Administrative Expenses as a Percentage of Payroll: | 0.30% |

* Benefit increases are limited to 4% per year.

## 3. Changes since Last Valuation

None.

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

## B. Actuarial Methods

### 1. Funding Method

The funding method used for GASB disclosure purposes is the "aggregate accrual modification of the Entry Age Normal Cost method." Under this method, the employer contribution has three components: the normal cost, the payment toward the unfunded actuarial liability, and the expense rate.

The normal cost is a level percent of pay cost which, along with the member contributions, will pay for projected benefits at retirement for each plan participant. The level percent developed is called the normal cost rate, and the product of that rate and payroll is the normal cost.

The actuarial liability is that portion of the present value of projected benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and funds accumulated as of the same date is referred to as the unfunded actuarial liability.

The expense rate is added to cover the System's administrative expenses.

The employer contributions are calculated using the same basic actuarial method (EAN). However, in order to produce a more level contribution rate, the System has adopted a Corridor Funding Method.

Under the Corridor Funding Method, the employer's total contribution rate is equal to the normal cost rate, plus rate changes due to assumption changes or amendments passed since July 1, 2001 plus the expense rate as long as the System's actuarial funded status remains within a corridor of 90% to 120%. If the funded status falls outside the corridor, a credit (if above 120%) or charge (if below 90%) will be established based on a 15-year amortization equal to the amount necessary to re-enter the corridor. Once the funded status is within the corridor, the contribution rate will return to normal cost rate, plus post-2001 changes, plus expense rate.

### 2. Actuarial Value of Assets

For purposes of determining the County contribution to the System, we use an actuarial value of assets. The asset adjustment method dampens the volatility in asset values that could occur because of fluctuations in market conditions. Use of an asset smoothing method is consistent with the long-term nature of the actuarial valuation process.

In determining the actuarial value of assets, we calculate an expected actuarial value based on cash flow for the year and imputed returns at the actuarial assumption. This expected value is compared to the market value and one-third of the difference is added to the preliminary actuarial value to arrive at the final actuarial value.

### 3. Changes since Last Valuation

None.

# APPENDIX C
# SUMMARY OF PLAN PROVISIONS

## 1. Membership

The plan covers Police Officers who are not covered by the Fairfax County Employees' Retirement System, the Uniformed Retirement System or the VRS. In addition, former Park Police Officers who elected, effective January 22, 1983, to transfer to this System from the Uniformed Retirement System are eligible for membership.

## 2. Member Contributions

10% of compensation. Starting on January 1, 1984, the contributions are made through an "employer pick-up" arrangement which results in deferral of taxes on the contributions.

Interest is credited at the rate of 5% per year.

## 3. Credited Service

All service as a member, including the period a member is on service-connected disability retirement plus certain purchased prior service for re-employed officers, is credited. In addition, credit is allowed at the rate of 1 month for 172 hours of accrued unused sick leave. For those hired on or after January 1, 2013, the amount of unused sick leave that may be used is capped at 2,080 hours.

## 4. Average Final Compensation

Compensation includes salary including pick-up contributions, roll call and holiday pay. Average final compensation is the average over the high 36 consecutive months (or shorter period of total service) including the period covered by unused sick leave.

## 5. Normal Retirement

**Eligibility**

For members employed before July 1, 1981, age 55 or completion of 20 years of service. For members employed after July 1, 1981, age 55 or completion of 25 years of service.

**Benefit**

2.8% of average final compensation for each year of service with a maximum benefit of 84%. The benefit is then increased by 3%.

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

## 6. Early Retirement

**Eligibility**

20 years of service (does not apply if hired before July 1, 1981).

**Benefit**

Normal retirement benefit calculated using average final compensation and service at early retirement, actuarially reduced. The resulting benefit is then increased by 3%.

## 7. DROP (Deferred Retirement Option Program)

**Eligibility**

All members are eligible for DROP participation upon attaining eligibility for normal service retirement. Members can only participate in DROP once, and their election is irrevocable.

**Benefit**

The benefit scheduled to begin at normal retirement will be credited to a separate DROP account within the Retirement System, accumulating with interest while the member continues to work for a period of 36 months. Upon completion of the three-year period, DROP participation ends and participants must terminate employment. At that time, the participant will receive payment of the accumulated DROP benefits and begin receiving his or her monthly retirement benefit (in the same amount as determined at commencement of DROP participation, plus annual cost-of-living increases).

The DROP account will be credited with interest at an annual rate of 5%, compounded monthly.

**Death or Disability during DROP**

*Non Service-Connected:* The effective date of the death or disability will be treated as the end of the DROP participation.

*Service-Connected Disability:* The member may elect either (1) to receive the service-connected disability benefits to which he or she would otherwise be entitled (forfeiture of DROP balance) or (2) the normal retirement benefit plus the DROP account balance.

*Service-Connected Death:* The beneficiary will receive payment of the accumulated DROP benefits and the regular service-connect benefit.

## APPENDIX C
## SUMMARY OF PLAN PROVISIONS

### 8. Service-Connected Disability

**Eligibility**

No age or service requirement.

**Benefit**

For total disability, 66-2/3% of compensation as of the date of disability less 100% of Virginia Workers' Compensation benefit, payable to 25 years of service at which time the benefit converts to 60% of the current compensation for the position from which the member retired.

### 9. Ordinary Disability

**Eligibility**

No age or service requirement.

**Benefit**

If not eligible for normal or early retirement benefit, greater of (i) 10% of average final compensation or (ii) amount determined under normal retirement benefit formula, based on average final compensation and credited service as of disability date. The resulting benefit is then increased by 3%.

### 10. Service-Connected Death

**Eligibility**

No age or service requirement.

**Benefit**

Spouse may elect a benefit of 66-2/3% of member's current salary in lieu of ordinary death benefit. The resulting benefit is then increased by 3%.

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

## 11. Ordinary Death

**Eligibility**

No age or service requirement (covers death while active or after normal, early or service-connected disability benefits).

**Benefit**

Surviving spouse receives $1,000 per month payable for the life of the spouse but ceasing upon remarriage. Surviving children under 18, or under age 23 if full time students, receive $400 per month. The maximum combination of benefits is $2,000 per month. This benefit will be increased by cost-of-living adjustments in the future. The monthly benefits for the year beginning July 1, 2013 are $2,217.12, $886.84, and $4,434.22, respectively.

## 12. Vesting

**Eligibility**

Five years of service.

**Benefit**

Normal retirement benefit based on average final compensation and service at date of termination. Benefit is payable in full at age 55 or actuarially reduced and payable at early retirement age.

A member may withdraw his contributions at termination, in which case no deferred vested benefit is payable.

## 13. Withdrawal

**Eligibility**

Not eligible for other benefits.

**Benefit**

Member contribution account balance.

## 14. Form of Payment

The normal form of payment is a life annuity with a guarantee that at least the amount of member contributions will be paid to the retiree or beneficiaries.

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

A member who is entitled to a normal or early retirement benefit may elect an actuarially equivalent Joint and Survivor pop-up benefit.

## 15. Cost-of-Living Adjustment

Each July 1, benefits are increased by the lesser of 4% or the increase in the cost-of-living index. The increase is prorated for those who have not been retired for a full year.

Cost-of-living adjustments do not apply to deferred vested benefits prior to benefit commencement. Service connected disability benefits, commencing prior to July 1, 1981, are increased by the salary index used in the actuarial valuation instead of by the cost-of-living index.

In addition to automatic adjustments, benefits may be further increased on an ad hoc basis, if actuarial experience has been favorable.

## 16. Changes since Last Valuation

None.