

**THE ANNE ARUNDEL COUNTY  
DETENTION OFFICERS' AND DEPUTY SHERIFFS'  
RETIREMENT PLAN**

**ACTUARIAL VALUATION  
AS OF  
JANUARY 1, 2013**

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

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April 30, 2013

**PERSONAL & CONFIDENTIAL**

Andrea Fulton  
Personnel Officer  
Anne Arundel County Government  
P.O. Box 6675  
Annapolis, MD 21401

***Re: Detention Officers' and Deputy Sheriffs'  
Retirement Plan Valuation***

Dear Andrea:

The following report sets forth the actuarial valuation as of January 1, 2013 of the Anne Arundel County Detention Officers' and Deputy Sheriffs' 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 and Aetna and unaudited asset data submitted by the County.

**INVESTMENT PERFORMANCE**

The market value of plan assets as of December 31, 2012 was \$94,391,869. The average investment return for the fund for the year ended December 31, 2012 was 13.2% on a market basis and 0.7% 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, 2012, the actuarial value of assets was \$92,617,788. Details of the development of the actuarial value of assets are set forth later in this report.

**PRINCIPAL RESULTS**

The principal purpose of the valuation is to set forth the County's contributions for the fiscal year ending June 30, 2014. 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.

**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*

The total recommended employer contribution for the plan year and fiscal year ending June 30, 2014 increased from \$5,193,501 to \$6,006,849. This is in addition to employee contributions of 6.75% of pay for the DT1 employees and 5% of pay for DSM employees. The increase can be broken down to the following factors:

January 1, 2012 valuation	27.7%
Pay Increases	(1.1%)
Investment Loss	2.2%
New Entrants/Change in Normal Cost	(0.7%)
COLAs	(0.1%)
Expenses	0.1%
Assumption Changes	4.3%
Demographics and Other Changes	1.2%
January 1, 2013 valuation	33.6%

The overall funded ratio based on the actuarial value of assets for the plan decreased from 71.7% to 69.3%. The increase in the contribution amount and decline in the funded ratio are due primarily to the change in assumptions and the recognition of the final part of the 2008 investment losses. Currently the market value of assets of \$94.4 million is \$1.8 million more than the actuarial value of the assets (\$92.6 million). This difference is eventually expected to reduce the County's contribution by \$0.1 million/year.

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 should discuss 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.

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.

Sincerely,

**BOLTON PARTNERS, INC.**



Thomas B. Lowman, FSA



David W. Ballard, CEBS

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## **Trust Fund Asset Statement**

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**TRUST FUND ASSET STATEMENT FOR  
YEAR ENDED DECEMBER 31, 2012**

Original Market Value 1/1/2012	\$ 81,761,419
Audit Adjustment	\$ 11,477
Market Value 1/1/2012	\$ 81,772,895
Receipts:	
Employer Contributions	\$ 5,132,576
Employee Contributions	1,169,033
Interest and Dividends	1,824,353
Stock Loan Income	243,386
Realized and Unrealized Gain/(Loss)	9,313,503
Other	<u>14,784</u>
Total Receipts:	\$ 17,697,635
Disbursements:	
Benefit Payments	\$ 5,012,917
Administrative Expenses	95,088
Investment Expenses	<u>488,702</u>
Total Disbursements	\$ 5,596,707
Net Increase/(Decrease)	\$ 12,100,927
Preliminary Ending Value 12/31/2012	\$ 93,873,823
Contribution Receivable	\$ 518,047
Ending Value 12/31/2012	\$ 94,391,869

(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**

	<u>2011</u>	<u>2013</u>
<b>1. MVA Beginning of Year</b>	<b>\$78,589,371</b>	<b>\$81,761,419</b>
2. Contributions	6,060,104	6,301,609
3. Benefit Payments	4,209,383	5,012,917
4. Administrative Expenses	81,106	95,088
5. Expected 8% Return	6,357,934	6,588,658
<b>6. Expected Asset Value (1. + 2. - 3. - 4. + 5.)</b>	<b>\$86,716,920</b>	<b>\$89,543,681</b>
7. Market Value End of Year	\$81,761,419	\$93,873,823
<b>8. Asset Gain/(Loss) (7. -6.)</b>	<b>(\$4,955,501)</b>	<b>\$4,330,142</b>
9. 80% of 2011 Gain/(Loss) of (\$4,955,501)	(\$3,964,401)	
10. 60% of 2010 Gain/(Loss) of \$4,254,775	\$2,552,865	
11. 40% of 2009 Gain/(Loss) of (\$2,093,203)	(\$837,281)	
12. 20% of 2008 Gain/(Loss) of (\$28,831,295)	(\$5,766,259)	
<b>13. Initial Actuarial Value of Assets 1/1/2012</b>	<b>\$89,776,495</b>	
14. Contribution Receivable	\$557,527	
<b>15. Final Actuarial Value of Assets 1/1/2012</b>	<b>\$90,334,022</b>	
16. 80% of 2012 Gain/(Loss) of \$4,330,142		\$3,464,114
17. 60% of 2011 Gain/(Loss) of (\$4,955,501)		(\$2,973,301)
18. 40% of 2010 Gain/(Loss) of \$4,254,775		\$1,701,910
19. 20% of 2009 Gain/(Loss) of (\$2,093,203)		(\$418,641)
<b>20. Initial Actuarial Value of Assets 1/1/2012</b>		<b>\$92,099,741</b>
21. Contribution Receivable		\$518,047
<b>22. Final Actuarial Value of Assets 1/1/2012</b>		<b>\$92,617,788</b>
 <b>Rate of Return on Actuarial Value of Assets</b> <i>(net of investment expenses)</i>	 <b>0.1%</b>	 <b>0.7%</b>



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## **Participant Summary**

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**PARTICIPANT SUMMARY**

	<u>Inactive Participants</u>			<u>Total</u>
	<u>Active Participants</u>	<u>With Deferred Benefits</u>	<u>Receiving Benefits</u>	
Participants as of January 1, 2012	347	9	179	535
Retired	(14)	0	14	0
Terminated Vested	(2)	2	0	0
Terminated Non Vested	(17)	0	0	(17)
Disabled	(3)	0	3	0
Deceased/Payment Expired	0	0	(3)	(3)
Lump Sum	0	0	(1)	(1)
New QDRO	0	0	1	1
Transfers in from:				
Fire Plan	0	0	0	0
Police Plan	0	0	0	0
Employee Plan	1	0	0	1
Transfers out to:				
Fire Plan	0	0	0	0
Police Plan	0	0	0	0
Employee Plan	0	0	0	0
New Hires	26	0	0	26
New Beneficiary	0	0	1	1
Data Adjustment	0	1	3	4
Net Change	(9)	3	18	12
Participants as of January 1, 2013	338	12	197	547

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## **Service - Age Distribution**

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Anne Arundel County, Maryland  
 Detention Officers' and Deputy Sheriffs' Retirement Plan

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**AGE, SERVICE AND AVERAGE SALARY DISTRIBUTION**

Age as of 1/1/2013	Under 1	01-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40 +	Total
Under 25	8 38,188	8 39,465	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	16 38,827
25-29	6 38,052	12 38,880	10 43,815	0 0	0 0	0 0	0 0	0 0	0 0	0 0	28 40,465
30-34	2 38,595	10 39,052	10 44,808	3 47,461	0 0	0 0	0 0	0 0	0 0	0 0	25 42,327
35-39	1 38,052	5 38,889	14 45,913	17 52,643	8 57,643	0 0	0 0	0 0	0 0	0 0	45 49,586
40-44	4 39,478	3 43,408	9 44,889	22 52,152	23 61,900	4 69,953	0 0	0 0	0 0	0 0	65 54,508
45-49	3 40,785	2 40,197	10 46,455	4 60,211	19 62,860	7 72,076	1 86,934	0 0	0 0	0 0	46 58,564
50-54	1 41,199	6 51,670	10 45,392	9 53,220	18 62,565	10 74,157	2 62,492	2 80,877	0 0	0 0	58 59,286
55-59	0 0	2 40,197	7 50,797	7 56,443	11 59,952	1 64,827	1 87,281	0 0	1 89,459	0 0	30 57,737
60-64	0 0	6 43,186	2 50,559	6 52,687	5 87,347	0 0	0 0	0 0	0 0	0 0	19 58,584
35-69	0 0	0 0	0 0	3 54,418	3 56,279	0 0	0 0	0 0	0 0	0 0	6 55,349
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	25 38,821	54 41,248	72 45,947	71 53,225	87 62,878	22 72,306	4 74,800	2 80,877	1 89,459	0 0	338 52,949

Average Age: 44.27

Average Service: 10.96

Average Salary: \$52,949

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## **Actuarial Costs**

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**ACTUARIAL COSTS**

	<b><u>As of</u></b> <b><u>01/01/2012</u></b>	<b><u>As of</u></b> <b><u>01/01/2013</u></b>
Participants		
Active	347	338
Inactive receiving benefits	179	197
Inactive with deferred benefits	<u>9</u>	<u>12</u>
Total	535	547
Active Payroll (Rate at January 1 <sup>st</sup> )	\$18,760,664	\$17,896,574
1. Accrued Liabilities		
Active Participants	\$66,448,848	\$64,678,225
Participants Receiving Benefits	58,779,260	67,754,241
Participants with Deferred Benefits	<u>759,176</u>	<u>1,245,619</u>
Total	\$125,987,284	\$133,678,085
2. Actuarial Value of Assets	\$90,334,022	\$92,617,788
3. Unfunded Actuarial Liability	\$35,653,262	\$ 41,060,297
4. County's Normal Cost	\$ 2,484,395	\$ 2,863,247
5. Amortization Payment	\$ 2,244,402	\$ 2,610,650
6. Estimated Expenses	\$ 80,000	\$ 88,000
7. Total Recommended Contributions as of January 1 <sup>st</sup>	\$ 4,808,797	\$ 5,561,897
8. Total Recommended Contribution as of December 31 <sup>st</sup>	\$ 5,193,501	\$ 6,006,849
9. Contributions as a Percentage of Payroll	27.7%	33.6%

**UNFUNDED LIABILITY AMORTIZATION SCHEDULE**

<u>Charges</u>	<u>Amortization Period</u>			<u>Balances</u>		<u>2013 Payment</u>
	<u>Date Created</u>	<u>Initial Years</u>	<u>Years Left</u>	<u>Initial</u>	<u>Outstanding</u>	
Unfunded Accrued Liability	01/01/2003	30	20	\$8,245,799	\$ 9,244,560	\$672,123
Actuarial Loss	01/01/2005	30	22	\$ 780,906	\$ 866,962	\$ 59,419
Actuarial Loss	01/01/2006	30	23	\$1,772,183	\$ 1,952,017	\$130,288
Plan and Assumption Change	01/01/2006	30	23	\$ 744,267	\$ 819,799	\$ 54,716
Actuarial Loss	01/01/2008	30	25	\$3,220,741	\$ 3,474,337	\$221,040
Assumption Change	01/01/2008	30	25	\$1,378,213	\$ 1,486,731	\$ 94,587
Actuarial Loss	01/01/2009	30	26	\$7,322,632	\$ 7,799,634	\$485,559
Actuarial Loss	01/01/2010	30	27	\$ 4,497,219	\$ 4,747,283	\$ 289,574
Asset Method Change	01/01/2011	30	28	\$ 5,057,664	\$ 5,231,691	\$313,071
Actuarial Loss	01/01/2012	30	29	\$3,386,496	\$ 3,446,073	\$202,536
Assumption Change	01/01/2013	30	30	\$1,256,642	\$ 1,256,642	\$ 72,615
Actuarial Loss	01/01/2013	30	30	\$3,722,087	\$ 3,722,087	\$215,079
<u>Credits</u>						
Actuarial Gain and Assumption Change	01/01/2004	30	21	\$1,216,481	\$ 1,358,607	\$ 95,803
Actuarial Gain	01/01/2007	30	24	\$1,161,281	\$ 1,266,859	\$ 82,488
Actuarial Gain	01/01/2011	30	28	\$ 350,009	\$ 362,053	\$ 21,666
Net					\$41,060,297	\$2,610,650

*Note: Bases are amortized as an equal percent of payroll each year. Total payroll is assumed to increase 3.5% annually.*

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## **Assumptions and Methods**

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## **ASSUMPTIONS AND METHODS**

Funding Method:

Projected Unit Credit Cost Method. This method divides the cost of funding benefits into two parts: normal cost and actuarial accrued liability. The normal cost is the estimated cost of the benefits that are considered to be accrued in that plan year. The actuarial accrued liability is the estimated cost of all benefits that are considered to have been accrued to the valuation date. The unfunded actuarial accrued liability is the actuarial accrued liability minus plan assets. An actuarial gain or loss is calculated each year based on the change in the unfunded actuarial accrued liability. The total contribution is the normal cost plus (minus) a payment to amortize actuarial losses (gains) that occur. The benefit that is considered to be accrued in a year is the participant's projected benefit divided by his total projected years of service.

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:

8% compounded annually.

COLA Increases:

Benefits accrued before Bill 88-96 are assumed to increase by 3.5% of the original benefit each year from retirement.

Benefits accrued after Bill 88-96 are assumed to increase by 2.1% of the current benefit each year from retirement.

**ASSUMPTIONS AND METHODS**

(continued)

Salary Increases:

The following graded schedule is used:

<u>Attained Age</u>	<u>% Increase at Attained Age</u>
20	6.50%
25	6.50%
30	6.00%
35	5.75%
40	5.25%
45	4.75%
50	4.75%

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.

*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	0.245%
35	0.362%
40	0.747%
45	1.250%
50	1.839%
55	0.000%

75% of disablements are assumed to be duty-related.

Turnover (Eff. 1/1/2013):

Sample rates are:

<u>Age</u>	<u>Less Than 10 Years of Service</u>		<u>10 or More Years of Service</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
20	12.38%	18.75%	8.67%	13.13%
25	8.98%	14.06%	6.29%	9.84%
30	6.81%	11.25%	4.77%	7.88%
35	4.95%	8.44%	3.47%	5.91%
40	3.41%	6.19%	2.39%	4.33%
45	1.86%	3.94%	1.30%	2.76%
50	0.00%	0.00%	0.00%	0.00%

**ASSUMPTIONS AND METHODS**

(continued)

Retirement (Category I) (Eff. 1/1/2013):

Retirement rates are as follows:

<b>Less than 20 years of service</b>	
<b>Age</b>	<b>Rate</b>
50	10%
51-54	5%
55-59	20%
60	100%

<b>20 or more years of service</b>		
<b>Age</b>	<b>20 years but less than 30 years</b>	<b>30 or more years</b>
40-49	15%	
50-59	30%	100%
60	100%	100%

Retirement (Category II) (Eff. 1/1/2013):

Retirement rates are as follows:

<b>Age</b>	<b>&lt; 20 years of service</b>	<b>20 years of service</b>	<b>21-29 years of service</b>	<b>≥ 30 years of service</b>
<50	N/A	5%	2%	100%
50	10%	30%	30%	100%
51-59	10%	15%	15%	100%
60-64	10%	20%	20%	100%
65+	100%	100%	100%	100%

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.

In addition, it is assumed that participants with 30 or more years of service will have credit for 1 year of combined Disability Leave and military service.

Marriage (Eff. 1/1/2013):

It is assumed that 80% of employees are married.

Other Methods and Assumptions:

Administrative Expenses are \$88,000 for FY2014 and \$80,000 for FY2013 (average of actual expenses for the two years preceding the valuation date).

It is assumed that vested terminations prior to age 40 will choose to take a lump sum while those 40 and older will choose a deferred benefit.

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## **Plan Provisions**

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## **PLAN PROVISIONS**

<u>Normal Retirement Age:</u>	Category I Participants: 20 years of service, or age 50 with 5 years.  Category II Participants: Age 50 with 5 years of service.
<u>Normal Form of Benefit:</u>	Monthly life annuity with payments guaranteed for 5 years.
<u>Cost of Living Increase (simple, 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. Prior year benefit plus base benefit multiplied by increase in current CPI from CPI for prior year, or</li><li>b. Benefit increased by 4% of original benefit.</li></ul>
<u>Cost of Living Increase (compound, 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. Benefit increased by 2.5%.</li></ul>
<u>Employee Contributions:</u>	5% of compensation for DSM and 6.75% for DT1.
<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 FY10 increase for pension purposes.
<u>Final Earnings:</u>	The average of the highest 3 consecutive years of the last 5 years of annual basic pays.
<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)

## **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>Early Retirement:</u>	Reduced benefits are available the first of any month coincident with or next following the completion of 20 years of continuous service.
<u>Termination Prior to Retirement:</u>	
<i>Less than 5 years of service:</i>	Return of employee contributions with 4.25% interest.
<i>5 years of service or more:</i>	At the discretion of the employee, either a return of contributions with interest or the accrued normal retirement benefit taking into account final earnings and service at date of termination, payable at normal retirement date.
<u>Disability Benefit:</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 4.25% interest, and a lump sum equal to 50% of annual pay.

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## **Summary of Legislative Changes**

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## **SUMMARY OF MAJOR LEGISLATIVE CHANGES**

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 90-93:

Effective 12/22/93.

Plan participants are required to pay the full actuarial value for service purchases. Purchases can only be made at retirement. To be eligible, an employee must have 60 months of County service. Existing plan participants must be notified of their right to purchase service under existing law.

County Council Bill No. 94-93:

Effective 11/19/93.

All current and future employees shall be 100% vested after 5 years of Credited Service.

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)*

County Council Bill No. 41-99:

Effective 6/15/99.

Employees paid under the deputy sheriff employees pay schedule become Tier Two members of the Detention Center Plan effective as of January 1, 1999. Service credited under the Employees' Plan will count as credited service in the Detention Center Plan and no future benefit will be paid from the Employees' Plan. Assets are transferred from the Employees' Plan to the Detention Center Plan in an amount equal to the projected unit credit accrued liability in the Employees' Plan.

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. Elimination of Tier 2 benefits. Changed early retirement factors. Added a death benefit.

County Council Bill No. 32-04:

Effective 7/1/2004.

Allows retirement after 20 years of service for "Category I" participants. Changes vesting for new hires from 5 years to 20 years. Provides for employees contributions to be made on a pre-tax ("pick up") basis.

County Council Bill No. 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 D3 and S2 members, FY2010 annual pay shall be determined by increasing FY2009 annual pay by an assumed 4% for determining the final average basic pay.

**SUMMARY OF MAJOR LEGISLATIVE CHANGES**

*(continued)*

County Council Bill No. 78-09:

Effective 11/16/2009.

For D1 and D2 members, FY2010 annual pay shall be determined by increasing FY2009 annual pay by an assumed 4% for determining the final average basic pay.

County Council Bill No. 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 No. 41-10:

Effective 7/1/2010.

Increased the contribution rate for Detention Officers, Detention Corporals and Detention Sergeants to 6.75%. Added a "pop-up" option.

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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>
01/01/2003	\$38,889,689	\$8,245,799	\$47,135,488	82.5%	\$14,690,339	56.1%
01/01/2004	\$45,710,154	\$7,174,384	\$52,884,538	86.4%	\$15,396,301	46.6%
01/01/2005	\$52,200,204	\$8,072,549	\$60,272,753	86.6%	\$15,355,590	52.6%
01/01/2006	\$58,379,332	\$10,713,394	\$69,092,726	84.5%	\$16,794,068	63.8%
01/01/2007	\$66,233,757	\$9,712,479	\$75,946,236	87.2%	\$17,367,873	55.9%
01/01/2008 <sup>1</sup>	\$74,355,736	\$13,061,602	\$87,417,338	85.1%	\$18,122,458	72.1%
01/01/2008 <sup>2</sup>	\$74,355,736	\$14,439,815	\$88,795,551	83.7%	\$18,122,458	79.7%
01/01/2009	\$76,525,847	\$21,959,305	\$98,485,152	77.7%	\$19,785,653	111.0%
01/01/2010	\$84,490,610	\$26,787,087	\$111,277,697	75.9%	\$20,203,895	132.6%
01/01/2011 <sup>3</sup>	\$92,968,797	\$26,798,406	\$119,767,203	77.6%	\$19,310,216	138.8%
01/01/2011 <sup>4</sup>	\$87,911,133	\$31,856,070	\$119,767,203	73.4%	\$19,310,216	165.0%
01/01/2012	\$90,334,022	\$35,653,262	\$125,987,284	71.7%	\$18,760,664	190.0%
01/01/2013 <sup>1</sup>	\$92,617,788	\$39,803,655	\$132,421,443	69.9%	\$17,896,574	222.4%
01/01/2013 <sup>2</sup>	\$92,617,788	\$41,060,297	\$133,678,085	69.3%	\$17,896,574	229.4%

**Schedules of County's Contributions**

<b><i>Year Ended December 31</i></b>	<b><i>Annual Required Contribution</i></b>	<b><i>Annual Contribution</i></b>	<b><i>Percentage Contributed</i></b>
2012	\$5,141,277	\$5,141,280 <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
Remaining amortization period	Remaining Amortization periods range from 20 to 30 years with an average of 25 years
Asset valuation method	5-year smoothed market
Actuarial assumptions:	
Investment rate of return	8.0%
Projected salary increases	Varies by age
Post Retirement Cost-of-living adjustments	3.5% for pre 2/97 accruals 2.1% for post 2/97 accruals

## **Actuarial Certification**

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the pension plan, together with a comparison of these liabilities with the value of the plan assets, as submitted by 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 personnel department of Anne Arundel 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 Anne Arundel 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 Anne Arundel County to incorporate, as Anne Arundel County deems appropriate, in its financial statements and
- Provide the recommended employer contribution for the fiscal year ending June 30, 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.

Anne Arundel 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



**Actuarial Certification**

*(Continuation)*

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 actuary meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. He is 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.

I am 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