THE ANNE ARUNDEL COUNTY
POLICE SERVICE
RETIREMENT PLAN

ACTUARIAL VALUATION
AS OF
JANUARY 1, 2015

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

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BOLTON PARTNERS

April 10, 2015

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

Re: Police Service Retirement Plan Valuation

Dear Andrea:

The following report sets forth the actuarial valuation as of January 1, 2015 of the Anne Arundel County Police 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, 2014 was $479,987,860. The average investment return for the year ended December 31, 2014 was 4.7% on a market value basis and 8.4% 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 $481,633,710. Details of the development of the actuarial value of assets are set forth later in this report.

PLAN PROVISION CHANGES

This valuation report reflects the change to a 7.25% Employee Contribution percentage for all plan participants pursuant to Bill No. 30-12 and Bill No. 67-12.

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.

The total recommended employer contribution for the plan year and fiscal year ending June 30, 2016 increased from $18,805,398 to $20,314,505. This is in addition to employee contributions of 7.25% for all employees. The contribution increased in dollars because of a 15.7% 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	45.1%
Investment Gain	(0.3%)
Pay Increases	0.2%
New Entrants/Change in Normal Cost	(1.6%)
Expenses	(0.2%)
COLA increases less than expected	(0.4%)
Demographics and Other Changes	(0.7%)
January 1, 2015 valuation	42.1%

The overall funded ratio for the plan based on the actuarial value of assets increased from 78.4% to 78.5%. Currently the market value of assets of $480 million is $2 million less than the actuarial value of the assets ($482 million). This difference of $2 million represents deferred investment losses that will be recognized in future valuations. In the prior valuation, there were $14 million in deferred gains.

We have introduced on page 20 a new "Risk Metrics" sheet. This shows interesting trends and the impact of the 15.7% increase in covered payroll.

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

K. Seets

Kristopher E. Seets, FSA, EA

David W. Ballard, CEBS

Trust Fund Asset Statement

TRUST FUND ASSET STATEMENT FOR YEAR ENDED DECEMBER 31, 2014

Original Market Value 1/1/2014	$	464,492,352
Audit Adjustment	$	0
Market Value 1/1/2014	$	464,492,352
Receipts:		
Employer Contributions	$	18,880,458
Employee Contributions		2,925,099
Interest and Dividends		11,401,125
Stock Loan Income		29,543
Realized and Unrealized Gain/(Loss)		9,461,651
Other		3,956,759
Total Receipts:	$	46,654,635
Disbursements:		
Benefit Payments	$	29,507,190
Administrative Expenses		417,781
Investment Expenses		3,036,296
Total Disbursements	$	32,961,268
Net Increase/(Decrease)	$	13,693,367
Preliminary Ending Value 12/31/2014	$	478,185,719
Contribution Receivable	$	1,802,141
Ending Value 12/31/2014	$	479,987,860

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

Development of Actuarial Value of Assets

ACTUARIAL VALUE OF ASSETS

		2013	2014
1.	**MVA Beginning of Year**	**$431,818,140**	**$466,280,524**
2.	Contributions	20,425,629	21,819,525
3.	Benefit Payments	26,941,861	29,507,190
4.	Administrative Expenses	583,020	417,781
5.	Expected 8%/7.5% Return	34,261,481	34,667,085
6.	**Expected Asset Value** (1. + 2. – 3. – 4. + 5.)	**$458,980,369**	**$492,842,162**
7.	Market Value End of Year	$466,280,524	$479,987,860
8.	**Asset Gain/(Loss)** (7. – 6.)	**$7,300,155**	**($12,854,302)**
9.	80% of 2013 Gain/(Loss) of $7,300,155	$5,840,124	
10.	60% of 2012 Gain/(Loss) of $21,773,869	$13,064,321	
11.	40% of 2011 Gain/(Loss) of ($22,260,246)	($8,904,098)	
12.	20% of 2010 Gain/(Loss) of $21,021,855	$4,204,371	
13.	**Actuarial Value of Assets 1/1/2014**	**$452,075,806**	
14.	80% of 2014 Gain/(Loss) of ($12,854,302)		($10,283,442)
15.	60% of 2013 Gain/(Loss) of $7,300,155		$4,380,093
16.	40% of 2012 Gain/(Loss) of $21,773,869		$8,709,548
17.	20% of 2011 Gain/(Loss) of ($22,260,246)		($4,452,049)
18.	**Actuarial Value of Assets 1/1/2015**		**$481,633,710**

Rate of Return on Actuarial Value of Assets *(net of investment expenses)*	**9.1%**	**8.4%**

Participant Summary

PARTICIPANT SUMMARY

	Active Participants	DROP	Inactive Participants: With Deferred Benefits	Inactive Participants: Receiving Benefits	Total
Participants as of January 1, 2014	608	58	0	639	1,305
Retired	(5)	(10)	0	15	0
Terminated Non-Vested	(13)	0	0	0	(13)
Disabled	(5)	0	0	5	0
Deceased	0	0	0	(13)	(13)
Payment to Beneficiary	0	0	0	6	6
Rehires	0	0	0	0	0
QDRO Put in Pay	0	0	0	2	2
Transfers Out	(1)	0	0	0	(1)
Transfers In	2	0	0	0	2
New Hires	59	0	0	0	59
Entered DROP	(7)	7	0	0	0
Data Adjustment	0	0	0	1	1
Net Change	30	(3)	0	16	43
Participants as of January 1, 2015	638	55	0	655	1,348

Service - Age Distribution

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	25 44,156	20 46,850	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	45 45,353
25-29	21 44,156	72 48,462	36 56,804	0 0	0 0	0 0	0 0	0 0	0 0	0 0	129 50,089
30-34	7 43,973	22 49,425	69 61,236	17 64,977	0 0	0 0	0 0	0 0	0 0	0 0	115 58,479
35-39	3 43,728	3 48,127	18 61,853	44 70,863	19 79,001	0 0	0 0	0 0	0 0	0 0	87 69,056
40-44	1 44,156	1 48,720	16 65,931	23 69,368	63 82,211	8 98,662	0 0	0 0	0 0	0 0	112 77,784
45-49	2 44,156	4 56,980	5 64,613	9 70,953	42 86,181	36 99,357	5 102,414	0 0	0 0	0 0	103 87,246
50-54	0 0	1 48,720	5 67,651	4 75,528	11 80,538	6 101,169	8 106,058	0 0	0 0	0 0	35 86,585
55-59	0 0	1 50,180	2 72,272	1 83,747	2 80,964	2 88,845	0 0	1 91,512	1 101,939	0 0	10 81,154
60-64	0 0	0 0	0 0	0 0	1 88,845	1 96,088	0 0	0 0	0 0	0 0	2 92,466
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	59 44,113	124 48,657	151 61,221	98 69,821	138 82,874	53 98,999	13 104,656	1 91,512	1 101,939	0 0	638 67,336

Excludes DROP participants

Average Age: 37.18

Average Service: 10.57

Average Salary: $67,336

Actuarial Costs

ACTUARIAL COSTS

	As of 01/01/2014	As of 01/01/2015
Participants		
Active excluding DROP	608	638
Active DROP	58	55
Retirees and Beneficiaries	639	655
Total	1,305	1,348
Active Payroll (Rate at January 1st including DROP)	$ 41,714,302	$ 48,261,635
1. Actuarial Liability		
Active Participants	$ 211,434,692	$ 231,934,063
Participants Receiving Benefits	364,953,146	381,682,950
Total	$ 576,387,838	$ 613,617,013
2. Actuarial Value of Assets	$452,075,806	$ 481,633,710
3. Unfunded Actuarial Liability (1-2)	$124,312,032	$ 131,983,303
4. County's Normal Cost	$ 9,352,929	$ 10,068,553
5. Amortization Payment	$ 7,623,464	$ 8,328,661
6. Estimated Expenses	$ 517,000	$ 500,000
7. Total Recommended Contributions as of January 1st (4 + 5 + 6)	$ 17,493,393	$ 18,897,214
8. Total Recommended Contribution as of December 31st (7 x 1.075)	$ 18,805,398	$ 20,314,505
9. Contribution as a % of total payroll	45.1%	42.1%

UNFUNDED LIABILITY AMORTIZATION SCHEDULE

	Amortization Period			Balances		
	Date	Initial	Years			2015
Charge	Created	Years	Left	Initial	Outstanding	Payment
Unfunded Accrued Liability	01/01/2004	30	19	$14,184,341	$15,850,145	$ 1,192,816
Actuarial Loss	01/01/2006	30	21	$ 7,107,916	$ 7,900,564	$ 558,070
Actuarial Loss	01/01/2008	30	23	$ 3,994,073	$ 4,378,419	$ 292,780
Assumption Change	01/01/2008	30	23	$ 413,838	$ 453,656	$ 30,336
Actuarial Loss	01/01/2009	30	24	$38,806,777	$42,133,294	$ 2,748,664
Asset Method Change	01/01/2011	30	26	$23,432,153	$24,839,582	$ 1,549,538
Actuarial Loss	01/01/2012	30	28	$28,771,315	$30,074,681	$ 1,838,386
Assumption Change	01/01/2013	30	28	$ 4,798,658	$ 4,940,099	$ 296,267
Actuarial Loss	01/01/2013	30	28	$32,647,498	$33,609,786	$ 2,015,643
Assumption Change	01/01/2014	20	19	$6,690,483	$ 6,668,500	$ 501,844
Actuarial Loss	01/01/2015	20	20	$6,543,093	$ 6,543,093	$ 476,494
Credits						
Actuarial Gain	01/01/2005	30	20	$ 5,392,880	$ 6,017,292	$ 438,203
Actuarial Gain	01/01/2007	30	22	$ 4,732,240	$ 5,228,687	$ 359,007
Actuarial Gain	01/01/2010	30	25	$ 906,991	$ 973,744	$ 62,073
Actuarial Gain	01/01/2011	30	26	$13,538,002	$14,351,150	$ 895,250
Actuarial Gain	01/01/2014	20	19	$18,899,742	$18,837,643	$ 1,417,644
Net Total					$131,983,303	$ 8,328,661

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 $8,328,661 is not sufficient to cover the interest on the plan's unfunded liability, the unfunded liability is expected to grow for an initial period.

Assumptions and Methods

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 fees.
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.
Mortality (Eff. 1/1/2013):	*Healthy:* RP-2000 Blue Collar Mortality Table projected generationally using scale AA. Pre-Termination mortality uses 60% of these rates. *Disabled:* RP-2000 Blue Collar Mortality Table set forward five years and then projected generationally using scale AA. 100% of pre-retirement deaths are assumed to be non-duty-related.

ASSUMPTIONS AND METHODS

(continued)

Salary Increases:

The following graded schedule is used:

Attained Age	% Increase at Attained Age
20	6.0%
25	6.0%
30	5.5%
35	5.0%
40	4.5%
45	4.0%
50	4.0%

Disability:

Sample rates are:

Age	Rate
30	0.3060%
35	0.4526%
40	0.9340%
45	1.5619%
50	2.2983%
55	0.0000%

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

Turnover:

Sample rates are:

Age	Rate
20	5.31%
25	4.25%
30	3.19%
35	2.13%
40	1.28%
45	0.64%
50	0.00%

ASSUMPTIONS AND METHODS
(continued)

Retirement: Retirement rates are as follows:

Age Group	Years of Service					
	< 20	20	21-23	24	25-29	30+
38-44	0%	26.40%	10%	18.33%	10%	10%
45-49	0%	18.34%	10%	18.33%	10%	10%
50	30%	36.66%	50%	58.33%	50%	100%
51-52	10%	14.66%	20%	28.33%	20%	100%
53	10%	22.00%	20%	28.33%	20%	100%
54	10%	22.00%	20%	36.67%	20%	100%
55	50%	50%	50%	50%	50%	100%
56-57	30%	30%	30%	30%	30%	100%
58	100%	100%	100%	100%	100%	100%

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

Sample Load Rates

Age	Service 23	27	30	35
44	0.4%	1.4%	2.3%	12.0%
50	2.0%	3.7%	4.5%	14.6%
55	2.7%	4.6%	5.4%	15.6%
60	3.2%	5.3%	6.1%	16.4%

Disability Leave: Active liabilities (which depend on credit service) are loaded by 1.75% to account for future crediting of disability service.

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

Marriage (Eff. 1/1/2013): 80% of employees and 70% of current retired and disabled members are assumed married. Males are assumed to be four years older than their spouses.

ASSUMPTIONS AND METHODS
(continued)

CIGNA Benefit:	Our calculations reflect that some benefits have already been purchased.
Other Methods and Assumptions:	Administrative Expenses are \$517,000 for FY2015 and \$500,000 for FY2016 (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.

Plan Provisions

PLAN PROVISIONS

Normal Retirement:	For those hired prior to February 25, 2002: 20 years of service or age 50. For those hired on or after February 25, 2002: 20 years of service, or age 50 with 5 years of service.
Normal Form of Benefit:	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.
Cost of Living Increase (for benefits accrued as of 1/31/97):	Retiree benefits are adjusted each year. The revised benefit amount is the lesser of: a. Base benefit multiplied by ratio of current 12 month average CPI to 12 month average CPI at retirement. b. Prior year benefit increased by 4%.
Cost of Living Increase (for benefits accrued after1/31/97):	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. Prior year benefit increased by 2.5%.
Employee Contributions:	7.25% of pay rate for all employees.
Compensation:	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.
Final Earnings:	The average of the highest 3 years of annual basic pay.

PLAN PROVISIONS
(continued)

Benefit Formula:	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).
Termination Prior to Retirement:	At less than 20 years of service, return of employee contributions with 3% interest.
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:	The greater of the accrued benefit or 20% of final earnings, payable immediately, unreduced.
Pre-Retirement Spouse's Benefit:	
Line of Duty Death Benefit:	Greater of accrued benefit or 66 2/3% of final earnings.
Non-Line of Duty Death Benefit:	Accrued benefit.
Other Pre-Retirement Death Benefits:	Return of employee contributions with 3% interest.
Deferred Retirement Option Program (DROP):	Allows accumulation of pension after 20 years of County service. DROP period must be between 3 and 5 years. Members may remain in DROP for a 6th year, but no interest shall be credited to the DROP account in the 6th year.

Summary of Legislative Changes

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 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.
County Council Bill No. 66-92:	Effective 7/2/92. The plan was amended to allow normal, unreduced retirement after 20 years of service. Employee contributions were increased to 6% from 5%. Participants under age 50 were not allowed to retire and receive retirement incentives (under Bill No. 34-92) in addition to unreduced retirement. They could either retire early with the incentives, or normally without the incentives.
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).

SUMMARY OF MAJOR LEGISLATIVE CHANGES
(continued)

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.
County Council Bill No. 80-00/ 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 66-05:	Effective 10/10/2005. Reduced the contribution percentage for Category II participants from 6% to 5%.
County Council Bill 58-07:	Effective 10/11/2007. Reduced the contribution percentage for Category I participants from 6% to 5%.

SUMMARY OF MAJOR LEGISLATIVE CHANGES

(continued)

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 average basic pay. Clarified the limits on those entering DROP. The effective annual interest rate for the DROP account changed from 8% to 4.25% for those entering DROP on or after July 1, 2009.
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. Increased the contribution rate for Police Officers, Police Officer First Class, Police Corporals, and Police Sergeants to 7.25%.
County Council Bill No. 30-12:	Effective 2/1/2013 All participants except for those in the Police Lieutenant classification shall contribute 7.25% of his or her annual basic pay in each calendar year or portion of a calendar year while an active participant is in the plan.
County Council Bill No. 67-12:	Effective 2/1/2013 Participants in the Police Lieutenant classification shall contribute 7.25% of his or her annual basic pay in each calendar year or portion of a calendar year while an active participant in the plan.

Summary of Plan Funding

SUMMARY OF PLAN FUNDING

Schedules of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Unfunded AAL (UAAL) (b - a)	Actuarial Accrued Liability (AAL) (b)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b - a)/c)
01/01/2005	$337,113,153	$ 9,041,000	$346,154,153	97.4%	$33,530,370	27.0%
01/01/2006	$360,268,341	$16,292,562	$376,560,903	95.7%	$36,694,307	44.4%
01/01/2007	$389,877,885	$11,820,220	$401,698,105	97.1%	$37,805,038	31.3%
01/01/2008[1]	$417,278,055	$15,975,209	$433,253,264	96.3%	$41,011,366	39.0%
01/01/2008[2]	$417,278,055	$16,389,047	$433,667,102	96.2%	$41,011,366	40.0%
01/01/2009	$408,261,502	$55,419,694	$463,681,196	88.0%	$41,508,547	133.5%
01/01/2010	$432,176,036	$55,393,143	$487,575,178	88.6%	$42,499,380	130.4%
01/01/2011[3]	$459,323,278	$42,678,391	$502,001,669	91.5%	$42,449,204	100.5%
01/01/2011[4]	$435,891,125	$66,110,544	$502,001,669	86.8%	$42,449,204	155.7%
01/01/2012	$430,342,941	$95,812,037	$526,154,978	81.8%	$41,334,580	231.8%
01/01/2013[1]	$420,675,703	$129,817,736	$550,493,439	76.4%	$40,521,944	320.4%
01/01/2013[2]	$420,675,703	$134,616,394	$555,292,097	75.8%	$40,521,944	332.2%
01/01/2014[1]	$452,075,806	$117,621,549	$569,697,355	79.4%	$41,714,302	282.0%
01/01/2014[2]	$452,075,806	$124,312,032	$576,387,838	78.4%	$41,714,302	298.0%
01/01/2015	$481,633,710	$131,983,303	$613,617,013	78.5%	$48,261,635	273.5%

Schedules of County's Contributions

Year Ended December 31	*Annual Required Contribution*	*Actual Contribution*	*Percentage Contributed*
2014	$18,869,731	$18,869,736[5]	100.0%

[1] Prior to Assumption Changes
[2] After Assumption Changes
[3] Prior to Asset Method Change
[4] After Asset Method Change
[5] 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 9.9 indicates that a 1% asset gain/loss can be related to about 9.9% 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 0.7% 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 12.7 indicates that a 1% liability gain/loss can be related to about 12.7% 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 0.9% 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

	2009	2010	2011	2012	2013	2014	2015
AVR	7.4	8.2	9.2	9.4	10.6	11.1	9.9
LVR	11.2	11.5	11.8	12.7	13.7	13.7	12.7

ACTUARIAL CERTIFICATION

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the Anne Arundel County Police 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

(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