

**THE ANNE ARUNDEL COUNTY  
EMPLOYEES'  
RETIREMENT PLAN**

**ACTUARIAL VALUATION  
AS OF  
JANUARY 1, 2015**

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

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April 10, 2015

**PERSONAL & CONFIDENTIAL**

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

***Re: Employees' Retirement Plan Valuation***

Dear Andrea:

The following report sets forth the actuarial valuation as of January 1, 2015 of the Anne Arundel County Employees' 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, 2014 was \$583,936,391. The average investment return for the fund for the year ended December 31, 2014 was 5.0% on a market basis and 8.8% 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 7.5% actuarial assumption are phased in over a five year period. As of December 31, 2014, the actuarial value of assets was \$582,795,438. 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, 2016. 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 is also included. The information for the plan's financial reporting requirements and the County's financial statements is included in a separate report.

**Bolton Partners, Inc.**

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*Actuarial, Benefit and Investment Consultants*

The total recommended employer contribution for the plan year and fiscal year ending June 30, 2016 increased from \$24,893,955 to \$26,415,723. This is in addition to employee contributions of 4% of pay from the employees in Tier 1. The contribution increased in dollars because of a 9.7% increase in covered payroll. However, it decreased as a percentage of payroll. The decrease can be broken down to the following factors:

January 1, 2014 valuation	21.5%
Investment Gain	(1.1%)
Pay Increases	1.3%
New Entrants/Change in Normal Cost	(0.4%)
COLA	(1.1%)
Expenses	(0.1%)
Demographics and Other Changes	0.7%
January 1, 2015 valuation	20.8%

The overall funded ratio for the plan based on the actuarial value of assets increased from 74.2% to 74.6%. Currently the market value of assets of \$584 million is \$1 million more than the actuarial value of the assets (\$583 million). This difference of \$1 million represents deferred investment gains that will be recognized in future valuations. In the prior valuation, there were \$21 million of deferred gains.

There have been no changes in the actuarial assumptions or methods since the last valuation. The assumptions used in this valuation are based on the December 2012 review of the plan's experience.

We have introduced on page 22 a new "Risk Metrics" sheet. This shows interesting trends and the impact of the 9.7% payroll increase in these trends.

Thomas Lowman and Kristopher Seets are Fellows of the Society of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. 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, EA



Kristopher E. Seets, FSA, EA



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, 2014**

Original Market Value 1/1/2014	\$564,153,635
Audit Adjustment	\$ (1)
Market Value 1/1/2014	\$564,153,634
Receipts:	
Employer Contributions	\$ 24,368,957
Employee Contributions	4,630,288
Interest and Dividends	15,013,079
Realized and Unrealized Gain/(Loss)	11,443,123
Stock Loan Income	35,880
Other	<u>5,026,762</u>
Total Receipts:	\$ 60,518,089
Disbursements:	
Benefit Payments	\$ 39,011,986
Administrative Expenses	518,541
Investment Expenses	<u>3,684,356</u>
Total Disbursements	\$ 43,214,883
Net Increase/(Decrease)	\$ 17,303,207
Preliminary Ending Value 12/31/2014	\$581,456,841
Contribution Receivable	\$ 2,479,550
Ending Value 12/31/2014	\$583,936,391

(Note: There may be dollar rounding differences)

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**Development of Actuarial  
Value of Assets**

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**ACTUARIAL VALUE OF ASSETS**

	<b><u>2013</u></b>	<b><u>2014</u></b>
<b>1. MVA Beginning of Year</b>	<b>\$525,166,044</b>	<b>\$566,519,209</b>
2. Contributions	26,814,640	29,113,221
3. Benefit Payments	36,729,818	39,011,986
4. Administrative Expenses	716,755	518,541
5. Expected 8%/7.5% Return	41,588,006	42,098,292
<b>6. Expected Asset Value (1. + 2. - 3. - 4. + 5.)</b>	<b>\$556,122,117</b>	<b>\$598,200,195</b>
7. Market Value End of Year	\$566,519,209	\$583,936,391
<b>8. Asset Gain/(Loss) (7. - 6.)</b>	<b>\$10,397,092</b>	<b>(\$14,263,804)</b>
9. 80% of 2013 Gain/(Loss) of \$10,397,092	\$8,317,674	
10. 60% of 2012 Gain/(Loss) of \$28,227,771	\$16,936,663	
11. 40% of 2011 Gain/(Loss) of (\$24,886,836)	(\$9,954,734)	
12. 20% of 2010 Gain/(Loss) of \$27,036,112	\$5,407,222	
<b>13. Actuarial Value of Assets 1/1/2014</b>	<b>\$545,812,384</b>	
14. 80% of 2014 Gain/(Loss) of (\$14,263,804)		(\$11,411,043)
15. 60% of 2013 Gain/(Loss) of \$10,397,092		\$6,238,255
16. 40% of 2012 Gain/(Loss) of \$28,227,771		\$11,291,108
17. 20% of 2011 Gain/(Loss) of (\$24,886,836)		(\$4,977,367)
<b>18. Actuarial Value of Assets 1/1/2015</b>		<b>\$582,795,438</b>
 <b>Rate of Return on Actuarial Value of Assets</b> <i>(net of investment expenses)</i>	 <b>9.4%</b>	 <b>8.8%</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, 2014	2,125	271	1,544	3,940
Retired	(73)	(14)	87	0
Terminated Vested	(27)	27	0	0
Terminated Non-Vested/Paid Lump Sum	(58)	(11)	0	(69)
Disabled	(3)	0	3	0
Deceased/Payments Expired	(3)	0	(34)	(37)
New Beneficiary	0	0	6	6
Rehires	4	(4)	0	0
New QDRO	0	0	2	2
Transfers In	1	0	0	1
Transfers Out	(1)	0	0	(1)
New Hires	243	0	0	243
Data Adjustment	(1)	0	15	14
Net Change	82	(2)	79	159
Participants as of January 1, 2015	2,207	269	1,623	4,099

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## **Service - Age Distribution**

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**AGE, SERVICE AND AVERAGE SALARY DISTRIBUTION**

Age as of 1/1/2015	Under 1	01-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40 +	Total
Under 25	31 35,543	15 33,859	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	46 34,994
25-29	35 44,827	58 41,049	33 43,165	1 49,962	0 0	0 0	0 0	0 0	0 0	0 0	127 42,710
30-34	35 47,084	58 46,844	52 47,320	16 50,334	0 0	0 0	0 0	0 0	0 0	0 0	161 47,397
35-39	40 47,579	38 54,067	65 54,808	43 55,136	11 61,439	1 66,301	0 0	0 0	0 0	0 0	198 53,703
40-44	25 52,703	43 51,809	60 52,545	53 57,939	32 63,224	11 61,364	0 0	0 0	0 0	0 0	224 55,656
45-49	25 47,893	43 41,956	82 51,111	56 61,648	41 63,856	43 67,342	40 67,419	1 53,290	0 0	0 0	331 57,126
50-54	23 47,301	34 55,567	89 58,341	72 60,359	63 65,274	36 72,234	66 72,203	27 66,541	2 66,460	0 0	412 62,920
55-59	13 43,791	41 51,146	64 53,118	48 67,365	34 69,267	39 66,880	60 73,404	27 74,740	21 70,491	3 71,772	350 63,945
60-64	12 31,907	29 39,095	47 55,422	31 69,639	34 64,503	22 71,923	21 70,633	15 74,228	14 79,923	12 73,371	237 61,822
65-69	4 52,429	7 17,773	15 52,562	20 62,530	15 72,474	9 93,975	13 72,736	2 59,883	3 104,806	2 62,913	90 64,574
70 & Up	0 0	5 14,387	5 64,907	7 66,520	6 59,312	2 82,307	3 50,556	2 30,519	1 54,829	0 0	31 53,230
Total	243 45,212	371 45,845	512 52,932	347 61,106	236 65,341	163 70,175	203 71,167	74 69,758	41 75,644	17 71,858	2,207 57,585

Average Age: 48.60

Average Service: 12.37

Average Salary: \$57,585

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## **Actuarial Costs**

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**ACTUARIAL COSTS**

	<b><u>As of</u></b> <b><u>01/01/2014</u></b>	<b><u>As of</u></b> <b><u>01/01/2015</u></b>
Participants		
Active	2,125	2,207
Terminated Vested	271	269
Disabled	78	79
Retirees	1,344	1,415
Beneficiaries	<u>122</u>	<u>129</u>
Total	3,940	4,099
Active Payroll (Rate at January 1 <sup>st</sup> )	\$115,809,426	\$127,090,869
1. Actuarial Liability		
Active Participants	\$275,405,717	\$294,728,016
Terminated Vested Participants	17,715,625	19,792,254
Participants Receiving Benefits	<u>442,607,691</u>	<u>466,585,690</u>
Total	\$735,729,033	\$781,105,960
2. Actuarial Value of Assets	\$545,812,384	\$582,795,438
3. Unfunded Actuarial Liability (1-2)	\$189,916,649	\$198,310,522
4. County's Normal Cost	\$ 10,654,931	\$ 11,229,597
5. Amortization Payment	\$ 11,866,236	\$ 12,725,169
6. Estimated Expenses	\$ 636,000	\$ 618,000
7. Total Recommended Contributions as of January 1 <sup>st</sup> (4 + 5 + 6)	\$ 23,157,167	\$ 24,572,766
8. Total Recommended Contribution as of December 31 <sup>st</sup> (7 x 1.075)	\$ 24,893,955	\$ 26,415,723
9. Contribution as a % of total payroll	21.5%	20.8%

**UNFUNDED LIABILITY AMORTIZATION SCHEDULE**

<u>Charge</u>	<u>Amortization Period</u>			<u>Balances</u>		<u>2015 Payment</u>
	<u>Date Created</u>	<u>Initial Years</u>	<u>Years Left</u>	<u>Initial</u>	<u>Outstanding</u>	
Actuarial Loss	01/01/2005	30	20	\$ 9,888,883	\$11,033,903	\$ 803,532
Actuarial Loss	01/01/2006	30	21	\$ 7,157,528	\$ 7,955,699	\$ 561,965
Actuarial Loss	01/01/2007	30	22	\$ 8,028,164	\$ 8,870,378	\$ 609,048
Assumption Change	01/01/2008	30	23	\$13,407,985	\$14,698,230	\$ 982,853
Actuarial Loss	01/01/2009	30	24	\$45,836,717	\$49,765,833	\$3,246,591
Asset Method Change	01/01/2011	30	26	\$28,621,055	\$30,340,150	\$1,892,673
Actuarial Loss	01/01/2012	30	27	\$30,934,590	\$32,335,954	\$1,976,612
Assumption Change	01/01/2013	30	28	\$12,159,909	\$12,518,323	\$ 750,747
Actuarial Loss	01/01/2013	30	28	\$33,631,456	\$34,622,746	\$2,076,392
Assumption Change	01/01/2014	20	19	\$20,355,789	\$20,288,906	\$1,526,860
Actuarial Loss	01/01/2015	20	20	\$ 6,906,327	\$ 6,906,327	\$ 502,946
<u>Credit</u>						
Unfunded Accrued						
Liability	01/01/2004	30	19	\$ 215,150	\$ 240,428	\$ 18,094
Actuarial Gain	01/01/2008	30	23	\$ 5,585,598	\$ 6,123,096	\$ 409,444
Actuarial Gain	01/01/2010	30	25	\$ 1,937,140	\$ 2,079,708	\$ 132,575
Actuarial Gain	01/01/2011	30	26	\$ 3,996,644	\$ 4,236,696	\$ 264,293
Actuarial Gain	01/01/2014	20	19	\$18,406,477	\$18,345,999	\$1,380,644
Net Total					\$198,310,522	\$12,725,169

Bases are amortized as an equal percent of payroll each year. Total payroll is assumed to increase 3.0% annually. Since the January 1, 2015 amortization payment of \$12,725,169 is not sufficient to cover the interest on the plan's unfunded liability, the unfunded liability is expected to grow for an initial period.

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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 and any actuarial gains or losses over a period of years. Amortization payments increase 3.0%.

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 expenses.

COLA Increases: Benefits accrued before Bill 88-96 are assumed to increase by 3.0% of the original benefit each year from retirement.

Benefits accrued after Bill 88-96 are assumed to increase by 1.8% of the current benefit each year from retirement.

Salary Increases: The following graded schedule is used:

<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	3.5%
55	3.5%

Mortality: *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 nine years and then projected generationally using scale AA.

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

**ASSUMPTIONS AND METHODS**

(continued)

Disability:

Sample rates are:

<u>Age</u>	<u>Rate</u>
30	.0198%
35	.0297%
40	.0607%
45	.1003%
50	.1622%
55	.2661%
60	.3973%
64	.5408%

10% of disablements are assumed to be duty-related.

Turnover<sup>1</sup>:

Sample rates are:

<u>Age</u>	<u>Males</u>	<u>Rate</u>	<u>Females</u>
20	12.47%		21.57%
25	9.97%		18.12%
30	6.78%		13.34%
35	4.37%		9.05%
40	3.48%		7.48%
45	2.40%		5.95%
50	0.63%		1.56%
55	0.43%		1.07%
60	0.00%		0.00%

Retirement:

Sample Rates

<u>Age</u>	<u>Service</u>		
	<u>20</u>	<u>30</u>	<u>31</u>
50	6%	40%	40%
55	9%	30%	5%
60	15%	15%	15%
65	40%	40%	40%
68	100%	100%	100%

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<sup>1</sup> Tier 1 terminations prior to age 40 are assumed to elect a refund of employee contributions with interest

## **ASSUMPTIONS AND METHODS**

*(continued)*

Disability Leave:

Active liabilities (which depend on credited service) are loaded by 1.5% to account for future crediting of disability service.

Military Service:

Active liabilities (which depend on credited service) are loaded by 1% to account for future crediting of military service.

Marriage:

It is assumed that 70% of employees are married.

Other Methods and Assumptions:

Administrative Expenses are \$618,000 for FY2016 and \$636,000 for FY2015 (average of actual expenses for the two years preceding the valuation date).

Males are assumed to be four years older than their spouses.

The Tier 1 service cap of 60% is valued as 62% to account for Disability and Military service credit not being limited by the 30-year cap on service. Actual military service information for actives is not available.

Members are assumed to stay in their current tier.

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.

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## **Plan Provisions**

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**PLAN PROVISIONS**

(for Members in Tier 1)

<u>Normal Retirement Age:</u>	Age 60, or if earlier, when the participant has reached 30 years of service.
<u>Early Retirement Age:</u>	Age 50 and the completion of 20 years of service.
<u>Normal Form of Benefit:</u>	Monthly life annuity with modified cash refund.
<u>Cost of Living Increase</u> <u>(simple, for benefits accrued as of 1/31/97):</u>	Retiree benefits are adjusted each year. The revised benefit amount is the lesser of:  a. Prior year benefit plus base benefit multiplied by increase in the current March CPI from March CPI for prior year, or b. Benefit increased by 3% of original benefit.
<u>Cost of Living Increase</u> <u>(compound, for benefits accrued after 1/31/97):</u>	Retiree benefits are adjusted each year. The revised benefit amount is the lesser of:  a. Prior year benefit multiplied by 60% of the increase in the current March CPI from March CPI for prior year, or b. Benefit increased by 2.5%.
<u>Employee Contributions:</u>	4% of compensation.
<u>Compensation:</u>	Regular annual rate of pay, exclusive of extra compensation of any kind such as overtime pay, bonuses, and commissions.
<u>Final Earnings:</u>	The average of the highest 3 years of annual basic pay.
<u>Normal Retirement Benefit Formula:</u>	2% of final earnings for each year of service, maximum 60%.
<u>Early Retirement Benefit Formula:</u>	Same as normal retirement, but reduced by the following factors:

**PLAN PROVISIONS**

(for Members in Tier 1)

(continued)

<u>Years Early</u>	<u>Reduction Factor</u>
1	2%
2	5%
3	9%
4	14%
5	20%
6	28%
7	36%
8	44%
9	52%
10	60%

Termination Prior to Retirement:

*Less than 5 years of service:*

Return of employee contributions with 4.25% interest.

*5 years of service or more:*

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.

Disability:

Must be totally and permanently disabled (except as the result of activities specified in the County code) regardless of length of service.

*Line of Duty Disability:*

The greater of the accrued benefit or 66 2/3% of final earnings, payable immediately, unreduced.

*Non-Line of Duty Disability:*

Five years of service are required to receive non-duty benefits. The greater of the accrued benefit or 25% of final earnings, payable immediately, unreduced.

**PLAN PROVISIONS**

(for Members in Tier 1)

*(continued)*

Pre-Retirement Spouse's Benefit:

*Married and eligible for early retirement:*

The greatest of:

- \$10 per month
- 50% of the final earnings
- The accrued benefit, reduced actuarially for early commencement and the joint and 100% survivor form.

Other Pre-Retirement Death Benefits:

Return of employee contributions with 4.25% interest plus a lump sum of 50% of final earnings.

**PLAN PROVISIONS**

(for Members in Tier 2)

<u>Normal Retirement Age:</u>	Age 60, or if earlier, when the participant has reached 30 years of service.
<u>Early Retirement Age:</u>	Age 50 and the completion of 20 years of service.
<u>Normal Form of Benefit:</u>	Monthly life annuity.
<u>Cost of Living Increase</u> <u>(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>	No employee contributions required or allowed.
<u>Compensation:</u>	Regular annual rate of pay, exclusive of extra compensation of any kind such as overtime pay, bonuses, and commissions.
<u>Final Earnings:</u>	The average of the highest 3 years of the last 5 years of annual basic pays.
<u>Normal Retirement Benefit Formula:</u>	1.0% of final earnings for each year of service.
<u>Early Retirement Benefit Formula:</u>	Same as normal retirement, but reduced for early commencement (using the same factors as Tier 1).
<u>Termination Prior to Retirement:</u> <i>Less than 5 years of service:</i>	No benefit is payable.
<i>5 years of service or more:</i>	The accrued normal retirement benefit taking into account final earnings and service at date of termination, payable at normal retirement date.
<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.



**PLAN PROVISIONS**

(for Members in Tier 2)

(continued)

<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>	Five years of service are required to receive non-duty benefits. The greater of the accrued benefit or 25% of final earnings, payable immediately, unreduced.
<u>Pre-Retirement Spouse's Benefit:</u>	
<i>Married and eligible for early retirement:</i>	The greatest of: <ul style="list-style-type: none"><li>• \$10 per month</li><li>• 50% of the final earnings</li><li>• The accrued benefit, reduced actuarially for early commencement and the joint and 100% survivor form.</li></ul>
<i>Unmarried or not eligible for early retirement:</i>	A lump sum of 50% of final earnings.

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## **Summary of Legislative Changes**

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## **SUMMARY OF MAJOR LEGISLATIVE CHANGES**

County Council Bill No. 36-89:

Effective 7/1/89.

Pension benefits and vesting provisions were improved. The accrual percentage per year of service was increased from 1.8% to 2.0%, permitting accrual of the maximum 60% benefit in 30 years instead of 33-1/3.

Full vesting was granted after 5 years of service. The old provisions used a graded scale granting 75% vesting after 10 years, climbing to 100% vesting after 15 years.

County Council Bill No. 34-92:

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

Participants age 50 or older with at least 20 years of service could elect to retire with an additional pension equal to 1/12 of 2% for each year of credited 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.

**SUMMARY OF MAJOR LEGISLATIVE CHANGES**

*(continued)*

County Council Bill No. 82-94:

Effective 10/31/94.

Transfers assets from general employees plan to A&E plan for participants who have transferred between these two plans.

County Council Bill No. 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.

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 60% cap. Normal Retirement was changed to the earlier of 30 years of service or age 60.

**SUMMARY OF MAJOR LEGISLATIVE CHANGES**

*(continued)*

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.

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. 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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## **Summary of Plan Funding**

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**SUMMARY OF PLAN FUNDING**

**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>
01/01/2005	\$395,501,876	\$ 9,669,948	\$405,171,824	97.6%	\$103,105,736	9.4%
01/01/2006	\$422,234,496	\$16,997,830	\$439,232,326	96.1%	\$107,290,189	15.8%
01/01/2007	\$456,656,849	\$25,314,781	\$481,971,630	94.7%	\$116,709,102	21.7%
01/01/2008 <sup>1</sup>	\$492,788,674	\$20,144,823	\$512,933,497	96.1%	\$117,222,681	17.2%
01/01/2008 <sup>2</sup>	\$492,788,674	\$33,552,808	\$526,341,482	93.6%	\$117,222,681	28.6%
01/01/2009	\$488,275,803	\$79,919,177	\$568,194,980	85.9%	\$124,803,488	64.0%
01/01/2010	\$519,556,093	\$79,285,038	\$598,841,131	86.8%	\$126,030,706	62.9%
01/01/2011 <sup>3</sup>	\$550,786,200	\$76,483,387	\$627,269,587	87.8%	\$123,498,129	61.9%
01/01/2011 <sup>4</sup>	\$522,165,144	\$105,104,443	\$627,269,587	83.2%	\$123,498,129	85.1%
01/01/2012	\$516,070,401	\$137,582,657	\$653,653,058	79.0%	\$120,415,534	114.3%
01/01/2013 <sup>1</sup>	\$508,232,321	\$173,188,445	\$681,420,766	74.6%	\$116,024,717	149.3%
01/01/2013 <sup>2</sup>	\$508,232,321	\$185,348,354	\$693,580,675	73.3%	\$116,024,717	159.7%
01/01/2014 <sup>1</sup>	\$545,812,384	\$169,560,860	\$715,373,244	76.3%	\$115,809,426	146.4%
01/01/2014 <sup>2</sup>	\$545,812,384	\$189,916,649	\$735,729,033	74.2%	\$115,809,426	164.0%
01/01/2015	\$582,795,438	\$198,310,522	\$781,105,960	74.6%	\$127,090,869	156.0%

**Schedules of County's Contributions**

<b><i>Year Ended December 31</i></b>	<b><i>Annual Required Contribution</i></b>	<b><i>Actual Contribution</i></b>	<b><i>Percentage Contributed</i></b>
2014	\$24,426,165	\$24,451,074 <sup>5</sup>	100.1%

<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.

**SUMMARY OF PLAN FUNDING**

*(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 19 to 28 years with an average effective period of 25 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



### **RISK METRICS**

The required contributions will vary over time based on the experience of the plan's investments and participants. As the value of the plan's assets and liabilities increase relative to the participant payroll, there is a greater risk of large changes to the required contribution expressed as a percentage of participant payroll.

The Asset Volatility Ratio (AVR) is equal to the market value of assets (MVA) divided by payroll. A higher AVR implies that the plan is exposed to greater contribution volatility. The current AVR of 4.6 indicates that a 1% asset gain/loss can be related to about 4.6% of the annual payroll. The plan currently amortizes asset gains/losses over a period of 20 years. This would result in a change in the required contribution of about 0.3% of payroll for each 1.0% change in market assets.

The Liability Volatility Ratio (LVR) is equal to the Actuarial Accrued Liability (AAL) divided by payroll. A higher LVR implies that the plan is exposed to greater contribution volatility due to changes in liability measurements. The current LVR of 6.1 indicates that a 1% liability gain/loss can be related to about 6.1% of the annual payroll. The plan currently amortizes liability gains/losses over a period of 20 years. This would result in a change in the required contribution of about 0.4% of payroll for each 1.0% change in AAL. As the plan approaches a 100% funded level, the AVR will converge to the LVR.

#### **Historical Volatility Ratios**

	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>AVR</b>	2.9	3.3	3.8	3.9	4.5	4.9	4.6
<b>LVR</b>	4.6	4.8	5.1	5.4	6.0	6.2	6.1

## **ACTUARIAL CERTIFICATION**

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the Anne Arundel County Employees' 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**

*(continued)*

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 or the reliance upon this report by any other party.

## **ACTUARIAL CERTIFICATION**

*(continued)*

The only purpose of this report is to:

- Provide the recommended employer contribution for fiscal year beginning July 1, 2015.

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**

*(continued)*

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, FSA, EA