

**THE ANNE ARUNDEL COUNTY  
FIRE SERVICE  
RETIREMENT PLAN**

**ACTUARIAL VALUATION  
AS OF  
JANUARY 1, 2014**

Bolton Partners, Inc.  
100 Light Street, 9th Floor  
Baltimore, MD 21202

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April 24, 2014

**PERSONAL & CONFIDENTIAL**

John Peterson  
Acting Personnel Officer  
Anne Arundel County Government  
P.O. Box 6675  
Annapolis, MD 21401

***Re: Fire Service Retirement Plan Valuation***

Dear John:

The following report sets forth the actuarial valuation as of January 1, 2014 of the Anne Arundel County Fire Service Retirement Plan, for the plan year beginning on that date. The valuation is based on participant data submitted by the personnel department of Anne Arundel County, Aetna and Prudential and unaudited asset data submitted by the County.

**INVESTMENT PERFORMANCE**

The market value of plan assets as of December 31, 2013 was \$477,647,839. The average investment return for the fund for the year ended December 31, 2013 was 9.9% on a market basis and 9.2% on an actuarial basis.

The plan utilizes an actuarial averaging method to smooth out swings in investment performance and thus in asset values from year to year. Under the method, investment gains or losses above or below the 8% actuarial assumption are phased in over a five year period. As of December 31, 2013, the actuarial value of assets was \$462,235,880. Details of the development of the actuarial value of assets are set forth later in this report.

**ASSUMPTION AND METHOD CHANGES**

We have lowered the inflation assumption from 3.5% to 3.0%. This changed the following economic assumptions: investment return assumption (discount rate), salary growth assumption, total payroll growth assumption, retiree COLA increase assumptions. Most of these changes were offsetting but there is a net increase in the liabilities and the County's contribution since the drop in the investment assumption from 8.0% to 7.5% was more significant than the other changes.

**Bolton Partners, Inc.**

100 Light Street • 9th Floor • Baltimore, Maryland 21202 • (410) 547-0500 • (800) 394-0263 • Fax (410) 685-1924  
*Actuarial, Benefit and Investment Consultants*

We also have prospectively changed the amortization period for gains and losses and assumption changes from 30 to 20 years.

Finally we made a small change in the treatment of the accrued contribution in the calculation of the investment gains used in the asset smoothing method. This change was not material but was felt to be a better method.

The net effect of these changes was an increase of about \$6.7 million to the unfunded liability and an increase of about \$0.5 million to the County's contribution.

## **PRINCIPAL RESULTS**

The principal purpose of the valuation is to set forth the County's contributions for the fiscal year ending June 30, 2015. In addition, the report sets forth the information on the plan for the County's financial statements and for the plan's own financial statements.

The total recommended employer contribution for the fiscal year ending June 30, 2015 decreased from \$16,409,138 to \$15,388,777. This is in addition to employee contributions of 5.00% of pay for FSL and 7.25% for FR1 employees. The increase can be broken down to the following factors:

January 1, 2013 valuation	37.8%
Investment Gain	(1.2%)
Expense Load	0.2%
Pay Increases	(0.5%)
New Entrants/Change in Normal Cost	(3.1%)
COLA	(2.7%)
Assumption Changes	1.2%
Change to Amortization	(0.2%)
Demographics and Other Changes	2.7%
January 1, 2014 valuation	34.2%

The overall funded ratio for the plan based on the actuarial value of assets increased from 83.6% to 85.3%. Currently the market value of assets of \$478 million is \$16 million more than the actuarial value of the assets (\$462 million). This difference of \$16 million represents deferred investment gains that will be recognized in future valuations.

There have been changes in pension accounting rules. These changes do not impact funding or this valuation report. The new GASB 67 rules will impact the plan accounting in 2014 and the new GASB 68 rules will impact the employer's accounting in FY15. We have discussed with the Board and the County how these new rules are to be implemented.

The assumptions have been changed in this valuation based on last year's experience study which was adopted by the Board. There have been no changes in the plan provisions since the last valuation.

Mr. John Peterson  
April 24, 2014  
Page 3

The balance of this report sets forth details of changes in participation in the plan and the results of the valuation. A statement of funding progress under GASB 25 is also included. The Actuarial Certification at the end of this report contains other important information to understand about this valuation.

Sincerely,

**BOLTON PARTNERS, INC.**



Thomas B. Lowman, FSA



David W. Ballard, CEBS



Kristopher E. Seets, ASA, EA

TBL/DWB/KS

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## **Trust Fund Asset Statement**

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**TRUST FUND ASSET STATEMENT FOR  
YEAR ENDED DECEMBER 31, 2013**

Original Market Value 1/1/2013	\$ 437,101,928
Audit Adjustment	\$ 0
Market Value 1/1/2013	\$ 437,101,928
Receipts:	
Employer Contributions	\$ 16,109,613
Employee Contributions	2,418,408
Interest and Dividends	10,515,151
Stock Loan Income	46,084
Realized and Unrealized Gain/(Loss)	33,420,904
Other	<u>1,641,428</u>
Total Receipts:	\$ 64,151,588
Disbursements:	
Benefit Payments	\$ 21,875,017
Administrative Expenses	598,347
Investment Expenses	<u>2,694,782</u>
Total Disbursements	\$ 25,168,146
Net Increase/(Decrease)	\$ 38,983,442
Preliminary Ending Value 12/31/2013	\$476,085,370
Contribution Receivable	\$ 1,562,469
Ending Value 12/31/2013	\$477,647,839

(Note: There may be some dollar rounding differences.)

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**Development of Actuarial  
Value of Assets**

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**ACTUARIAL VALUE OF ASSETS**

	<b><u>2012</u></b>	<b><u>2013</u></b>
<b>1. MVA Beginning of Year</b>	<b>\$387,715,059</b>	<b>\$438,607,279</b>
2. Contributions	16,186,380	18,585,139
3. Benefit Payments	19,518,166	21,875,017
4. Administrative Expenses	459,574	598,347
5. Expected 8% Return	30,865,550	34,933,053
<b>6. Expected Asset Value (1. + 2. - 3. - 4. + 5.)</b>	<b>\$414,789,248</b>	<b>\$469,652,108</b>
7. Market Value End of Year	\$437,101,928	\$477,647,839
<b>8. Asset Gain/(Loss) (7. - 6.)</b>	<b>\$22,312,681</b>	<b>\$7,995,732</b>
9. 80% of 2012 Gain/(Loss) of \$22,312,681	\$17,850,145	
10. 60% of 2011 Gain/(Loss) of (\$21,490,663)	(\$12,894,398)	
11. 40% of 2010 Gain/(Loss) of \$21,120,155	\$8,448,062	
12. 20% of 2009 Gain/(Loss) of (\$7,277,832)	(\$1,455,566)	
<b>13. Initial Actuarial Value of Assets 1/1/2013</b>	<b>\$425,153,685</b>	
14. Contribution Receivable	\$1,505,351	
<b>15. Final Actuarial Value of Assets 1/1/2013</b>	<b>\$426,659,036</b>	
16. 80% of 2013 Gain/(Loss) of \$7,995,732		\$6,396,585
17. 60% of 2012 Gain/(Loss) of \$22,312,681		\$13,387,608
18. 40% of 2011 Gain/(Loss) of (\$21,490,663)		(\$8,596,265)
19. 20% of 2010 Gain/(Loss) of \$21,120,155		\$4,224,031
<b>20. Initial Actuarial Value of Assets 1/1/2014</b>		<b>\$462,235,880</b>
21. Contribution Receivable		N/A
<b>22. Final Actuarial Value of Assets 1/1/2014</b>		<b>\$462,235,880</b>
 <b>Rate of Return on Actuarial Value of Assets</b> <i>(net of investment expenses)</i>	 <b>0.7%</b>	 <b>9.2%</b>

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## **Participant Summary**

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**PARTICIPANT SUMMARY**

	<u>Inactive Participants</u>				<u>Total</u>
	<u>Active Non-Drop Participants</u>	<u>Active DROP</u>	<u>With Deferred Benefits</u>	<u>Receiving Benefits</u>	
Participants as of January 1, 2013	586	127	0	459	1,172
Retired	(6)	(14)	0	20	0
Entered DROP	(2)	2	0	0	0
Terminated Non-Vested	(9)	0	0	0	(9)
Disabled	0	0	0	0	0
Deceased	0	0	0	(5)	(5)
New Beneficiary	0	0	0	3	3
QDRO Put in Pay	0	0	0	1	1
Rehired	0	0	0	0	0
Transfers	1	0	0	0	1
New Hires	69	0	0	0	69
Data Adjustment	0	0	0	3	3
Net Change	53	(12)	0	22	63
Participants as of January 1, 2014	639	115	0	481	1,235

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## **Service - Age Distribution**

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**AGE, SERVICE AND AVERAGE SALARY DISTRIBUTION**

Age as of 1/1/2014	Under 1	01-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40 +	Total
Under 25	25 36,218	0 0	12 39,514	0 0	0 0	0 0	0 0	0 0	0 0	0 0	37 37,287
25-29	28 36,555	1 37,154	78 43,147	0 0	0 0	0 0	0 0	0 0	0 0	0 0	107 41,366
30-34	9 37,334	0 0	96 44,645	11 55,067	3 58,627	0 0	0 0	0 0	0 0	0 0	119 45,408
35-39	5 36,434	0 0	67 47,145	24 55,902	10 64,785	0 0	0 0	0 0	0 0	0 0	106 50,287
40-44	1 39,680	1 48,151	43 46,755	16 55,280	41 69,526	20 84,006	0 0	0 0	0 0	0 0	122 61,586
45-49	1 36,073	0 0	19 47,747	9 57,873	19 70,926	33 84,373	13 91,116	0 0	0 0	0 0	94 72,133
50-54	0 0	0 0	4 50,940	2 56,014	8 68,931	15 81,567	14 88,678	0 0	0 0	0 0	43 77,494
55-59	0 0	0 0	1 46,971	0 0	2 64,233	1 78,504	2 96,162	0 0	1 78,504	0 0	7 74,967
60-64	0 0	0 0	0 0	1 59,687	1 65,795	2 85,041	0 0	0 0	0 0	0 0	4 73,891
65-69	0 0	0 0	0 0	0 0	0 0	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	0 0	0 0	0 0	0 0	0 0
Total	69 36,564	2 42,653	320 45,165	63 55,943	84 68,662	71 83,613	29 90,287	0 0	1 78,504	0 0	639 54,752

*Excludes DROP participants*

Average Age: 37.86

Average Service: 10.83

Average Salary: \$54,752

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## **Actuarial Costs**

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**ACTUARIAL COSTS**

	<b><u>As of</u></b> <b><u>01/01/2013</u></b>	<b><u>As of</u></b> <b><u>01/01/2014</u></b>
Participants		
Active excluding DROP	586	639
Active DROP	127	115
Retirees and Beneficiaries	<u>459</u>	481
Total	1,172	1,235
Active Payroll (Rate at January 1 <sup>st</sup> including DROP)	\$ 43,361,686	\$ 44,950,885
1. Actuarial Liability		
Active Participants	\$250,661,554	\$263,596,728
Participants Receiving Benefits	<u>259,809,098</u>	<u>278,481,205</u>
Total	\$510,470,652	\$542,077,933
2. Actuarial Value of Assets	\$426,659,036	\$462,235,880
3. Unfunded Actuarial Liability (1-2)	\$ 83,811,615	\$ 79,842,053
4. County's Normal Cost	\$ 9,582,951	\$ 8,775,405
5. Amortization Payment	\$ 5,187,695	\$ 5,010,736
6. Estimated Expenses	\$ 423,000	\$ 529,000
7. Total Recommended Contributions as of January 1 <sup>st</sup> (4 + 5 + 6)	\$ 15,193,646	\$ 14,315,141
8. Total Recommended Contribution as of December 31 <sup>st</sup> (7 x 1.08 for 2013; 1.075 for 2014)	\$ 16,409,138	\$ 15,388,777
9. Contribution as a % of total payroll	37.8%	34.2%

**UNFUNDED LIABILITY AMORTIZATION SCHEDULE**

<u>Charges</u>	<u>Amortization Period</u>			<u>Balances</u>		<u>2014 Payment</u>
	<u>Date Created</u>	<u>Initial Years</u>	<u>Years Left</u>	<u>Initial</u>	<u>Outstanding</u>	
Unfunded Accrued Liability	01/01/2004	30	20	\$15,137,045	\$16,970,475	\$1,235,856
Actuarial Loss	01/01/2006	30	22	\$ 1,910,765	\$ 2,121,315	\$ 145,651
Actuarial Loss	01/01/2008	30	24	\$ 2,970,298	\$ 3,240,347	\$ 211,392
Actuarial Loss	01/01/2009	30	25	\$27,797,740	\$29,986,492	\$1,911,553
Asset Method Change	01/01/2011	30	27	\$23,423,233	\$24,601,622	\$1,503,833
Actuarial Loss	01/01/2012	30	28	\$20,776,427	\$21,491,310	\$1,288,875
Actuarial Loss	01/01/2013	30	29	\$25,562,434	\$26,012,144	\$1,532,247
Assumption Change	01/01/2014	20	20	\$6,659,621	\$6,659,621	\$ 484,980
<u>Credits</u>						
Actuarial Gain	01/01/2005	30	21	\$ 2,021,367	\$ 2,257,534	\$ 159,465
Actuarial Gain	01/01/2007	30	23	\$ 471,511	\$ 519,355	\$ 34,729
Assumption Change	01/01/2008	30	24	\$ 536,383	\$ 585,144	\$ 38,173
Actuarial Gain	01/01/2010	30	26	\$ 9,592,406	\$10,217,265	\$ 637,371
Actuarial Gain	01/01/2011	30	27	\$22,340,126	\$23,464,028	\$1,434,295
Assumption Change	01/01/2013	30	29	\$ 2,423,902	\$ 2,466,545	\$ 145,292
Actuarial Gain	01/01/2014	20	20	\$11,731,402	\$11,731,402	\$ 854,326
Net Total					\$79,842,053	\$5,010,736

*Note: Bases are amortized as an equal percent of payroll each year. Total payroll is assumed to increase 3.0% annually.*



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## **Assumptions and Methods**

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## ASSUMPTIONS AND METHODS

Funding Method: Projected Unit Credit Actuarial Cost Method. The contribution equals the sum of the normal cost and the amount necessary to amortize the frozen unfunded actuarial liabilities over a period of years. Amortization payments increase 3.0% (prior report used 3.5% for amortization payment growth).

Asset Method: Asset smoothing method. Spreading the investment gains or losses in excess of the assumed return over a 5-year period. Actuarial Value of Assets recognizes adjustments resulting from an audit.

Interest: 7.5% compounded annually, net of investment fees effective January 1, 2014. 8.0% in prior year.

COLA Increases: Benefits accrued before Bill 88-96 are assumed to increase by 3.0% of the original benefit each year from retirement effective January 1, 2014. 3.5% in prior year.

Benefits accrued after Bill 88-96 are assumed to increase by 1.8% of the current benefit each year from retirement effective January 1, 2014. 2.1% in prior year.

Salary Increases: The following graded schedule is used (prior year rates were 0.5% higher for all ages):

<u>Attained Age</u>	<u>% Increase at Attained Age</u>
20	6.5%
25	6.0%
30	5.5%
35	5.0%
40	4.5%
45	4.0%
50	4.0%

Mortality (Eff. 1/1/2013): *Healthy:* RP-2000 Blue Collar Mortality Table for males and females projected generationally using scale AA. Pre-Termination mortality uses 60% of these rates.

**ASSUMPTIONS AND METHODS**

(continued)

*Disabled:* RP-2000 Blue Collar Mortality Table for males and females set forward five years and then projected generationally using scale AA.

100% of pre-retirement deaths are assumed to be non-duty related.

Disability (Eff. 1/1/2013):

Sample rates are:

<u>Age</u>	<u>Rate</u>
30	0.1836%
35	0.2716%
40	0.5604%
45	0.9371%
50	1.3790%
55	0.0000%

75% of disablement is assumed to be duty-related.

Turnover (Eff. 1/1/2013):

Sample rates are:

<u>Age</u>	<u>Rate</u>
20	6.11%
25	4.73%
30	2.87%
35	2.21%
40	1.69%
45	1.21%
50	0.00%

Retirement<sup>1</sup> (Eff. 1/1/2013):

Sample Rates

<u>Age</u>	<u>Service</u>						
	<u>20</u>	<u>22</u>	<u>24</u>	<u>27</u>	<u>30</u>	<u>32</u>	<u>34</u>
40	5%	5%	20%	10%	40%	40%	100%
45	5%	5%	20%	10%	40%	40%	100%
50	10%	10%	28%	25%	40%	40%	100%
55	25%	25%	25%	25%	40%	40%	100%
59	33%	33%	33%	33%	40%	40%	100%
62	100%	100%	100%	100%	100%	100%	100%

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<sup>1</sup> Reflected "20 and out" provision

**ASSUMPTIONS AND METHODS**

*(continued)*

DROP load (Eff. 1/1/2013):

To reflect the cost of the more valuable benefits provided from the deferred retirement option program the following loads were applied:

<u>Age</u>	<u>Sample Load Rates</u>			
	<u>23</u>	<u>27</u>	<u>30</u>	<u>35</u>
44	0.45%	1.71%	2.70%	14.40%
50	2.43%	4.41%	5.40%	17.46%
55	3.24%	5.49%	6.48%	18.72%
60	3.87%	6.39%	7.29%	19.62%

Disability Leave:

Service credit for benefit formula purposes is increased by 1.75% to account for disability leave which is converted to service credit at retirement.

Military Service:

Active liabilities (which depend on credit service) are loaded by 3.25% to account for future crediting of military service.

Other Methods and Assumptions:

Administrative Expenses are \$529,000 for FY2015 and \$423,000 for FY2014 (average of actual expenses for the two years preceding the valuation date).

The rationale for the demographic assumptions is based on the results of the December 2012 Experience Study. The economic Assumptions are based on future expectations with an underlying 3.0% inflation assumption.

Marriage (Eff. 1/1/2013):

80% of employees and 70% of current retirees and disables are assumed married. Males are four years older than their spouses.

CIGNA Benefits:

Our calculations reflect that some benefits have already been purchased

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## **Plan Provisions**

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## **PLAN PROVISIONS**

<u>Normal Retirement:</u>	20 years of service <sup>2</sup> or age 50 with 5 years of service.
<u>Normal Form of Benefit:</u>	For single participants, monthly life annuities with payments guaranteed for 5 years.  For married participants, unreduced 100% Joint & Survivor Annuity with payments guaranteed for 5 years.
<u>Cost of Living Increase</u> <u>(for benefits accrued as of 1/31/97):</u>	Retiree benefits are adjusted each year. The revised benefit amount is the lesser of:  <ul style="list-style-type: none"><li>a. Base benefit multiplied by ratio of current 12 month average CPI to 12 month average CPI at retirement.</li><li>b. Prior year benefit increased by 4%.</li></ul>
<u>Cost of Living Increase</u> <u>(for benefits accrued after 1/31/97):</u>	Retiree benefits are adjusted each year. The revised benefit amount is the lesser of:  <ul style="list-style-type: none"><li>a. Prior year benefit multiplied by 60% of the increase in the current March CPI from March CPI for prior year, or</li><li>b. Prior year benefit increased by 2.5%.</li></ul>
<u>Employee Contributions:</u>	5% of pay rate for FSL and 7.25% of pay rate for FR1.
<u>Compensation:</u>	Regular annual rate of pay, exclusive of extra compensation of any kind such as overtime pay, bonuses, and commissions. Some members receive a special FY11 increase for pension purposes.
<u>Final Earnings:</u>	The average of the highest 3 years of annual basic pay.

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<sup>2</sup> Effective 7/1/2002

**PLAN PROVISIONS**

*(continued)*

<u>Benefit Formula:</u>	2 ½% of final earnings for each year of service up to 20 years plus 2% of final earnings for each year of service after 20 years (maximum 70% plus 2% times unused disability credit and pre-employment military service credit)
<u>Termination Prior to Retirement:</u>	Return of employee contributions with 3% interest.
<u>Disability:</u>	Must be totally and permanently disabled (except as the result of activities specified in the County code) regardless of length of service.
<i>Line of Duty Disability:</i>	The greater of the accrued benefit or 66 2/3% of final earnings, payable immediately, unreduced.
<i>Non-Line of Duty Disability:</i>	The greater of the accrued benefit or 20% of final earnings, payable immediately, unreduced.
<u>Pre-Retirement Spouse's Benefit:</u>	
<i>Line of Duty Death Benefit:</i>	Greater of accrued benefit or 66 2/3% of final earnings.
<i>Non-Line of Duty Death Benefit:</i>	Accrued benefit.
<u>Other Pre-Retirement Death Benefits:</u>	Return of employee contributions with 3% interest.
<u>Deferred Retirement Option Program (DROP):</u>	Allows accumulation of pension after 20 years of County service. DROP period must be between 3 and 5 years.

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## **Summary of Legislative Changes**

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## **SUMMARY OF MAJOR LEGISLATIVE CHANGES**

County Council Bill No. 48-89:

Effective 9/13/89.

The previously combined Police and Fire plan was separated into distinct plans for each group.

The reduction for retirement prior to age 50 was changed to 0.2% per month from 0.3% per month.

County Council Bill No. 34-92:

Effective 6/1/92 through 8/31/92.

Participants over age 50 or with at least 20 years of service could elect to retire with an additional pension equal to 1/12 of 2.5% of final earnings for the first 20 years of service, plus 1/12 of 2% of final earnings for each additional year of service. The additional amount could be taken as a pension increase, a lump sum, or as a temporary supplement to age 62. Appropriate actuarial adjustments apply.

State House Bill No. 687:

Effective 7/1/90.

County employees were given the opportunity to apply for credit under the County's plan for previous service with the State of Maryland (or a political subdivision of the State).

County Council Bill 88-96:

Effective 12/4/96.

The previous method of calculating cost of living increases will only apply to benefits accrued as of 1/31/97. The cost of living increase for future benefits is a compound increase equal to 60% of the annual change in the CPI, not to exceed 2.5%. Employees hired, or rehired, on or after 12/4/96 will be Tier Two employees and will have different benefits than current employees.

**SUMMARY OF MAJOR LEGISLATIVE CHANGES**

*(continued)*

Recodification:

Effective 2/25/2002.

Allows a benefit based on disability leave service and pre-plan military service to be paid over the 70% cap. Normal Retirement was changed to the earlier of 20 years of service or age 50 with 5 years of service. Elimination of Tier 2 benefits implemented a Deferred Retirement Option Program (DROP), a voluntary program that provides an alternative way to earn and receive retirement benefits.

County Council Bill 74-09:

Effective 12/11/2009.

For non-represented members, FY2010 annual pay shall be determined by increasing FY2009 annual pay by an assumed 3% for determining the final average basic pay. For represented members, FY2010 annual pay shall be determined by increasing FY2009 annual pay by an assumed 5% for determining the final average basic pay.

County Council Bill 6-10:

Effective 4/18/2010.

Provides for a disability benefit for those participants who are totally and permanently disabled as a result of qualified military service.

County Council Bill 41-10:

Effective 7/1/2010.

Reduced the DROP interest rate from 8% to 4.25%. Increased the contribution rate for all but Battalion Chief, Division Chief, Deputy Chief and Fire Chief to 7.25%.

County Council Bill No. 98-12:

Effective 5/13/2013.

Changed the definition of "final average basic pay" from highest 3 out of the last 5 years basic pays to higher 3 of all basic pays.

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**Statement No. 25 of the GASB**

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**STATEMENT NO. 25 OF THE  
 GOVERNMENTAL ACCOUNTING STANDARDS BOARD**

**Schedules of Funding Progress**

<b>Actuarial Valuation Date</b>	<b>Actuarial Value of Assets (a)</b>	<b>Unfunded AAL (UAAL) (b - a)</b>	<b>Actuarial Accrued Liability (AAL) (b)</b>	<b>Funded Ratio (a/b)</b>	<b>Covered Payroll (c)</b>	<b>UAAL as a Percentage of Covered Payroll ((b - a)/c)</b>
01/01/2004	\$286,763,188	\$15,137,045	\$301,900,234	95.0%	\$31,463,220	48.1%
01/01/2005	\$313,478,279	\$13,381,977	\$326,860,256	95.9%	\$34,871,614	38.4%
01/01/2006	\$340,274,675	\$15,511,721	\$355,786,396	95.6%	\$38,592,322	40.2%
01/01/2007	\$368,413,752	\$15,280,517	\$383,694,268	96.0%	\$43,527,351	35.1%
01/01/2008 <sup>1</sup>	\$395,884,441	\$18,467,029	\$414,351,470	95.5%	\$43,941,526	42.0%
01/01/2008 <sup>2</sup>	\$395,884,441	\$17,930,646	\$413,815,087	95.7%	\$43,941,526	40.8%
01/01/2009	\$390,551,359	\$45,969,499	\$436,520,858	89.5%	\$48,824,352	94.2%
01/01/2010	\$418,191,046	\$37,084,763	\$455,275,809	91.9%	\$49,064,454	75.6%
01/01/2011 <sup>3</sup>	\$449,253,388	\$15,236,219	\$464,489,607	96.7%	\$47,840,812	31.8%
01/01/2011 <sup>4</sup>	\$425,830,155	\$38,659,452	\$464,489,607	91.7%	\$47,840,812	80.8%
01/01/2012	\$426,196,539	\$59,899,207	\$486,095,747	87.7%	\$45,673,006	131.1%
01/01/2013 <sup>1</sup>	\$426,659,036	\$86,235,517	\$512,894,554	83.2%	\$43,361,686	198.9%
01/01/2013 <sup>2</sup>	\$426,659,036	\$83,811,615	\$510,470,652	83.6%	\$43,361,686	193.3%
01/01/2014 <sup>1</sup>	\$462,235,880	\$73,182,432	\$535,418,312	86.3%	\$44,950,885	162.8%
01/01/2014 <sup>2</sup>	\$462,235,880	\$79,842,053	\$542,077,933	85.3%	\$44,950,885	177.6%

**Schedules of County's Contributions**

<b>Year Ended December 31</b>	<b>Annual Required Contribution</b>	<b>Actual Contribution</b>	<b>Percentage Contributed</b>
2013	\$16,152,403	\$16,152,402 <sup>5</sup>	100.0%

<sup>1</sup> Prior to Assumption Changes

<sup>2</sup> After Assumption Changes

<sup>3</sup> Prior to Asset Method Change.

<sup>4</sup> After Asset Method Change.

<sup>5</sup> On an accrual basis. Subject to verification.

**STATEMENT NO. 25 OF THE  
GOVERNMENTAL ACCOUNTING STANDARDS BOARD**

*(continued)*

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

Actuarial cost method	Projected Unit Credit
Amortization method	Level percent of pay, closed
Remaining amortization period	Remaining Amortization periods range from 20 to 29 years with an average of 24 years. Starting with new bases in 2014, Assumption changes and gains and losses are amortized over 20 years and plan changes are amortized over the average future service of the active population at time of the change.
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return	7.5%
Projected salary increases	Varies by age
Post Retirement Cost-of-living adjustments	3.0% for pre 2/97 accruals 1.8% for post 2/97 accruals

## **ACTUARIAL CERTIFICATION**

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the Anne Arundel County Fire Service Retirement Plan, together with a comparison of these liabilities with the value of the plan assets, as submitted by Anne Arundel County (the County). This calculation and comparison with assets is applicable for the valuation date only. The future is uncertain, and the plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the plan will be able to provide the promised benefits in the future.

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid. The future is uncertain and the plan's actual experience will differ from those assumptions; these differences may be significant or material because these results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions. We may consider that some factors are not material to the valuation of the plan and may not provide a specific assumption for those factors. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.

Different assumptions or scenarios within the range of possibilities may also be reasonable and results based on those assumptions would be different. As a result of the uncertainty inherent in a forward looking projection over a very long period of time, no one projection is uniquely "correct" and many alternative projections of the future could also be regarded as reasonable. Two different actuaries could, quite reasonably, arrive at different results based on the same data and different views of the future. A "sensitivity analysis" shows the degree to which results would be different if you substitute alternative assumptions within the range of possibilities for those utilized in this report. We have not been engaged to perform such a sensitivity analysis and thus the results of such an analysis are not included in this report. At the County's request, Bolton Partners, Inc. is available to perform such a sensitivity analysis.

The County is responsible for selecting the plan's funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in this report. The County is solely responsible for communicating to Bolton Partners, Inc. any changes required thereto.

The County could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. This type of analysis would be a separate assignment.

In addition, decisions regarding benefit improvements, benefit changes, the trust's investment policy, and similar issues should not be based on this valuation. These are complex issues and other factors should be considered when making such decisions. These other factors might include the anticipated vitality of the local economy and future growth expectations, as well as other economic and financial factors.

**ACTUARIAL CERTIFICATION**  
*(continuation)*

The cost of this plan is determined by the benefits promised by the plan, the plan's participant population, the investment experience of the plan and many other factors. An actuarial valuation is a budgeting tool for the County. It does not affect the cost of the plan. Different funding methods provide for different timing of contributions to the plan. As the experience of the plan evolves, it is normal for the level of contributions to the plan to change. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time. The plan sponsor is responsible for funding the cost of the plan.

We make every effort to ensure that our calculations are accurately performed. These calculations are complex. Despite our best efforts, we may make a mistake. We reserve the right to correct any potential errors by amending the results of this report or by including the corrections in a future valuation report.

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the plan.

This report is based on plan provisions, census data, and asset data submitted by the County. We have relied on this information for purposes of preparing this report, but have not performed an audit. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The plan sponsor is solely responsible for the validity and completeness of this information.

The County is solely responsible for selecting the plan's investment policies, asset allocations and individual investments. Bolton Partners, Inc.'s actuaries have not provided any investment advice to the County.

The information in this report was prepared for the internal use of the County and its auditors in connection with our actuarial valuations of the pension plan. It is neither intended nor necessarily suitable for other purposes. Bolton Partners, Inc. is not responsible for the consequences of any other use.

## **ACTUARIAL CERTIFICATION**

*(continuation)*

The only purposes of this report are to:

- Present Bolton Partners, Inc.'s actuarial estimates of the Plan's liabilities and expenses for the County to incorporate, as the County deems appropriate, in its financial statements,
- Provide the recommended employer contribution for fiscal year beginning July 1, 2014.

This report may not be used for any other purpose; Bolton Partners, Inc. is not responsible for the consequences of any unauthorized use.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the "present value" of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, you selected an assumption based on the expected long-term rate of return on plan investments. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

Because valuations are a snapshot in time and are based on estimates and assumptions that are not precise and will differ from actual experience, contribution calculations are inherently imprecise. There is no uniquely "correct" level of contributions for the coming plan year.

This report provides certain financial calculations for use by the auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the Plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.

The report is conditioned on the assumption of an ongoing plan and is not meant to present the actuarial position of the Plan in the case of Plan termination. Future actuarial measurements may differ significantly from the current measurements presented in this report 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, increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status), and changes in plan provisions or applicable law.



**ACTUARIAL CERTIFICATION**

*(continuation)*

The County should notify Bolton Partners, Inc. promptly after receipt of this report if the County disagrees with anything contained in the report or is aware of any information that would affect the results of the report that has not been communicated to Bolton Partners, Inc. or incorporated therein. The report will be deemed final and acceptable to the County unless the County promptly provides such notice to Bolton Partners, Inc.

The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. They are currently compliant with the Continuing Professional Development Requirement of the Society of Actuaries. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest that would impair the objectivity of our work.

We are available to answer any questions on the material in this report to provide explanations or further details as appropriate.

**Bolton Partners, Inc.**



Thomas B. Lowman, FSA, EA



Kristopher E. Seets, ASA, EA