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

ACTUARIAL VALUATION
AS OF
JANUARY 1, 2008

Bolton Partners, Inc. 575 South Charles Street Suite 500 Baltimore, Maryland 21201

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April 10, 2008

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, 2008 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 as 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, 2007 was \$78,543,019. The average investment return for the fund on a market basis for the year ended December 31, 2007 was 10.4% and 8.9% 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, 2007, the actuarial value of assets was \$74,355,736. Details of the development of the actuarial value of assets are set forth later in this report.

ASSUMPTION CHANGES

The following assumptions were changed pursuant to the recently completed Experience Study:

- Decreased termination rates after age 25.
- Increased disability rates at all ages.
- Adopting the RP-2000 Blue Collar Mortality Table projected to 2008 (by male scale AA).
- Increased salary scale after age 35.

PRINCIPAL RESULTS

The principal purpose of the valuation is to set forth the County's contributions for the fiscal year ending June 30, 2009. In addition, the report sets forth the information on the plan for the County's financial statements and for the plan's own financial statements.

The total recommended employer contribution for the plan year and fiscal year ending June 30, 2009 increased from \$3,557,116 to \$4,019,403. This is in addition to employee contributions of 5% of pay for the Detention Center employees and deputy sheriffs. The increase can be broken down to the following material factors:

- On an actuarial basis the investment return was 8.9% and generated a large investment gain. On a market value basis the return was 10.4%. The difference between 10.4% and 8.9% is a deferred gain. The amount of the deferred gain increased from \$2.9 million to \$4.2 million.
- Salary increases were slightly higher than the assumption.

The above material factors had the following effect on the County's contribution (as a percentage of payroll) since last year's valuation.

January 1, 2007 valuation	20.5%
Pay Increases	0.1%
Investment Gain	(0.5%)
New Entrants/Change in Normal Cost	0.2%
COLAs	(0.1%)
Retiree Data Correction	0.2%
Assumption Changes	1.5%
Demographics and Other Changes	0.3%
January 1, 2008 valuation	22.2%

The overall funded ratio for the plan decreased from 87.2% to 83.7%.

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

Trust Fund Asset Statement

TRUST FUND ASSET STATEMENT FOR YEAR ENDED DECEMBER 31, 2007

Original Market Value 1/1/2007	\$69,136,252
Audit Adjustment	\$ 0
Market Value 1/1/2007	\$69,136,252
Receipts:	
Employer Contributions Employee Contributions Interest and Dividends Realized and Unrealized Gain/(Loss) Other	\$ 3,608,191 879,245 2,505,869 4,983,185 84,137
Total Receipts:	\$12,060,627
Disbursements:	
Benefit Payments Administrative Expenses Investment Expenses	\$ 2,644,842 85,476 290,394
Total Disbursements	\$ 3,020,712
Net Increase/(Decrease)	\$ 9,039,914
Preliminary Ending Value	\$78,176,166
Contribution Receivable	\$ 366,853
Ending Value 12/31/2007	\$78,543,019

Development of Actuarial Value of Assets

ACTUARIAL VALUE OF ASSETS

 Actuarial Value of Assets Beginning of Year Contributions Benefit Payments Administrative Expenses Expected 8% Return Expected Asset Value (1. + 2 3 4. + 5.) Market Value End of Year Prior Deferred Gain/(Loss) Asset Gain/(Loss) (7 8 6.) 	2006 \$58,379,332 4,289,306 2,112,242 69,721 4,754,640 \$65,241,315 \$69,136,252 \$789,805 \$3,105,132	2007 \$66,233,757 4,487,436 2,644,842 85,476 5,368,985 \$73,359,860 \$78,176,166 \$1,671,190 \$3,145,116
 80% of 2006 Gain/(Loss) of \$3,105,132 60% of 2005 Gain/(Loss) of \$(705,993) 40% of 2004 Gain/(Loss) of \$452,540 20% of 2003 Gain/(Loss) of \$5,161,923 Preliminary Actuarial Value of Assets 1/1/2007 (7 10 11 12 13.) Contributions Receivable and Adjustment Actuarial Value of Assets 1/1/2007 (14. + 15.) 	\$ 2,484,106 (423,596) 181,016 1,032,385 \$65,862,341 \$ 371,416 \$66,233,757	
 80% of 2007 Gain/(Loss) of \$3,145,116 60% of 2006 Gain/(Loss) of \$3,105,132 40% of 2005 Gain/(Loss) of \$(705,993) 20% of 2004 Gain/(Loss) of \$452,540 Preliminary Actuarial Value of Assets 1/1/2008 (7 17 18 1920.) Contributions Receivable Actuarial Value of Assets 1/1/2008 (21. + 22.) 		\$ 2,516,093 1,863,079 (282,397) 90,508 \$73,988,883 366,853 \$74,355,736
Rate of Return on Actuarial Value of Assets (net of investment expenses)	9.0%	8.9%

Participant Schedules

PARTICIPANT SUMMARY

		Inactive Pa	rticipants	
	Active Participants	With Deferred Benefits	Receiving Benefits	<u>Total</u>
Participants as of January 1, 2007	359	15	106	480
Retired	(9)	0	9	0
Terminated	(17)	1	0	(16)
Disabled	(2)	0	2	0
Deceased/Payment Expired	0	0	0	0
Lump Sum	0	0	0	0
Rehired	0	0	0	0
Transfers in from:				
Fire	0	0	0	0
Police	0	0	0	0
Employee	2	0	0	2
Transfers out to:				
Fire	0	0	0	0
Police	0	0	0	0
Employee	0	0	0	0
New Hires	24	0	0	24
New QDRO	0	0	0	0
Data Adjustment	0	0	2	2
Net Change	(2)	1	13	12
Participants as of January 1, 2008	357	16	119	492

Service - Age Distribution

AGE, SERVICE AND AVERAGE SALARY DISTRIBUTION

Age as of 1/1/2007	Under 1	01-04	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40 +	Total
Under 25	2	13	0	0	0	0	0	0	0	0	15
	37,118	38,781	0	0	0	0	0	0	0	0	38,559
25-29	6	6	2	0	0	0	0	0	0	0	14
	39,070	40,427	43,766	0	0	0	0	0	0	0	40,322
30-34	2	14	21	8	0	0	0	0	0	0	45
	42,160	41,383	46,168	50,552	0	0	0	0	0	0	45,281
35-39	2	12	27	24	4	0	0	0	0	0	69
	40,762	40,202	45,546	54,453	61,789	0	0	0	0	0	48,518
40-44	5	6	9	24	11	1	0	0	0	0	56
	42,534	41,929	47,971	54,824	62,170	80,338	0	0	0	0	53,142
45-49	2	9	14	19	19	2	4	0	0	0	69
	39,999	40,633	45,474	54,652	67,643	66,242	70,632	0	0	0	55,376
50-54	3	5	9	16	4	1	4	2	0	0	44
	52,666	41,442	47,807	53,669	69,172	76,101	74,904	72,858	0	0	55,734
55-59	2	4	11	7	1	0	0	1	0	0	26
	42,160	44,290	45,761	69,836	54,931	0	0	73,984	0	0	53,178
60-64	0	1	8	8	1	0	0	0	0	0	18
	0	40,541	46,322	54,976	55,530	0	0	0	0	0	50,359
35-69	0	0	0	1	0	0	0	0	0	0	1
Ì	0	0	0	55,937	0	0	0	0	0	0	55,937
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	24	70	101	107	40	4	8	3	0	0	357
	42,062	40,724	46,133	55,222	65,085	72,231	72,768	73,233	0	0	50,763

Average Age:

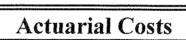
43.19

Average Service:

9.16

Average Salary:

\$50,763



ACTUARIAL COSTS

Doutiningsto	As of <u>01/01/2007</u>	As of <u>01/01/2008</u>
Participants Active	359	257
Inactive		357 125
Total	121 480	135 492
Total	460	492
Active Payroll (Rate at January 1 st)	\$17,367,873	\$18,122,458
1. Accrued Liabilities		
Active Participants	\$45,850,909	\$50,061,543
Participants Receiving Benefits	29,316,260	37,779,888
Participants with Deferred Benefits	779,067	954,120
Total	\$75,946,236	\$88,795,551
	, ,	, , ,
2. Actuarial Value of Assets	\$66,233,757	\$74,355,736
3. Unfunded Actuarial Liability	\$ 9,712,479	\$14,439,815
4. County's Normal Cost	\$ 2,618,055	\$ 2,756,329
•		
5. Amortization Payment	\$ 600,571	\$ 887,340
6. Estimated Expenses	\$ 75,000	\$ 78,000
7. Total Recommended Contributions as of January 1 st	\$ 3,293,626	\$ 3,721,669
0 T-+1 P	0.0557116	ф. 4.010.403
8. Total Recommended Contribution as of December 31 st	\$ 3,557,116	\$ 4,019,403
9. Contributions as a Percentage of Payroll	20.48%	22.18%

UNFUNDED LIABILITY AMORTIZATION SCHEDULE

		rtization P		Bala	nces	2000
Charge	Date <u>Created</u>	Initial <u>Years</u>	Years <u>Left</u>	<u>Initial</u>	Outstanding	2008 Payment
Unfunded Accrued	01/01/0000	20	2.5	***	.	
Liability	01/01/2003	30	25	\$8,245,799	\$ 8,895,065	\$565,909
Actuarial Loss	01/01/2005	30	27	\$ 780,906	\$ 820,194	\$ 50,030
Actuarial Loss	01/01/2006	30	28	\$1,772,183	\$ 1,833,161	\$109,699
Plan and Assumption	n					
Change	01/01/2006	30	28	\$ 744,267	\$ 769,877	\$ 46,070
Actuarial Loss	01/01/2008	30	30	\$3,220,741	\$ 3,220,741	\$186,109
Assumption	01/01/0000	•	•			
Change	01/01/2008	30	30	\$1,378,213	\$ 1,378,213	\$ 79,640
Total					\$16,917,251	\$1,037,457
	Amoi Date	rtization Po Initial	eriod Years	Bala	nces	2008
Credit	Created	Years	Left	<u>Initial</u>	Outstanding	Payment
Actuarial Gain and						
Assumption Change	01/01/2004	30	26	\$1,216,481	\$ 1,295,725	\$ 80,664
Actuarial Gain	01/01/2007	30	29	\$1,161,281	\$ 1,181,711	\$ 69,453
Total					\$ 2,477,436	\$150,117
Net					\$14,439,815	\$887,340

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

Assumptions and Methods

ASSUMPTIONS AND METHODS

Funding Method: Projected U

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.

Salary Increases:

The following graded schedule is used:

% Increase at
Attained Age
6.50%
6.50%
6.00%
5.75%
5.25%
4.75%
4.75%

ASSUMPTIONS AND METHODS

(continued)

Mortality:

Healthy: RP-2000 Blue Collar Mortality Table projected to

2008 (by Male Scale AA).

Disabled: RP-2000 Blue Collar Mortality Table projected

to 2008 (by Male Scale AA), set forward five years.

Disability:

Sample rates are:

<u>Age</u>	<u>Rate</u>
30	0.144%
35	0.213%
40	0.440%
45	0.735%
50	1.082%
55	0.000%

10% of disablement is assumed to be duty-related.

Turnover:

Sample rates are:

-	Ra	ate
<u>Age</u>	<u>Males</u>	<u>Females</u>
20	12.38%	18.75%
25	8.98%	14.06%
30	6.81%	11.25%
35	4.95%	8.44%
40	3.41%	6.19%
45	1.86%	3.94%
50	0.00%	0.00%
55	0.00%	0.00%

Retirement (Category II):

Age/Service	Annual Rate
At 20 years of service	5%
Between 20 years and age 50	2%
50	30%
51 – 59	20%
60	100%

Rate is 100% after age 50 if at least 30 years of actual County service has been accrued.

ASSUMPTIONS AND METHODS

(continued)

Retirement (Category I):	Sample Service Rates					
•	Age	20	22	24	<u>27</u>	<u>30</u>
	40	25%	10%	$\frac{10}{6}$	10%	10%
	45	25%	10%	10%	10%	10%
	50	50%	50%	50%	50%	100%
	55	100%	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:	It is assumed that 85% of employees who die are married and males are four years older than their spouses.					
Death:	100% of deaths are assumed to be non-duty-related.					
Other Methods and Assumptions:	Administrative Expenses are \$78,000 for FY2009 and \$75,000 for FY2008 (average of actual expenses for the two years preceding the valuation date).					
Valuation Procedures:	Since cost of the retired lial for benefits a 1.75% to acc benefits accru	oilities of ccrued be ount for	the plan efore Bi mid-yea	determi ll 88-96 ar increa	ned as of were ind se. Lial	f January 1 creased by bilities for

to account for the mid-year increase.

Plan Provisions

PLAN PROVISIONS

Normal Retirement Age:

Category I Participants: 20 years of service, or age 50

with 5 years.

Category II Participants: Age 50 with 5 years of

service.

Normal Form of Benefit:

Monthly life annuity with payments guaranteed for 5

years.

Cost of Living Increase

(simple, for benefits accrued as of 1/31/97):

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 current CPI from CPI for prior year, or

b. Benefit increased by 4% of original benefit.

Cost of Living Increase

(compound, for benefits accrued after 1/31/97): 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. Benefit increased by 2.5%.

Employee Contributions:

5% of compensation.

Compensation:

Regular annual rate of pay, exclusive of extra

compensation of any kind such as overtime pay,

bonuses, and commissions.

Final Earnings:

The average of the highest 3 consecutive years of the

last 5 years of annual basic pays.

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)

PLAN PROVISIONS

(continued)

Early Retirement: Reduced benefits are available the first of any month

coincident with or next following the completion of

20 years of continuous service.

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 Benefit: 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 4.25% interest,

and a lump sum equal to 50% of annual pay.

Summary of Legislative Changes

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.

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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.

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. 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.

Statement No. 25 of the GASB

STATEMENT NO. 25 OF THE GOVERNMENTAL ACCOUNTING STANDARDS BOARD

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)
01/01/1998	\$18,096,275	\$4,104,819	\$22,201,094	81.5%	\$8,632,870	47.5%
01/01/1999	\$21,543,373	\$4,152,095	\$25,695,468	83.8%	\$9,570,569	43.4%
01/01/2000	\$27,204,448	\$5,473,313	\$32,677,761	83.3%	\$11,893,991	46.0%
01/01/2001	\$31,116,751	\$5,661,165	\$36,777,916	84.6%	\$12,302,830	46.0%
01/01/2002	\$34,742,230	\$5,711,531	\$40,453,761	85.9%	\$13,565,333	42.1%
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%
$01/01/2008^1$	\$74,355,736	\$13,061,602	\$87,417,338	85.1%	\$18,122,458	72.1%
$01/01/2008^2$	\$74,355,736	\$14,439,815	\$88,795,551	83.7%	\$18,122,458	79.7%

Schedules of County's Contributions

Year Ended December 31	Annual Required Contribution	Annual Contribution	Percentage Contributed	
2007	\$3,600,897	\$3,600,894 ³	100.0%	

Prior to Assumption Changes
 After Assumption Changes
 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 25 to 30 years with an

average of 28 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