Howard County, Maryland
Post-Employment Medical Benefits
Actuarial Valuation as Required by GASB 74

Fiscal Date: July 1, 2017 – June 30, 2018
Date of Report: October 30, 2018

Bolton

Submitted by:

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Employee Benefits, Actuarial & Investment Consulting

October 30, 2018

Janet R. Irvin
Director, Department of Finance
Howard County Government
3430 Court House Drive
Ellicott City, MD 21043

Dear Janet:

The following report contains the information that will be needed for the FYE 2018 OPEB disclosure under the GASB 74 accounting standard. Section 1 is meant to give a high level of summary of the OPEB valuation. Most of the information needed for the CAFR footnote is provided in Section 2 of the report. Section 3 summarizes the valuation data Section 4 – 6 the plan provisions, and Section 7 - 10 the actuarial methods and assumptions. The appendices of the report provide details on the derivation of the discount rate.

This report has been prepared for Howard County Government for the purposes of complying with the GASB 74 accounting standard. It is neither intended nor necessarily suitable for other purposes. Bolton Partners is not responsible for the consequences of any other use nor the reliance upon this report by any other party.

In general, post-employment medical valuations are based on an assumption for medical cost increases. Future medical care cost increase rates are unpredictable and could be volatile. They will depend upon the economy, future health care delivery systems and emerging technologies. The trend rate selected is based on an economic model developed by a health care economist for the Society of Actuaries. Future medical trend increases could vary significantly from the model. The report shows the impact of 1 percent (over all years) increase in the medical trend assumption. 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, applicable law or accounting rules.

The report is based on January 1, 2018 census data. The census data and medical premiums for fiscal year 2016 and 2017 were submitted by the County. We have not performed an audit on the data and have relied on this information for purposes of preparing this report.

The actuarial methods and assumptions used in this report comply with GASB 74 and the actuarial standards of practice promulgated by the American Academy of Actuaries.

Bolton Partners is completely independent of the Howard County, its programs, activities, or any of its officers or key personnel. We and anyone closely associated with us does not have any relationship which would impair our independence on this assignment.

Kevin Binder is a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

Respectfully submitted,

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Section I. Executive Summary

Background

In June 2015, the Government Accounting Standards Board (GASB) released Statements 74 and 75. GASB Statement 74 replaces Statement 43 for post-employment benefits other than pensions (OPEB) for *plan* accounting. GASB Statement 75 replaces Statement 45 for post-employment benefits other than pensions (OPEB) for *employer* accounting.

Under GASB 45 the Net OPEB Obligation was a liability on the Government's financial statements. Under GASB 75 the entire unfunded actuarial accrued liability is now on the Government's financial statements. There is no longer a Net OPEB Obligation. The annual expense is simply equal to the increase (decrease) in the unfunded actuarial accrued liability, however to minimize expense volatility some of the increase (decrease) is deferred.

OPEB Trust Arrangement

The County's OPEB plan is an Cost Sharing Employer Postemployment Healthcare Plan, with seven separate employers:

- The Primary Government (Howard County)
- The Howard County Public School System
- The Howard County Community College
- The Howard County Public Library
- The Howard County Economic Development Authority
- The Howard County Housing Commission
- Soil Conservation District.

The Mental Health Authority is being assumed by the State of Maryland effective June 30, 2018.

Funding Policy

It is our understanding that Howard County contributed $10,000,000 to the trust in FYE 2016, $13,000,000 in FYE 2017, and $16,000,000 in FYE 2018. We used the three-year average of $13,000,000 as an assumed contribution for FYE 2019. This 3-year average was used to project future plan contributions when determining the discount rate for the plan. These trust contributions are assumed to be in addition to benefit payments that are made from general revenues.

Section I. Executive Summary

Discount Rate Assumption

The discount rate used to measure the Plan's total OPEB liability is 3.94% on the measurement date for FYE 2017 (June 30, 2017). The discount rate on the measurement date for FYE 2018 (June 30, 2018) is 3.98%. The benefit payment stream for the Plan is discounted based on an index rate for 20-year tax exempt general obligation municipal bonds with an average rating of AA/Aa or higher for years when the projected benefit payouts are expected to be unfunded and 7.50% for years when the projected benefit payouts are expected to be funded. The included calculations assume that the members and the County will continue to make the current contribution levels increasing 3 percent per annum. GASB requires that we first allocate these contributions to the normal cost for future hires.

Please refer to the Appendix for the derivation of the discount rate.

Measurement Date

GASB 74 liabilities are calculated as of the last date of the plan year (June 30, 2018).

Section I. Executive Summary

Comparison with Previous Valuation

The following table reconciles the Net OPEB Liability from the previous valuation at 06/30/2017 to the current valuation at 6/30/2018.

Comparison of Current and Previous Valuations	
Net OPEB Liability as of 6/30/2017	$ 1,105,635,348
Passage of Time	51,149,896
Increase/(Decrease) due to Asset Experience	(763,334)
Demographic Experience	12,238,057
Claims Experience	(73,235,444)
Change in Medical Trend	(15,911,832)
Change in Decrement Assumptions	76,011,160
Change in Salary Scale	26,866,633
Change in Discount Rate to 3.98%	(9,254,046)
Net OPEB Liability as of 6/30/2018	**$ 1,172,736,438**

Section I. Executive Summary

Plan Provisions

There are separate plans for the County and Library, Schools, and College. Each has a subsidy schedule depending on the years of service at retirement. The County and Library subsidy does not depend upon the medical plan chosen by the retiree. For employees who retired prior to July 1, 2009, the County and Library pay a subsidy which is a percentage of the premium for the Aetna PPO plan. For employees who retired on or after July 1, 2009, the County and Library pay a subsidy which is a percentage of the premium for the Aetna HMO plan.

For participants who retired prior to July 2, 2010, the Schools provide a subsidy which is a percent of the premium for the medical plan selected by the retiree. For participants who retired on or after July 2, 2010, the Schools provide a subsidy which is a percent of the premium for the Aetna HMO plan.

The College offers a subsidy to retirees based on a percent of the premium for the medical plan chosen by the retiree.

In addition, the County and Library provide a subsidy for dependent spouses equal to 25% of the additional premium for spouse coverage for the lowest cost plan. The Schools and College do not subsidize spouse benefits. The Schools also provide a post-employment life insurance at no cost to retirees. There is no provision for post-employment life insurance for the County, Library, or College.

Please see Section 4, 5 and 6 for more details.

Demographic Data

Demographic data as of January 1, 2018 was provided to us by the Government, Library, Schools, and College. This data included current medical coverage for current employees and retirees.

Since the census data is less than 30 months before the last day of fiscal year 2018, it can be relied on to comply with GASB 74 for FYE 2018.

Although we have not audited this data, we have no reason to believe that it is inaccurate.

Claims Data

We used the published insurance rates provided by the County. Insurance rates provided were those in effect for calendar year 2017. We received paid claims and enrollment for Howard County Government, Library, School, and College Retirees from January 1, 2016 through December 31, 2017.

Although we have not audited the claims data, we have no reason to believe that it is inaccurate.

Section I. Executive Summary

Impact of Health Care Reform

We have adjusted the pre-65 medical care trend due to the projected impact of the “Cadillac Tax”. The Cadillac Tax is one of the provisions of the Affordable Care Act (ACA) of 2010. The Cadillac Tax provision is effective in 2022. The Cadillac Tax only applies to plans that cost $10,200 or more for an individual or $27,500 per family. There will be a 40 percent excise tax for expenditures over these thresholds. The cost thresholds are indexed by general inflation each year after 2018. Because medical trends are projected to be higher than general inflation we would expect the percentage of the premium that is subject to the premium tax to increase over time.

There are other provisions of the ACA that could impact future costs. Some of the provisions (for example risk adjustment charges for plans that cover healthier populations) could increase costs, while others (for example, less uninsured care costs might be passed on to those with insurance) may reduce costs over time. Since the impact of these provisions is unclear at this time, we have made no other adjustments to the medical care trend.

Implicit Subsidy

The published insurance rates for persons prior to Medicare eligibility are based primarily on the healthcare usage of active employees. Since retirees use healthcare at a rate much higher than employees, using these blended rates creates an implicit subsidy for the retiree group. GASB 74 requires that the claims assumption we use for this valuation be based on the actual per-capita retiree cost. The difference between the actual usage of healthcare by retirees and the assumption built into the published rates is identified as the implicit subsidy amount. The impact on rates can be seen in Section 8, 9 and 10. The liabilities could be reduced by publishing rates for retirees prior to Medicare eligibility that more closely reflect the true cost of healthcare for each group.

Demographic Assumptions

The demographic assumptions mirror those used for the pension plans. For County employees there are separate demographic assumptions for general, police, fire, and correction employees. School and College employees use the same assumptions as the State of Maryland Pension System.

These assumptions have been revised since the last valuation for the Schools and College Employees.

Section 8, 9, and 10 details the assumptions for electing coverage.

Section I. Executive Summary

Economic Assumptions

The medical trend assumption was developed using the Society of Actuaries (SOA) Long-Run Medical Cost Trend Model. The following assumptions were used as input variables into this model:

Rate of Inflation	2.2%
Rate of Growth in Real Income / GDP per capita	1.6%
Excess Medical Cost Growth	1.3%
Health Share of GDP Resistance Point	25.0%
Year for Limiting Cost Growth to GDP Growth	2075

The SOA Long-Run Medical Cost Trend Model and its baseline projection are based on an econometric analysis of historical U.S. medical expenditures and the judgments of experts in the field. The long-run baseline projection and input variables have been developed under the guidance of an SOA Project Oversight Group.

Actuarial Certification

In preparing the valuation we relied on demographic and claims data provided by Howard County. We reviewed the data for reasonableness but did not audit the data. The actuarial methods and assumptions used in this report comply with GASB 74 and the actuarial standards of practice promulgated by the American Academy of Actuaries.

Post-Employment medical valuations are based on an assumption for post-retirement medical increases. If medical costs increase at a rate different than our assumption there could be a dramatic change in the cost.

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. 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.

A change in assumptions does not indicate that the prior assumptions were invalid. At the time the prior assumptions were chosen, they represented our best estimate of the future experience of the plan. If we change assumptions in the future, it would be to align the assumptions with our then-current best estimate.

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.

Kevin Binder is a Member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report.

Section II. GASB 74 Disclosure

Change in Net OPEB Liability

	Total OPEB Liability (a)	Plan Fiduciary Net Position (b)	Net OPEB Liability (a) - (b)
Balance as of June 30, 2017 for FYE 2017	1,209,916,000	$104,280,652	1,105,635,348
Changes for the Year			
Service Cost	55,048,654		55,048,654
Interest	47,145,426		47,145,426
Changes of Benefit Terms	0		0
Experience Losses/(Gains)	(65,033,781)		(65,033,781)
Trust Contribution - Employer		38,626,741	(38,626,741)
Net Investment Income		9,199,977	(9,199,977)
Changes in Assumptions	77,711,915		77,711,915
Benefit Payments (net of retiree contributions)	(22,626,741)	(22,626,741)	0
Administrative Expense		(55,594)	55,594
Net Changes	92,245,473	25,144,383	67,101,090
Balance as of June 30, 2018 for FYE 2018	**$1,302,161,473**	**$129,425,035**	**$1,172,736,438**
Funded status		9.94%	

Section II. GASB 74 Disclosure (cont.)

Sensitivity of Total and Net OPEB Liability - Required by both GASB 74 and GASB 75

The following table presents Howard County Government's Total and Net OPEB liability. We also present the Total and Net OPEB liability if it is calculated using a discount rate that is 1 percentage point lower or 1 percentage point higher.

Discount Rate	1% Decrease 2.98%	Discount Rate 3.98%	1% Increase 4.98%
Total OPEB Liability	$1,562,877,749	$1,302,161,473	$1,097,164,767
Net OPEB Liability/(Asset)	$1,433,452,714	$1,172,736,438	$967,739,732

The following table presents Howard County Government's Total and Net OPEB liability. We also present the Total and Net OPEB liability if it is calculated using a health care cost trend rate that is 1 percentage point lower or 1 percentage point higher.

Ultimate Trend	1% Decrease 2.80%	Medical Trend 3.80%	1% Increase 4.80%
Total OPEB Liability	$1,078,040,597	$1,302,161,473	$1,601,141,603
Net OPEB Liability/(Asset)	$948,615,562	$1,172,736,438	$1,471,716,568

Section II. GASB 74 Disclosure (cont.)

Schedule of Changes in the Total Liability and Related Ratios - Required by both GASB 74 and GASB 75

Changes in Employer's Net OPEB Liability and Related Ratios
Last 10 Fiscal Years

As of June 30 Fiscal Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total OPEB liability										
Service Cost	$ 55,048,654	$ 64,956,663								
Interest Cost	47,145,426	40,906,500								
Changes in Benefit Terms	-	-								
Differences Between Expected and Actual Experience	(65,033,739)	-								
Changes of Assumptions	77,711,915	(162,653,154)				Information for FYE 2016				
Benefit Payments	(22,626,741)	(23,244,247)				and earlier is not available				
Net Change in Total OPEB Liability	92,245,515	(80,034,238)								
Total OPEB liability - Beginning of Year	1,209,915,958	1,289,950,238								
Total OPEB Liability - End of Year	1,302,161,473	1,209,916,000								

Plan Fiduciary Net Position
Last 10 Fiscal Years

As of June 30 Fiscal Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Contributions - Employer	$ 38,626,741	$ 36,324,027								
Net Investment Income	9,199,977	9,911,825								
Benefit Payments (net of retiree contributions)	(22,626,741)	(23,244,247)				Information for FYE 2016				
Administrative Expense	(55,594)	(3,002)				and earlier is not available				
Net Change in Fiduciary Net Position	25,144,383	22,988,603								
Fiduciary Net Position - Beginning of Year	104,280,652	81,292,049								
Fiduciary Net Position - End of Year	129,425,035	104,280,652								
Net OPEB Liability	1,172,736,438	1,105,635,348								
Fiduciary Net Position as a % of Total OPEB Liability	9.94%	8.62%								
Covered-Employee Payroll[1]										
Net OPEB Liability as a % of Payroll[1]										
Expected Average Remaining Service Years of All Participants	10	10								

Notes to Schedule:

Benefit changes: None.

Changes of assumptions: The discount rate was changed as follows:

Discount Rate:	
6/30/2017	3.94%
6/30/2018	3.98%

The Schools and Colleges mortality and decrement assumptions were updated to remain consistent with the Statewide Pension Valuation.

1/ Because this OPEB plan does not depend on salary, we do not have salary information.

Section II. GASB 74 Disclosure (cont.)

Schedule of Changes in the Actuarially Determined Contribution and Related Ratios - Required by both GASB 74 and GASB 75

Schedule of Employer Contributions
Last 10 Fiscal Years

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Actuarially determined contribution										
Contributions in relation to the actuarially determined contribution	Actuarially Determined Contributions are not calculated for this plan									
Contribution deficiency (excess)										
Covered-employee payroll[1]										
Contributions as a percentage of covered employee payroll[1]										

1/ Because this OPEB plan does not depend on salary, we do not have salary information.

Section III. Valuation Data

Counts – Government and Library

The following table summarizes the counts, ages, and coverage for the current and prior valuation.

Data as of			01/01/2016	01/01/2018
(1)	Number of Participants			
	(a)	Active Employees [1]	2,484	2,606
	(b)	Retirees in Pay Status (Pre-Medicare)	306	312
	(c)	Retirees in Pay Status (Post-Medicare)	437	529
	(d)	Long Term Disabled	4	6
	(e)	Deferred Vested Terminations [2]	35	29
	(f)	Opt-Out Inactives [3]	56	72
	(g)	Total [4]	3,322	3,554
(2)	Active Statistics			
	(a)	Average Age	44.85	44.94
	(b)	Average Service	12.36	12.33
(3)	Inactive Statistics – Average Age			
	(a)	Retirees in Pay Status (Pre-Medicare)	58.21	58.58
	(b)	Retirees in Pay Status (Post-Medicare)	72.58	72.44
	(c)	Long Term Disabled	45.25	47.33
	(d)	Deferred Vested Terminations	57.74	58.52
	(e)	Opt-Out Inactives	62.55	64.43

[1] *Does not include active participants not currently enrolled in medical coverage.*
[2] *For this valuation, we excluded deferred vested participants over the age of 65.*
[3] *These individuals opted out of OPEB benefits but could later decide to commence OPEB benefits.*
[4] *All Library employees are assumed to participate in the Howard County Retirement Plan.*

Section III. Valuation Data (cont.)

Counts - Government and Library

Active participants by pension plan			01/01/2016	01/01/2018
(1)	Howard County Retirement Plan			
	(a)	General	1,422	1,484
	(b)	Corrections	77	88
(2)	Howard County Police and Fire Employees Retirement Plan			
	(a)	Police	392	425
	(b)	Fire	354	387
(3)	Maryland State Pension and Retirement System		74	65
(4)	Library		165	157
(5)	Total		2,484	2,606

Retirees Coverage – Government and Library

The following table summarizes the counts of coverage by ages for the current retired employees as of 01/01/2018.

Age	Individual	Parent/Child	Husband/Wife	Family	Total
Less than 55	51	6	3	7	67
55 – 60	64	4	6	6	80
60 – 65	142	0	29	0	171
65 – 70	176	2	33	0	211
70 – 75	120	0	34	0	154
75 – 80	68	0	26	0	94
80 – 85	31	0	10	0	41
Greater than 85	23	0	6	0	29
Total	675	12	147	13	847

Section III. Valuation Data (cont.)

Counts - Schools

The following table summarizes the counts, ages, and coverage for the current and prior valuation.

Data as of	01/01/2016	01/01/2018
(1) Number of Participants		
(a) Active Employees with Medical Coverage	6,865	6,949
(b) Active Employees without Medical Coverage [1]	347	347
(c) Retirees in Pay Status (Pre-Medicare)	608	427
(d) Retirees in Pay Status (Post-Medicare)	1,752	2,063
(e) Retirees with only Life Insurance	508	535
(f) Total	10,080	10,321
(2) Active Statistics (for participants with medical coverage)		
(a) Average Age	44.24	45.61
(b) Average Service	10.60	11.54
(3) Inactive Statistics (for participants with medical coverage)		
(a) Average Age – Retirees (Pre-Medicare)	60.95	60.44
(b) Average Age – Retirees (Post-Medicare)	72.78	73.17

[1] *Only life insurance benefit is valued for these active participants.*

Section III. Valuation Data (cont.)

Retirees Coverage – Schools

The following table summarizes the counts of coverage by ages for the current retired employees as of 01/01/2018.

Age	Individual	Parent/Child	Husband/Wife	Family	Total
Less Than 55	27	0	5	0	32
55 – 60	72	3	27	0	102
60 – 65	209	5	79	0	293
65 – 70	549	2	164	0	715
70 – 75	523	4	113	0	640
75 – 80	296	1	55	0	352
80 – 85	177	0	24	0	201
Greater than 85	144	0	11	0	155
Total	1,997	15	478	0	2,490

Section III. Valuation Data (cont.)

Counts – College

The following table summarizes the counts, ages, and coverage for the current and prior valuation.

Data as of			01/01/2016	01/01/2018
(1)	Number of Participants			
	(a)	Active Employees	546	556
	(b)	Retirees in Pay Status (Pre-Medicare)	7	10
	(c)	Retirees in Pay Status (Post-Medicare)	44	51
	(d)	Total	597	617
(2)	Active Statistics			
	(a)	Average Age	48.63	48.21
	(b)	Average Service	10.57	10.72
(3)	Inactive Statistics (In Pay Status)			
	(a)	Average Age (Pre-Medicare)	60.43	62.40
	(b)	Average Age (Post-Medicare)	73.52	74.67

Section III. Valuation Data (cont.)

Retirees Coverage – College

The following table summarizes the counts of coverage by ages for the current retired employees as of 01/01/2018.

Age	Individual	Husband/Wife	Total
Less Than 60	1	0	1
60 – 65	7	2	9
65 – 70	5	1	6
70 – 75	18	5	23
75 – 80	9	3	12
80 – 85	6	1	7
Above 85	3	0	3
Total	49	12	61

Section III. Valuation Data (cont.)

Active Age & Service Distribution - All groups

Shown below is a distribution based on age and service of active participants who are currently receiving medical and drug benefits from the county as of 01/01/2018.

	Years of Service as of 01/01/2018							
Age	Under 1	01-04	05-09	10-14	15-19	20-24	25+	Total
Under 25	5	26	2	0	0	0	0	33
25 – 29	14	176	71	6	0	0	0	267
30 – 34	14	128	107	93	5	0	0	347
35 – 39	10	85	75	140	49	0	0	359
40 – 45	4	50	39	79	86	21	2	281
45 – 50	4	46	52	62	66	65	38	333
50 – 55	5	42	38	61	54	35	75	310
55 – 60	6	43	37	52	46	26	98	308
60 – 65	5	13	31	47	28	20	90	234
65 – 70	0	10	8	26	12	9	32	97
70 & Up	0	1	2	2	11	1	20	37
Totals	67	620	462	568	357	177	355	2,606

The following table shows averages in total for active participants in this valuation.

Averages	Amount
Age:	44.94
Service:	12.33

Section III. Valuation Data (cont.)

Active Age & Service Distribution – General Government and Library

Shown below is a distribution based on age and service of active participants who are currently receiving medical and drug benefits from the county as of 01/01/2018.

	Years of Service as of 01/01/2018							
Age	Under 1	01-04	05-09	10-14	15-19	20-24	25+	Total
Under 25	5	14	2	0	0	0	0	21
25 – 29	13	108	27	1	0	0	0	149
30 – 34	14	95	51	35	2	0	0	197
35 – 39	10	62	41	44	21	0	0	178
40 – 45	3	42	27	38	29	8	1	148
45 – 50	4	42	42	34	27	20	15	184
50 – 55	5	41	35	46	39	19	28	213
55 – 60	6	43	36	47	42	19	69	262
60 – 65	5	13	31	45	27	19	83	223
65 – 70	0	10	8	25	12	8	31	94
70 & Up	0	1	2	2	11	1	20	37
Totals	65	471	302	317	210	94	247	1,706

The following table shows averages in total for active participants in this valuation.

Averages	Amount
Age:	47.47
Service:	11.94

Section III. Valuation Data (cont.)

Active Age & Service Distribution – Corrections Group

Shown below is a distribution based on age and service of active participants who are currently receiving medical and drug benefits from the county as of 01/01/2018.

	Years of Service as of 01/01/2018							
Age	**Under 1**	**01-04**	**05-09**	**10-14**	**15-19**	**20-24**	**25+**	**Total**
Under 25	0	1	0	0	0	0	0	1
25 – 29	1	5	1	0	0	0	0	7
30 – 34	0	3	2	4	0	0	0	9
35 – 39	0	4	3	2	0	0	0	9
40 – 45	1	5	3	5	3	0	0	17
45 – 50	0	2	2	6	5	1	0	16
50 – 55	0	0	1	9	4	2	0	16
55 – 60	0	0	0	2	2	1	2	7
60 – 65	0	0	0	2	1	0	1	4
65 – 70	0	0	0	1	0	0	1	2
70 & Up	0	0	0	0	0	0	0	0
Totals	2	20	12	31	15	4	4	88

The following table shows averages in total for active participants in this valuation.

Averages	Amount
Age:	44.49
Service:	10.75

Section III. Valuation Data (cont.)

Active Age & Service Distribution – Fire Group

Shown below is a distribution based on age and service of active participants who are currently receiving medical and drug benefits from the county as of 01/01/2018.

	Years of Service as of 01/01/2018							
Age	Under 1	01-04	05-09	10-14	15-19	20-24	25+	Total
Under 25	0	4	0	0	0	0	0	4
25 – 29	0	24	25	4	0	0	0	53
30 – 34	0	18	24	29	1	0	0	72
35 – 39	0	5	14	38	14	0	0	71
40 – 45	0	1	4	18	25	2	0	50
45 – 50	0	2	4	15	22	23	16	82
50 – 55	0	0	0	4	5	5	17	31
55 – 60	0	0	1	1	1	2	15	20
60 – 65	0	0	0	0	0	1	3	4
65 – 70	0	0	0	0	0	0	0	0
70 & Up	0	0	0	0	0	0	0	0
Totals	0	54	72	109	68	33	51	387

The following table shows averages in total for active participants in this valuation.

Averages	Amount
Age:	39.83
Service:	13.41

Section III. Valuation Data (cont.)

Active Age & Service Distribution – Police Group

Shown below is a distribution based on age and service of active participants who are currently receiving medical and drug benefits from the county as of 01/01/2018.

	Years of Service as of 01/01/2018							
Age	Under 1	01-04	05-09	10-14	15-19	20-24	25+	Total
Under 25	0	7	0	0	0	0	0	7
25 – 29	0	39	18	1	0	0	0	58
30 – 34	0	12	30	25	2	0	0	69
35 – 39	0	14	17	56	14	0	0	101
40 – 45	0	2	5	18	29	11	1	66
45 – 50	0	0	4	7	12	21	7	51
50 – 55	0	1	2	2	6	9	30	50
55 – 60	0	0	0	2	1	4	12	19
60 – 65	0	0	0	0	0	0	3	3
65 – 70	0	0	0	0	0	1	0	1
70 & Up	0	0	0	0	0	0	0	0
Totals	0	75	76	111	64	46	53	425

The following table shows averages in total for active participants in this valuation.

Averages	Amount
Age:	39.53
Service:	13.23

Section III. Valuation Data (cont.)

Active Age & Service Distribution – Schools

Shown below is a distribution based on age and service of active participants who are currently receiving medical and drug benefits from the schools as of 01/01/2018.

		Years of Service as of 01/01/2018						
Age	**Under 1**	**01-04**	**05-09**	**10-14**	**15-19**	**20-24**	**25+**	**Total**
Under 25	28	39	2	0	0	0	0	69
25 - 29	50	451	117	2	0	0	0	620
30 - 34	49	250	342	163	6	0	0	810
35 - 39	51	196	145	375	95	2	0	864
40 - 44	20	171	144	210	275	33	0	853
45 - 49	24	152	157	196	202	153	31	915
50 - 54	26	130	154	230	176	110	152	978
55 - 59	13	82	123	237	204	116	149	924
60 - 64	5	35	73	134	150	109	148	654
65 - 69	0	12	12	37	55	40	55	211
70 & Up	0	3	7	9	11	4	17	51
Totals	266	1,521	1,276	1,593	1,174	567	552	6,949

The following table shows averages in total for active participants in this valuation.

Averages	**Amount**
Age:	45.61
Service:	11.54

Section III. Valuation Data (cont.)

Active Age & Service Distribution – College

Shown below is a distribution based on age and service of active participants who are currently receiving medical and drug benefits from the college as of 01/01/2018.

		Years of Service as of 01/01/2018						
Age	Under 1	01-04	05-09	10-14	15-19	20-24	25+	Total
Under 25	2	1	0	0	0	0	0	3
25 - 29	2	19	6	1	0	0	0	28
30 - 34	5	39	9	7	0	0	0	60
35 - 39	4	33	20	18	3	0	0	78
40 - 44	1	19	9	10	6	3	0	48
45 - 49	3	22	15	17	10	3	1	71
50 - 54	2	15	17	10	11	10	4	69
55 - 59	3	15	8	13	15	10	11	75
60 - 64	0	5	13	11	14	12	22	77
65 - 69	0	3	8	5	8	6	9	39
70 & Up	0	0	1	0	2	0	5	8
Totals	22	171	106	92	69	44	52	556

The following table shows averages in total for active participants in this valuation.

Averages	Amount
Age:	48.21
Service:	10.72

Section IV. Summary of Principal Plan Provisions - Government

General Eligibility Rules

Employees, former employees, and beneficiaries of Howard County Government who are receiving pensions are currently eligible for benefits under this Plan. To receive benefits under the Plan, the retiree must have 15 years of County service for retirements after July 1, 2009. (Previously, 10 years of County service was required.) Also, immediately preceding retirement, the retiree must have been enrolled in a medical insurance plan offered to active employees of the County.

There is a grandfathered group. Employees who satisfy either of the following conditions will be eligible for OPEB benefits under this Plan:

- Employees with 10 years or more of County service as of July 1, 2009, or
- Employees hired between July 1, 1999 and June 30, 2009, and were age 50 or older at the time of hire and have at least 10 years of County service at time of retirement.

Eligible retirees who enroll at retirement and subsequently drop their coverage will be allowed a one-time only opt in during a future open enrollment period or due to a qualifying event as defined by applicable IRS guidelines. Eligible retirees who elect to not enroll at retirement will be allowed a one-time only opt-in during a future open enrollment period or due to a qualifying event as defined by applicable IRS guidelines.

Eligible retirees and their dependents over the age of 65 must be enrolled in Medicare Part A and Part B. The plan options for the Medicare eligible retirees are one of two Medicare Advantage plans with Aetna or one Cost Plus plan with Kaiser. All three plans have a PDP.

Pension Plan Eligibility Rules

Each participant in the OPEB plan is also a participant in one of four possible pension plans:

- Howard County Retirement Plan,
- Howard County Police and Fire Employees' Retirement Plan,
- Maryland State Retirement System, or
- Maryland State Pension System,

The retirement and disability eligibility conditions for these plans are summarized below.

Retirement eligibility

The eligibility conditions for retirement depend upon the pension plan as follows.

Howard County Retirement Plan

General employees hired after June 30, 1995, participate in the Howard County Retirement Plan. Consequently, most active participants are in this pension plan. The earliest retirement eligibility conditions depend upon whether the participant is a "general" employee or "corrections" employee.

Section IV. Summary of Principal Plan Provisions – Government (cont.)

Pension Plan Eligibility Rules (cont.)

General: earlier of

- Age 62 when age plus eligibility service is at least 67, and at least 2 years of eligibility service,
- Age 55 with 15 years of eligibility service (early), or
- 25 years of eligibility service (regardless of age) (early).

Corrections: earlier of

- Meets one of the requirements for retirement described above, or
- 20 years of eligibility service (regardless of age).

Howard County Police and Fire Employee' Retirement Plan

Earlier of:

- Age 62 with 5 years of eligibility service, or
- 20 years of eligibility service (regardless of age) if at least 10 years were served as a covered employee.

Maryland State Pension System (for members hired before 7/1/2011)

There is a closed group of active participants who are members of the Maryland State Pension System. A smaller closed group of active participants are members of the old Maryland State Retirement System. Because these are small closed groups, we summarize below the earliest retirement eligibility for only the Maryland State Pension System. For member hired before 7/1/2011, the earliest retirement eligibility is the earlier of:

- Age 55 with 15 years of service,
- Age 62 with 5 years of service,
- Age 63 with 4 years of service,
- Age 64 with 3 years of service,
- Age 65 with 2 years of service, or
- 30 years of service (regardless of age).

Disability eligibility

Retirees collecting line of duty disability benefits from the Howard County Police and Fire Employees' Retirement Plan will receive health insurance benefits in accordance with that plan. All other disability retirements must satisfy this OPEB Plan's general eligibility rules to receive OPEB benefits.

Line of Duty – Line of duty disabilities that occur after 6 months of employment are immediately eligible. Retirees collecting ordinary disability benefits, who are also covered by Medicare because they have been receiving disability benefits under Social Security for more than 24 months, will be eligible retirees under this OPEB Plan. The County will pay 100% of the premium for these retirees.

Ordinary – Participants must meet retirement eligibility to be eligible for access to the plan.

Section IV. Summary of Principal Plan Provisions – Government (cont.)

Pension Plan Eligibility Rules (cont.)

Deferred vested participants

There is a closed group of terminated vested participants in this Plan. Except for this closed group, deferred vested individuals cannot receive OPEB benefits under this Plan.

Employer Subsidy

For medical coverage, the County provides an explicit subsidy that depends upon service as follows:

Service at retirement	Subsidy for employees retiring prior to July 1, 2009	Subsidy for employees retiring on or after July 1, 2009
Under 15	50%	0%
15 to 19	50%	50%
20 to 24	75%	75%
25 to 29	90%	90%
30 or More	100%	90%

The subsidy is a percentage of the premium for the Aetna PPO plan for employees who retired before July 1, 2009. The subsidy is a percentage of the premium for the Aetna HMO plan (also called Aetna Select Open Access) for Pre-Medicare employees who retired after July 1, 2009. The subsidy is a percentage of the premium for the Medicare Advantage 10 plan for Medicare eligible retirees who retired on or after July 1, 2009. Employees with 25 or more years of service as of July 1, 2009, are grandfathered in the old subsidy schedule. The County subsidy cannot be greater than the premium for individual coverage under the medical plan chosen.

Dependent spouse subsidy is 25% of the difference between husband/wife and individual coverage under the lowest cost plan. The spouse subsidy does not depend upon the age of the spouse. It only depends upon the age of the retired employee. The current monthly subsidy for dependent spouse coverage (or family coverage) is summarized below:

Age of retired employee	Monthly County subsidy for dependent spouse medical coverage
Under 65	179.06
Age 65 or more	75.28

The retiree subsidy plus the spouse subsidy cannot be greater than the premium for husband/wife coverage under the medical plan chosen. Participants with individual plus children coverage do not receive any additional explicit subsidy due to the children coverage.

Section IV. Summary of Principal Plan Provisions – Government (cont.)

Employer Subsidy (cont.)

The surviving spouse of an eligible retiree may continue OPEB coverage but must pay 100% of the published costs. The surviving spouse of an employee who dies while in active service may enroll in the OPEB Plan by paying the full cost of the Plan if the employee would have met the definition of an eligible retiree on the day prior to his/her death and if the surviving spouse will receive a monthly benefit allowance from one of the four pension plans named previously.

Effective January 1, 1999, the County pays 100% of the cost for surviving spouses and dependent children of any employee killed in the line of duty.

There is a closed group of disabled employees who receive the same subsidy as an active employee. This subsidy level will continue for the life of the employee.

The County pays 25% of the individual dental premium based upon the lowest cost plan (currently Dominion Dental) for a retired employee. Dependent spouse dental subsidy is 25% of the difference between the premium for husband/wife coverage versus individual coverage under the lowest cost plan (currently Dominion Dental).

Underlying Plan Description

Retirees Under Age 65

Retirees under age 65 can choose between the Aetna Open Choice PPO Plan, the Aetna Select Open Access HMO Plan, and the Kaiser Permanente Select HMO Plan.

The HMO plans have no deductibles or coinsurance payments. Office visits are covered in full after a co-pay ($10 for primary care, $20 for specialist). There are no out-of-network benefits.

Prescription drug benefits are covered at plan pharmacies with a $10 copayment for generic drugs, $30 copayment for preferred brand name drugs, and a $50 copayment for non-preferred brand drugs.

Section IV. Summary of Principal Plan Provisions – Government (cont.)

Underlying Plan Description (cont.)

Deductibles, copayment and maximum out-of-pocket payments for the Aetna PPO Plan depend upon whether services are provided in or out of networks as summarized in the following table.

Howard County Government, Library, and College (Aetna PPO Plan)		
	In Network	Out-of-Network
Deductible	$250/individual, $500/family per calendar year	$500/individual, $1,000/family per calendar year
Co payment	10% coinsurance after $20 co-pay/visit	30% coinsurance
Co-Insurance	90% of allowed benefit	70% of allowed benefit
Yearly maximum out of pocket	$1,500/individual, $3,000/family combined with deductible and copays	$4,000/individual, $8,000/family combined with deductible and copays

These benefits are subject to change at any time.

Retirees Over Age 65

Post-Medicare retirees will have a choice between two fully-insured Medicare Advantage Plans with a PDP with Aetna or the Kaiser Medicare Cost Plus Plan also fully-insured with a PDP. These plans have their own prescription drug benefits.

These benefits are subject to change at any time.

Vision Benefits

The medical plans also include vision benefits as summarized below.

	Kaiser Permanente	Vision Service Plan (for Aetna Plans)
Routine Exam	Primary care: $10 / visit Specialist: $20 / visit	In net work: $10 copay Out of network: $52 retail allowance
Frames	25% discount when purchased from a Maryland Eye Care provider	In network: allowance up to $130 retail plus $20% off any out of pocket cost Out of network: retail allowance up to $70

Dental Benefits

Retirees can choose between two dental plans, the Delta Dental PPO Plus and Dominion Dental.

Section IV. Summary of Principal Plan Provisions – Government (cont.)

Life Insurance

None.

Changes in plan provisions since prior valuation

None

Section V. Summary of Principal Plan Provisions - Schools

General Eligibility Rules

Employees, former employees, and beneficiaries of the Howard County Public School System (HCPSS) who are receiving pensions, are currently eligible for benefits under this Plan. Participants must meet the pension eligibility requirements of the State of Maryland Employees' Retirement and Pension System.

- Dependents and surviving spouses are allowed access to the plan but must pay the full cost to participate.
- The Plan requires 15 years of service at retirement for employees retiring on or after July 2, 2010. There are grandfathered groups, see below for more details.
- The Plan allows employees who waive coverage at retirement to rejoin the plan if there is a qualifying event (e.g. loss of a job).
- Employees who left employment prior to retirement eligibility are not allowed access to the Plan even when they are eligible to receive deferred vested pension benefits.
- Disabled participants must meet retirement eligibility to participate.

Pension Eligibility

Under the State of Maryland Employees' Pension System (EPS), members hired on or after July 1, 2011 are in the Reformed Contributory Pension System. The earliest retirement eligibility under the Reformed Contributory Pension System is the earlier of:

- Rule of 90 (age plus service is at least 90),
- Age 65 with 10 years of service, or
- Age 60 with 15 years of service.

For members of EPS hired before July 1, 2011, the earliest retirement eligibility is the earlier of:

- Age 55 with 15 years of service,
- Age 62 with 5 years of service,
- Age 63 with 4 years of service,
- Age 64 with 3 years of service,
- Age 65 with 2 years of service, or
- 30 years of service (regardless of age).

Section V. Summary of Principal Plan Provisions – Schools (cont.)

Employer Subsidy

The Howard County Public School System's (HCPSS) subsidy is based on the participant's age and service. The subsidy percent is applied to the premium for individual coverage to arrive at the dollar amount of HCPSS subsidy, regardless of the actual coverage level chosen by the participant (for example, individual, husband/wife, or family). The retiree must pay any difference between the actual premium and the HCPSS subsidy.

The subsidy schedule for retired employees is as follows.

Participants who retired before July 2, 2010 ("Old Plan")

Years of Service	Pre-Medicare	Post-Medicare
Less than 10	0%	0%
10	50%	50%
11	55%	55%
12	60%	60%
13	65%	65%
14	70%	70%
15	75%	75%
16-19	80%	80%
20-24	90%	90%
25-29	90%	90%
30 or more	90%	100%

For "Old Plan" participants, the subsidy is as a percentage of the premium for the medical plan selected by the retired employee.

Participants who retired on or after July 2, 2010 ("New Plan")

Among participants who retired on or after July 2, 2010, there are two grandfathered groups.

Grandfathered 1
This group is comprised of employees with 25 or more years of HCPSS service as of 7/1/2009, who retire with at least 30 consecutive years of service.

Grandfathered 2
This group is comprised of the participants who are not in the Grandfathered 1 group, but satisfy one of the following:

1. Have 10 or more years of HCPSS service as of 7/1/2009, or

Section V. Summary of Principal Plan Provisions – Schools (cont.)

Employer Subsidy (cont.)

Participants who retired on or after July 2, 2010 ("New Plan") (cont.)

2. Meet all of the requirements below:
   - Hired between 7/1/1999 and 6/30/2009,
   - Age 50 at date of hire or turned age 50 within the calendar year of hire, and
   - Have at least 10 years of HCPSS service at date of retirement.

The employer subsidy is summarized below.

Years of Service	Regular	Grandfathered 1-Pre-Medicare	Grandfathered 1 – Post-Medicare	Grandfathered 2
Less than 10	0%	0%	0%	0%
10-14	0%	50%	50%	50%
15-19	50%	50%	50%	50%
20-24	75%	75%	75%	75%
25-29	90%	90%	90%	90%
30 or more	90%	90%	100% [1]	90%

For "New Plan" participants, the subsidy is as a percentage of the premium for the Aetna HMO plan. (The medical plan actually chosen by the retiree has no impact on the amount of the subsidy.)

The employer subsidy is for medical benefits only. There is no employer subsidy for dental or vision benefits. There is no subsidy for dependents and surviving spouses.

Underlying Plan Description

The underlying medical plan is described below. These benefits are subject to change at any time.

Retirees can choose between three plans:
- Aetna Open Choice PPO
- Open Access Aetna Select HMO
- Blue Choice HMO Open Access

[1] The 100% subsidy is available to participants with 30 or more years of HCPSS service who have reached age 65, and satisfy the criteria for the Grandfathered 1 group

Section V. Summary of Principal Plan Provisions – Schools (cont.)

Underlying Plan Description (cont.)

The Aetna PPO is very similar to the Open Access Aetna Select HMO with no need to select a primary care physician and no need to get a referral to see a specialist. However, the PPO allows for out-of-network coverage. Deductibles, copayment and maximum out-of-pocket payments for the Aetna PPO Plan are summarized in the following table.

Howard County Schools – Aetna PPO Plan – Retirees Under Age 65		
	In Network	**Out-of-Network**
Deductible	$0	$100 individual; $300 family
Co-Insurance Hospital	100%	80% after deductible
Office Visits	$15	80% after deductible
Specialist Office Visits	$20	80% after deductible
Maximum out of pocket (calendar year)	$500 individual, $1,500 family	$1,000 individual, $3,000 family

The two HMO plans are summarized in the table below. Aetna Select HMO offers a nationwide network of doctors. There is no requirement for a primary care physician. No referrals are necessary for specialists.

Blue Choice HMO offers a regional network of doctors in the Maryland, DC, and northern Virginia area. Blue Choice HMO requires each member to have a primary care physician. No referrals are necessary for specialists.

Howard County Schools – HMO Plans – Retirees Under Age 65		
	Aetna Select HMO	**Blue Choice HMO**
Deductible	$0	$0
Co-Insurance Hospital	100%	100%
Office Visits	$10	$10
Specialist Office Visits	$15	$15
Maximum out of pocket (calendar year)	$2,000 individual, $6,000 family	$2,000 individual, $6,000 family

Section V. Summary of Principal Plan Provisions – Schools (cont.)

Underlying Plan Description (cont.)

Prescription drugs

Express Scripts was chosen by Howard County Public School System for its prescription benefit plan starting January 1, 2012. Prescription drug benefits are covered as follows.

Howard County Schools – PPO Plan	In Network Pharmacy – up to 30 day supply	Mail order – up to 90 day supply
Generic	$10	$20
Preferred brand name	$20	$40
Non-Preferred brand name	$35	$70

Howard County Schools – HMO Plan	In Network Pharmacy – up to 30 day supply	Mail order – up to 90 day supply
Generic	$5	$10
Preferred brand name	$10	$20
Non-Preferred brand name	$25	$50

Retirees Over Age 65

Medicare eligible retirees must enroll in Medicare Parts A and B. This Plan only offers supplemental coverage for Medicare eligible retirees. Consequently, retirees eligible for Medicare receive a reduction in premium. The medical plans are set up so that the total benefits remain unchanged Post-Medicare.

This Plan includes a prescription drug plan for Medicare eligible participants, and as a result it is not necessary for retirees to enroll in Medicare Part D.

Dental and Vision Benefits

Retirees may choose between two dental plans, Delta Dental and Cigna DHMO. Retirees may also choose vision coverage offered through VSP vision. The retiree must pay the entire premium for this coverage. There is no employer subsidy for dental or vision benefits.

Section V. Summary of Principal Plan Provisions – Schools (cont.)

Life Insurance

An employee who retires as a member of the Maryland State Retirement and Pension Systems, with at least 10 consecutive years of service, and who reside in the United States are included for life insurance fully paid for by HCPSS.

Life insurance benefit starts at lesser of one times basic yearly earnings or $250,000. The basic yearly earnings does not include bonuses, commissions or overtime pay. The life insurance benefit reduces as follows:

a) 10% at the date of retirement, and
b) 10% of the original amount of insurance on each of the next four anniversaries of the date of retirement.

For example, for a person with $100,000 basic yearly earnings at date of retirement, his/her life insurance will be $50,000 on the fourth anniversary of the date of retirement. ReliaStar Life Insurance Company is the life insurance carrier.

Changes in plan provisions since prior valuation

None.

Section VI. Summary of Principal Plan Provisions – College

General Eligibility Rules

Employees, former employees, and beneficiaries of the Community College of Howard County (HCC) who had health coverage as active employees and are receiving pension benefits are eligible for coverage. HCC employees may choose between three different retirement plans:

- Maryland State Retirement and Pension System,
- TIAA-CREF, and
- Fidelity.

Both TIAA-CREF and Fidelity are defined contribution plans and they are called Optional Retirement Programs (ORP). The Optional Retirement Programs are available only to professional employees with baccalaureate degrees or higher. Full and part time, position control/budgeted support staff are automatically enrolled in the Maryland Teachers' Pension System or the Maryland Employees' Pension System.

Retirees must meet one of the following rules to be considered a retiree eligible to participate in the group health plan:

- Age 55 with at least 15 years of HCC service.
- Age 59 ½ with at least 10 years of HCC service,
- Age 62 with at least 5 years of HCC service, or
- 30 years of HCC service regardless of age.

Section VI. Summary of Principal Plan Provisions – College (cont.)

General Eligibility Rules (cont.)

Employees who enroll in retiree insurance at retirement and subsequently drop their coverage are allowed a one-time only opt-in during a future open enrollment period or due to a qualifying event. Employees who elect not to enroll at retirement will be allowed a one-time only opt-in during a future open enrollment period or due to a qualifying event. Qualifying events are defined by applicable IRS guidelines.

Eligible retirees over age 65 must be enrolled in Medicare Part A and Part B and have a choice between two Medicare Advantage Aetna plans with PDP or Kaiser Medicare Cost Plus plan. All three plans are fully insured.

Dependents and surviving spouses are allowed access to the plan, but must pay the full cost to participate.

Terminated vested participants are not allowed access to the plan.

Retirement Eligibility

The retirement eligibility requirements of the State Retirement and Pension System of Maryland are as follows. Under the State of Maryland Employees' Pension System (EPS), members hired on or after July 1, 2011 are in the Reformed Contributory Pension System. The earliest retirement eligibility under the Reformed Contributory Pension System is the earlier of:

- Rule of 90 (age plus service is at least 90),
- Age 65 with 10 years of service, or
- Age 60 with 15 years of service.

For members of EPS hired before July 1, 2011, the earliest retirement eligibility is the earlier of:

- Age 55 with 15 years of service,
- Age 62 with 5 years of service,
- Age 63 with 4 years of service,
- Age 64 with 3 years of service,
- Age 65 with 2 years of service, or
- 30 years of service (regardless of age).

Long term disability

Employees who are disabled and on approved long-term disability leave who do not meet the retiree policy requirements may continue coverage with the college by paying full cost of the insurance until Medicare becomes available up to a maximum of two years. In order to be eligible for this coverage, employees must be in the plan at the time that the long-term disability begins.

Section VI. Summary of Principal Plan Provisions – College (cont.)

Underlying Medical Plan Description

College retirees participate in the same medical plan as general County employees. See the underlying medical plan description in Section 4.

Employer Subsidy

HCC provides a subsidy for employees with 10 or more years of full time service. The subsidy is a percent of the premium for the medical plan chosen by the retiree. The subsidy schedule is as follows:

Years of Service	Employer Subsidy %
0 – 9	0%
10 – 14	37.5%
15 – 19	50%
20 – 24	60%
25 – 29	70%
30+	80%

There is no explicit subsidy for dependents and surviving spouses.

Life Insurance and Dental

No retiree life insurance or dental benefit is provided.

Changes in plan provisions since prior valuation

None.

Section VII. Cost Method and Economic Assumptions (All groups - County, Schools, and College)

Cost Method

This valuation uses the Entry Age Normal funding method calculated on an individual basis with level percentage of payroll. This is the required funding method under GASB 74.

Party Responsible for Assumptions and Methods

Howard County, Maryland.

Actuarial Valuation Date

January 1, 2018 for the FYE 2018 calculations

Measurement Date

June 30, 2018 for FYE 2018. No adjustments have been made for events after the measurement date.

Roll-Forward Method

If necessary, liabilities are rolled forward from the actuarial valuation date to the measurement date through use of a roll forward method. Liabilities are adjusted for passage of time by adding normal cost minus benefit payments, all adjusted with interest.

Age of Spouse

Females are assumed to be 3 years younger than their spouse, and males are assumed to be three years older than their spouse.

Asset Method

Market Value of Assets. Assets are assumed to earn a 7.50% return.

Interest Assumptions

Discount Rate as of beginning of year	3.94%
Discount rate as of end of year	3.98%

Section VII. Cost Method and Economic Assumptions (All groups - County, Schools, and College) (cont.)

Trend Assumptions

Based upon 2016 SOA Model, 1.6% GDP, adjusted for the anticipated impact of the ACA Excise Tax. Representative Rates are as follows:

	Pre-65		Post-65	
Year	County/College	Schools	County/College	Schools
2018	5.50%	5.50%	5.50%	5.50%
2019	5.40%	5.40%	5.40%	5.40%
2020	5.30%	5.30%	5.30%	5.30%
2021	5.20%	5.20%	5.20%	5.20%
2022	5.20%	5.20%	5.20%	5.20%
2023	5.20%	5.20%	5.20%	5.20%
2024	5.20%	5.20%	5.20%	5.20%
2025	6.00%	5.20%	5.20%	5.20%
2030	6.20%	5.20%	5.20%	5.20%
2040	5.90%	6.10%	5.20%	5.20%
2050	5.30%	5.40%	4.80%	4.80%
2060	4.90%	5.00%	4.60%	4.60%
2070	4.40%	4.40%	4.20%	4.20%
2080	4.00%	4.00%	3.80%	3.80%
2090+	3.90%	4.00%	3.80%	3.80%

Dental Trend 5.00%

Payroll Assumption

Payroll is assumed to grow 2.2% per year.

Changes in assumptions and methods since prior valuation

The medical trend was updated. The trend was developed using the Society of Actuaries (SOA) Long-Run Medical Cost Trend Model baseline assumptions. The prior valuation used the SOA model as released in September 2015. The current valuation uses the model as updated in November 2016.

Section VIII. Valuation Methods and Assumptions – Government

Election Percent

For active participants who currently have medical coverage and are eligible for OPEB benefits at retirement, the table below shows the probability of the participant continuing OPEB coverage at date of retirement:

Service	Election Rate
0 to 9	0%
10 to 19	90%
20 to 24	95%
25 or More	100%

Opt-Out Opt-In Coverage

For actives who decrement prior to age 60, the people who elect OPEB coverage given above is further subdivided into two groups, one group that commences OPEB benefits immediately upon retirement, a second group that defers OPEB benefits until age 60. We assumed that the following percentage times the election rate above would defer OPEB benefits (opt-out of OPEB coverage at retirement) and rejoin the Plan at age 60.

Percent of Employees Deferring Coverage To Age 60			
Age at Retirement	**Public safety**	**General**	**Corrections**
<50	15%	15%	15%
50-54	10%	15%	10%
55-59	5%	10%	5%

In addition, for actives who decrement prior to age 60, are eligible for OPEB benefits, but do NOT elect OPEB benefits, we have assumed that 25% of these individuals will come back and elect OPEB coverage starting at age 60. For example, an individual with 10 years of service has 10% probability of not electing OPEB coverage (100% – 90% = 10%). Of this 10%, there is 25% chance the person will come back to the OPEB plan, i.e. 0.25% of the person will come back to the OPEB plan.

Participants who go from active to disabled status are assumed to take immediate OPEB benefits. In other words, we assume no disabled person elects to opt out.

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Payroll Assumption

Years of Service	General	Corrections	Police/Fire
0 - 4	6.55%	6.25%	7.55%
5 - 9	5.75%	6.75%	6.55%
10 - 14	5.50%	6.75%	5.85%
15 - 19	4.85%	6.75%	5.80%
20 - 24	4.00%	4.25%	4.55%
25 +	4.00%	4.25%	4.25%

Coverage Status, Age of Spouse, and Medical Plan

Actual coverage status is used. For example, participants with individual coverage at valuation date are assumed to retain individual coverage until death. Participants with husband/wife coverage at valuation date are assumed to retain husband/wife coverage until death.

Females are assumed 3 years younger than male spouse. Employees with family coverage are assumed to continue family coverage in retirement. Employees with individual coverage are assumed to elect individual coverage in retirement. Employees currently waiving coverage are assumed to continue to waive coverage in retirement.

We also assumed that participants will stay in their current medical plan. For example, if a participant is currently enrolled in Kaiser Permanente, then we assumed the participant will remain in Kaiser until death. If a participant is currently enrolled in Aetna PPO, then we assumed the participant will remain in Aetna PPO until death. For Medicare eligible retirees we assumed the Medicare Advantage Plan closest to their current medical plan.

The closed group of terminated vested participants are assumed to elect individual coverage when they commence OPEB benefits. The small group of current inactives who opted out of OPEB coverage are assumed to elect individual coverage when they commence OPEB benefits.

Decrement Assumptions

Below is a summary of decrements used in this valuation. Sample Retirement, Disability, and Termination rates are illustrated in the tables below.

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Decrement Assumptions (cont.)

Mortality Decrements – Police and Fire	
Healthy	Pre-Retirement: Generational RP-2000 Combined Mortality Table for Males and Females set back 2 years, projected using Scale AA. 20% of active participant mortality is assumed to be service connected and 80% is assumed to be non-service connected
	Post-Retirement: Generational RP-2000 Combined Mortality Table for Males and Females projected using Scale AA.
Disabled	PBGC Disabled Life Mortality Tables (III & IV) set forward 2 years

Mortality Decrements – General and Corrections	
Healthy	Pre-Retirement: 70% of the Generational RP-2000 Combined Mortality Table for Males and Females projected using Scale AA.
	Post-Retirement: Generational RP-2000 Combined Mortality Table for Males and Females projected using Scale AA.
Disabled	2014 ERISA 4044 Mortality - eligible for Social Security for General Employees. 2014 ERISA 4044 Mortality – not eligible for Social Security for Corrections Employees.

For corrections and general employees, no death is assumed to be in the line of duty.

Termination of Employment

Termination Rates – Police and Fire		
Years of Service	Police Rates	Fire Rates
0	7.00%	4.00%
1	4.00%	4.00%
2 – 4	2.00%	2.00%
5 – 9	1.50%	1.00%
10 – 14	1.00%	0.50%
15 or More	0.00%	0.00%

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Decrement Assumptions (cont.)

Termination Rates – Corrections and General		
Years of Service	Corrections Rates	General Rates
0	17.00%	11.80%
1	3.00%	11.70%
2	3.00%	7.00%
3	3.00%	7.00%
4 – 9	5.00%	4.30%
10 – 14	5.00%	3.50%
15 – 19	0.00%	3.50%
20 or More	0.00%	1.00%

Retirement Rates

Retirement Rates – Police and Fire		
Eligibility Service	Police	Fire
20	15.00%	10.00%
21 – 23	3.00%	5.00%
24	20.00%	7.50%
25 – 28	8.00%	3.00%
29	8.00%	5.00%
30	100.00%	10.00%
31 – 34	N/A	5.00%
35	N/A	100.00%

The retirement rate for Fire employees is 100.00% once an employee reaches age 62 (regardless of service).

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Decrement Assumptions (cont.)

Retirement Rates (cont.)

Retirement Rates - Corrections	
Age/Retirement Eligibility	**Rate**
Early retirement	
First eligibility	30.00%
Early retirement after first eligibility	5.00%
Normal retirement eligible, age < 62	
First eligible for normal	55.00%
After first eligible for normal, age <= 49 and service < 25	1.00%
All other age/service groups	16.00%
Normal retirement eligible and age 62+	70.00%
Age 70 and over	100.00%

Retirement Rates - General	
Age/Retirement Eligibility	**Rate**
Early retirement	5.00%
First eligible for normal retirement	
Before age 60	20.00%
Age 60 and over	22.00%
After first eligible for normal, by age group	
Under age 50	1.00%
50 – 59	6.00%
60 – 74	22.00%
Age 75 and over	100.00%

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Decrement Assumptions (cont.)

Disability Rates

	Disability – Police and Fire	
Age	**Police**	**Fire**
25	0.1222%	0.0750%
35	0.1577%	0.0968%
45	0.2700%	0.1658%
55	0.8700%	0.5340%

85% of the disabilities are assumed to be line of duty.

	Disability - Corrections
Age	**Annual Percent of Disablement**
25	0.0500%
35	0.0646%
45	0.1768%
55	0.5696%

66.67% of the disabilities are assumed to occur in the line of duty.

	Disability - General
Age	**Annual Percent of Disablement**
25	0.0240%
35	0.0310%
45	0.0530%
55	0.1709%

None of the disabled employees were assumed to eligible for Medicare Disabled benefits.

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Claims Assumption

The plan is self-insured for actives and non-Medicare eligible retirees. The two Aetna Medicare Advantage and Kaiser Medicare Cost Plus plan are fully insured. The retiree contribution and County subsidy was provided for each retiree. We assumed that each employee would continue in the same medical plan after retirement for non-Medicare eligible retirees and the closest Medicare Advantage plan for Medicare eligible retirees.

The gross claims for the AETNA plans are based on enrollment and paid medical claims and prescription for pre and post-age 65 retirees paid for January 1, 2016 – December 31, 2017. Claims and enrollments were divided into Medicare and Non-Medicare eligible retirees. The claims were projected to Fiscal Year 2018. Pre-65 claims were projected assuming 5% annual increases and Post-65 claims were projected assuming 5% annual increases.

The gross claims for the Kaiser plans are based on premiums for employees and Pre-65 retirees paid for FYE 2018. The claims were projected to Fiscal Year 2018 assuming 9% annual increases.

The Pre-Medicare AETNA claims assumption is a weighted average of the projected claims with fiscal year 2016 claims weighted 30%, and the fiscal year 2017 claims weighted 70%. Pre-Medicare AETNA claims were adjusted for IBNR and prescription rebates as follows:

Year	Adjustment
01/01/2018 – 12/31/2018	1.005
01/01/2017 – 12/31/2017	1.005

The resulting average Pre-Age 65 were age adjusted.

The Post-Medicare claims are based on the weighted average of the Medicare Advantage plans premium based on the plan that matched closest to their active plan.

Administrative fixed costs were assumed to be $50.85 per month for single coverage for Pre-Medicare eligible participants. Family coverage was assumed to be 2.08 times the cost of the individual coverage for AETNA retirees less than age 65, 2.55 times the cost of the individual coverage for Kaiser retirees less than age 65, and 2.00 for retirees age 65 or older.

The charts below shows the current cost broken down between the published per capita cost (i.e., the blended rates) and the total costs (including implicit subsidies).

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Claims Assumption (cont.)

FYE 2018 Kaiser Claims	Single	Family
1. Assumed Costs		
a. Under Age 65	6,612	16,859
b. Over Age 65	N/A	N/A
2. Total Costs		
a. Under Age 50	6,480	16,524
b. Ages 50-54	7,896	20,134
c. Ages 55-59	9,257	23,606
d. Ages 60-64	11,163	28,466
e. Age 65 and above	N/A	N/A

FYE 2018 AETNA Claims	Single	Family
1. Assumed Costs		
a. Under Age 65	8,207	17,070
b. Over Age 65	7,001	14,002
2. Total Costs		
a. Under Age 50	8,632	17,954
b. Ages 50-54	10,484	21,807
c. Ages 55-59	12,214	25,406
d. Ages 60-64	14,434	30,023
e. Ages 65-69	6,414	12,829
f. Ages 70-74	7,626	15,252
g. Ages 75-79	7,982	15,965
h. Ages 80-84	8,552	17,105
i. Age 85 and older	8,517	17,034
3. Dental	370	
4. Vision	57	

Section VIII. Valuation Methods and Assumptions – Government (cont.)

Claims Assumption (cont.)

Monthly premium for individual medical coverage – Pre-Medicare	
Aetna PPO	718.73
Aetna HMO	608.75
Kaiser	550.96

Monthly premium for individual medical coverage – Medicare Eligible	
Medicare Advantage ESA95	612.35
Medicare Advantage 10	590.86
Kaiser	301.13

Monthly premium for individual dental coverage	
Delta Dental PPO Plus	33.46
Dental Quest EPPO	13.65

Other Assumptions

- Active participants who are in the Maryland State Retirement or Pension System were valued like active participants in the Howard County Retirement Plan.
- Retirees are assumed to not change their medical plan. For example, if a retiree has Aetna PPO as of valuation date, we assumed that the retiree will stay in Aetna PPO for the remainder of his/her life. Medicare eligible retirees are assumed to stay in the Medicare Advantage plan closest to their active plan.
- Regarding the closed group of terminated vested participants who are eligible for benefits under this plan:
  - All participants who are retired in the pension plan are excluded from this valuation.
  - The terminated vested participants over age 65 as of valuation date were not valued.
  - 20% of participants in this closed group are assumed to elect coverage upon reaching age 62.
- Opt out inactives who are less than age 60 on valuation date were assumed to return to the OPEB plan at age 60 with 15% probability. When they return, they were assumed to have 90% County subsidy, elect Kaiser, individual medical coverage. They were assumed to elect individual dental coverage.

Changes in assumptions and methods since prior valuation

- The claims assumption was updated to include the most recent plan experience.

Section IX. Valuation Methods and Assumptions - Schools

Payroll Assumption

Merit Scale:

First 10 Years		10 or More Years	
Service	Increase	Age	Increase
0	8.65%	25	5.65%
1	7.15%	30	5.40%
2	5.65%	35	5.15%
3	5.65%	40	4.90%
4	5.65%	45	4.65%
5	5.65%	50	4.15%
6	5.65%	55	3.65%
7	5.65%	60	3.15%
8	5.65%	65	3.15%
9	5.65%		

Percent of Employees Currently Electing Coverage Assumed to Continue Coverage in Retirement

The table below summarizes the percent of active participants assumed to elect OPEB benefits upon decrement.

Service	Election Rate
0 – 14	35%
15 – 19	85%
20 - 24	95%
25 or more	100%

Opt-Out Opt-In Coverage

For actives who decrement prior to age 60, the people who elect OPEB coverage given above is further subdivided into two groups, one group that commences OPEB benefits immediately upon retirement, a second group that defers OPEB benefits until age 60. We assumed that the following percentage times the election rate above would defer OPEB benefits (opt-out of OPEB coverage at retirement) and rejoin the Plan at age 60.

Age at Retirement	
< 50	10%
50-54	10%
55-59	5%

Section IX. Valuation Methods and Assumptions – Schools (cont.)

Opt-Out Opt-In Coverage (cont.)

Participants who go from active to disabled status are assumed to take immediate OPEB benefits. In other words, we assume no disabled person elects to opt out.

Coverage Status and Age of Spouse

For active participants with spousal coverage, 25% are assumed to continue husband/wife coverage upon decrement. The remainder, 75%, are assumed to elect individual coverage upon decrement. Participants with individual coverage on valuation date are assumed to only elect individual coverage. Participants who waived medical coverage on valuation date are assumed to always waive the coverage in the future.

Females assumed 3 years younger than male spouse.

Decrement Assumptions

Below is a summary of decrements used in this valuation. Sample Retirement, Disability, and Termination rates are illustrated in the tables below.

Mortality Decrements		Description
(1)	Healthy – Pre Retirement	RP 2014 White Collar Employee table, fully generational using scale MP-2014
(2)	Healthy – Post Retirement	RP 2014 Healthy Annuitant Mortality table, fully generational using scale MP-2014 (in 2014 male table projected to 2012 and female to 2016)
(3)	Disabled	RP-2014 Disabled Annuitant Mortality, not fully generational set forward 1 year for males, none for females

Section IX. Valuation Methods and Assumptions – Schools (cont.)

Decrement Assumptions (cont.)

Rates of normal retirement

Age	At least 30 years of service		Less than 30 years of service	
	Male	Female	Male	Female
45	10.0%	9.0%	-	-
46	10.0%	9.0%	-	-
47	10.0%	9.0%	-	-
48	10.0%	9.0%	-	-
49	10.0%	9.0%	-	-
50	10.0%	9.0%	-	-
51	10.0%	9.0%	-	-
52	10.0%	9.0%	-	-
53	10.0%	9.0%	-	-
54	10.0%	9.0%	-	-
55	10.0%	10.0%	-	-
56	10.0%	10.0%	-	-
57	10.0%	10.0%	-	-
58	10.0%	10.0%	-	-
59	10.0%	11.0%	-	-
60	13.0%	15.0%	-	-
61	16.0%	18.0%	-	-
62	25.0%	25.0%	14.0%	21.0%
63	23.0%	23.0%	14.0%	16.0%
64	19.0%	23.0%	14.0%	16.0%
65	25.0%	25.0%	16.0%	18.0%
66	25.0%	25.0%	16.0%	22.0%
67	20.0%	25.0%	16.0%	20.0%
68	20.0%	25.0%	16.0%	18.0%
69	20.0%	25.0%	16.0%	18.0%
70	25.0%	25.0%	16.0%	20.0%
71	25.0%	25.0%	16.0%	20.0%
72	25.0%	25.0%	16.0%	15.0%
73	25.0%	25.0%	16.0%	15.0%
74	25.0%	25.0%	16.0%	15.0%
75 & over	100.0%	100.0%	100.0%	100.0%

Section IX. Valuation Methods and Assumptions – Schools (cont.)

Decrement Assumptions (cont.)

Reformed system -

Additional rate added to annual rate of normal retirement at age of first eligibility

	At least 30 years		Less than 30 years	
Age	**Male**	**Female**	**Male**	**Female**
55 and under	33.0%	30.0%	0.0%	0.0%
56	26.0%	23.0%	0.0%	0.0%
57	19.0%	17.0%	0.0%	0.0%
58	11.0%	9.0%	0.0%	0.0%
59	2.0%	1.0%	0.0%	0.0%
60	0.0%	0.0%	0.0%	0.0%
61	0.0%	0.0%	0.0%	0.0%
62	0.0%	0.0%	0.0%	0.0%
63	0.0%	0.0%	0.0%	0.0%
64	0.0%	0.0%	0.0%	0.0%
65 and over	0.0%	0.0%	20.0%	15.0%

Rates of early retirement

	Non-Reformed		Reformed	
Age	**Male**	**Female**	**Male**	**Female**
55	1.5%	2.0%		
56	1.5%	2.5%		
57	1.5%	3.0%		
58	2.5%	3.0%		
59	3.5%	3.5%		
60	3.5%	5.0%	8.0%	12.5%
61	6.5%	7.0%	6.5%	7.0%
62			7.0%	7.5%
63			7.5%	8.0%
64			8.0%	8.5%

Section IX. Valuation Methods and Assumptions – Schools (cont.)

Decrement Assumptions (cont.)

Rates of disability

Age	Male	Female
25	0.0292%	0.0389%
30	0.0292%	0.0389%
35	0.0292%	0.0494%
40	0.0961%	0.0861%
45	0.1922%	0.1638%
50	0.2872%	0.2762%
55	0.3833%	0.4641%
60	0.4164%	0.3969%

Annual rates of withdrawal for first 10 years of service

Service	Male	Female
0	20.00%	16.00%
1	16.00%	12.50%
2	14.00%	12.00%
3	11.00%	9.00%
4	8.00%	7.75%
5	6.50%	6.00%
6	5.75%	5.50%
7	4.75%	4.75%
8	3.75%	4.00%
9	3.00%	3.50%

Section IX. Valuation Methods and Assumptions – Schools (cont.)

Decrement Assumptions (cont.)

Annual rates of withdrawal after 10 years of service

Age	Male	Female
25	4.00%	3.50%
30	2.00%	2.75%
35	1.75%	2.00%
40	1.50%	1.75%
45	1.50%	1.25%
50	1.50%	1.00%
55	1.50%	1.00%
60	1.50%	1.00%
65	1.50%	1.00%

Claims Assumption

We received monthly enrollment and paid medical and prescription drug claims for pre and post age 65 retirees paid from January 1, 2015 – December 31, 2017. Claims and enrollments were divided into Medicare and Non-Medicare eligible retirees. The medical claims and prescription drugs were projected to Fiscal Year 2018 assuming 5% Pre-Age 65 and 5% Post-Age 65 annual increases.

Administrative expenses were assumed to be $43.12/month for Pre-Medicare retirees and $29.99/month for Post-Medicare retirees. There was a 20% adjustment for prescription drug rebates and a 3% medical adjustment for IBNR claims.

Family coverage was assumed to be 2.08 times the cost of the individual coverage for retirees less than age 65 and 2.00 for retirees age 65 or older.

The chart below shows the FYE 2018 cost of medical and drug broken down between the published per capita cost (i.e., the blended rates) and the hidden subsidy.

Section IX. Valuation Methods and Assumptions – Schools (cont.)

Claims Assumption

FYE 2018 Claims	Single	Family
1. Assumed Costs		
a. Under Age 65	6,722	13,983
b. Over Age 65	5,606	11,212
2. Total Costs		
a. Under Age 50	6,402	13,316
b. Ages 50-54	7,779	16,180
c. Ages 55-59	9,056	18,836
d. Ages 60-64	10,659	22,171
e. Ages 65-69	5,429	10,858
f. Ages 70-74	6,199	12,398
g. Ages 75-79	6,081	12,162
h. Ages 80-84	6,121	12,242
i. Age 85 and older	5,728	11,456

Note: Because there is no subsidy provided by Howard County Public Schools for dental or vision coverage, no liability was computed for dental coverage and vision coverage.

Aetna HMO monthly premium for individual medical coverage	
Pre-Medicare	497.08
Post-Medicare	407.60

Other Assumptions

- Active participant records missing salary were assigned the average salary for all of the active population.
- Surviving spouses are assumed to elect coverage until they reach age 65.
- No salary information was provided this year. We used the previous valuation salary provided for continuing actives, adjusted for inflation. For all other participants, an average salary of $68,000 was assumed.

Section IX. Valuation Methods and Assumptions – Schools (cont.)

Changes in assumptions and methods since prior valuation

- The payroll, decrement and mortality assumptions were updated to the most recent assumptions used by the State of Maryland Pension Plan.
- The claims assumption was updated to include the most recent plan experience.

Section X. Valuation Methods and Assumptions - College

Payroll Assumption

See the description for Howard County Schools

Percent of Employees Currently Electing Coverage Assumed to Continue Coverage In Retirement

The table below details the participant's election rates:

Years of Service	Election Percentage
0 – 9	0%
10 – 14	50%
15 - 19	65%
20 - 24	75%
25 - 29	85%
30 or more	95%

Coverage Status and Age of Spouse

Actual coverage status is used; females assumed 3 years younger than male spouse. Employees with family coverage are assumed to continue family coverage in retirement. Employees with individual coverage are assumed to elect individual coverage in retirement. Employees currently waiving coverage are assumed to continue to waive coverage in retirement.

Decrement Assumptions

Below is a summary of decrements used in this valuation. Sample Retirement, Disability, and Termination rates are illustrated in the tables below.

Mortality Decrements		Description
(4)	Healthy – Pre Retirement	RP 2014 White Collar Employee table, fully generational using scale MP-2014
(5)	Healthy – Post Retirement	RP 2014 Healthy Annuitant Mortality table, fully generational using scale MP-2014 (in 2014 male table projected to 2012 and female to 2016)
(6)	Disabled	RP-2014 Disabled Annuitant Mortality, not fully generational set forward 1 year for males, none for females

Section X. Valuation Methods and Assumptions – College (cont.)

Decrement Assumptions (cont.)

Rates of normal retirement

Age	At least 30 years of service		Less than 30 years of service	
	Male	Female	Male	Female
45	10.0%	9.0%	-	-
46	10.0%	9.0%	-	-
47	10.0%	9.0%	-	-
48	10.0%	9.0%	-	-
49	10.0%	9.0%	-	-
50	10.0%	9.0%	-	-
51	10.0%	9.0%	-	-
52	10.0%	9.0%	-	-
53	10.0%	9.0%	-	-
54	10.0%	9.0%	-	-
55	10.0%	10.0%	-	-
56	10.0%	10.0%	-	-
57	10.0%	10.0%	-	-
58	10.0%	10.0%	-	-
59	10.0%	11.0%	-	-
60	13.0%	15.0%	-	-
61	16.0%	18.0%	-	-
62	25.0%	25.0%	14.0%	21.0%
63	23.0%	23.0%	14.0%	16.0%
64	19.0%	23.0%	14.0%	16.0%
65	25.0%	25.0%	16.0%	18.0%
66	25.0%	25.0%	16.0%	22.0%
67	20.0%	25.0%	16.0%	20.0%
68	20.0%	25.0%	16.0%	18.0%
69	20.0%	25.0%	16.0%	18.0%
70	25.0%	25.0%	16.0%	20.0%
71	25.0%	25.0%	16.0%	20.0%
72	25.0%	25.0%	16.0%	15.0%
73	25.0%	25.0%	16.0%	15.0%
74	25.0%	25.0%	16.0%	15.0%
75 & over	100.0%	100.0%	100.0%	100.0%

Section X. Valuation Methods and Assumptions – College (cont.)

Decrement Assumptions (cont.)

Reformed system -

Additional rate added to annual rate of normal retirement at age of first eligibility

	At least 30 years		Less than 30 years	
Age	Male	Female	Male	Female
55 and under	33.0%	30.0%	0.0%	0.0%
56	26.0%	23.0%	0.0%	0.0%
57	19.0%	17.0%	0.0%	0.0%
58	11.0%	9.0%	0.0%	0.0%
59	2.0%	1.0%	0.0%	0.0%
60	0.0%	0.0%	0.0%	0.0%
61	0.0%	0.0%	0.0%	0.0%
62	0.0%	0.0%	0.0%	0.0%
63	0.0%	0.0%	0.0%	0.0%
64	0.0%	0.0%	0.0%	0.0%
65 and over	0.0%	0.0%	20.0%	15.0%

Rates of early retirement

	Non-Reformed		Reformed	
Age	Male	Female	Male	Female
55	1.5%	2.0%		
56	1.5%	2.5%		
57	1.5%	3.0%		
58	2.5%	3.0%		
59	3.5%	3.5%		
60	3.5%	5.0%	8.0%	12.5%
61	6.5%	7.0%	6.5%	7.0%
62			7.0%	7.5%
63			7.5%	8.0%
64			8.0%	8.5%

Section X. Valuation Methods and Assumptions – College (cont.)

Decrement Assumptions (cont.)

Rates of disability

Age	Male	Female
25	0.0292%	0.0389%
30	0.0292%	0.0389%
35	0.0292%	0.0494%
40	0.0961%	0.0861%
45	0.1922%	0.1638%
50	0.2872%	0.2762%
55	0.3833%	0.4641%
60	0.4164%	0.3969%

Annual rates of withdrawal for first 10 years of service

Service	Male	Female
0	20.00%	16.00%
1	16.00%	12.50%
2	14.00%	12.00%
3	11.00%	9.00%
4	8.00%	7.75%
5	6.50%	6.00%
6	5.75%	5.50%
7	4.75%	4.75%
8	3.75%	4.00%
9	3.00%	3.50%

Section X. Valuation Methods and Assumptions – College (cont.)

Decrement Assumptions (cont.)

Annual rates of withdrawal after 10 years of service

Age	Male	Female
25	4.00%	3.50%
30	2.00%	2.75%
35	1.75%	2.00%
40	1.50%	1.75%
45	1.50%	1.25%
50	1.50%	1.00%
55	1.50%	1.00%
60	1.50%	1.00%
65	1.50%	1.00%

Claims Assumption

See the description for Howard County Government.

Other Assumptions

- Retirees are assumed to not change their medical plan. For example, if a retiree has Aetna PPO as of valuation date, we assumed that the retiree will stay in Aetna PPO until age 65 and move to a Medicare Advantage plan closest to their active plan.
- Pre-65 retirees in the Aetna HMO plan are asked to switch to the Aetna Medicare 10 plan upon reaching age 65.

Changes in assumptions and methods since prior valuation

- The claims assumption was updated to include the most recent plan experience.
- The decrement and payroll assumptions were updated to the most recent assumptions used by the State of Maryland Pension Plan.

Section XI. Glossary

Actuarially Determined Contribution:

For Plans with irrevocable trusts, the recommended contribution to the Plan (determined in conformity with Actuarial Standards of Practice) that is projected to result in assets equaling the actuarial accrued liability within a period of time.

Covered Group:

Plan members included in an actuarial valuation.

Discount Rate:

The rate used to adjust a series of future payments to reflect the time value of money.

Election Rate:

The percentage of retiring employees assumed to elect coverage.

Employer's Contributions:

Contributions made in relation to the actuarially determined contributions of the employer (ADC). An employer has made a contribution in relation to the ADC if the employer has (a) made payments of benefits directly to or on behalf of a retiree or beneficiary, (b) made premium payments to an insurer, or (c) irrevocably transferred assets to a trust, or an equivalent arrangement, in which plan assets are dedicated to providing benefits to retirees and their beneficiaries in accordance with the terms of the plan and are legally protected from creditors of the employer(s) or plan administrator.

Entry Age Normal Funding Method:

A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit.

Funded Ratio:

The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Healthcare Cost Trend Rate:

The rate of change in per capita health claim costs over time as a result of factors such as medical inflation, utilization of healthcare services, plan design, and technological developments.

Section XI. Glossary (cont.)

Measurement Date:

A day selected by the local government from the last day of the prior fiscal year to the last day of the current fiscal year. The measurement date is not necessarily the same date as the valuation date.

OPEB Plan:

An OPEB plan having terms that specify the amount of benefits to be provided at or after separation from employment. The benefits may be specified in dollars (for example, a flat dollar payment or an amount based on one or more factors such as age, years of service, and compensation), or as a type or level of coverage (for example, prescription drugs or a percentage of healthcare insurance premiums).

Other Post-Employment Benefits:

Post-employment benefits other than pension benefits. Other post-employment benefits (OPEB) include post-employment healthcare benefits, life insurance, regardless of the type of plan that provides them, and all post-employment benefits provided separately from a pension plan, excluding benefits defined as termination offers and benefits.

Pay-as-you-go (PAYGO):

A method of financing a benefit plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

Payroll Growth Rate:

An actuarial assumption with respect to future increases in total covered payroll attributable to inflation; used in applying the level percentage of projected payroll amortization method.

Plan Liabilities:

Obligations payable by the plan at the reporting date, including, primarily, benefits and refunds due and payable to plan members and beneficiaries, and accrued investment and administrative expenses. Plan liabilities do not include actuarial accrued liabilities for benefits that are not due and payable at the reporting date.

Plan Members:

The individuals covered by the terms of an OPEB plan. The plan membership generally includes employees in active service, terminated employees who have accumulated benefits but are not yet receiving them, and retired employees and beneficiaries currently receiving benefits.

Section XI. Glossary (cont.)

Post-employment:

The period between termination of employment and retirement as well as the period after retirement.

Post-employment Healthcare Benefits:

Medical, dental, vision, and other health-related benefits provided to terminated or retired employees and their dependents and beneficiaries.

Select and Ultimate Rates:

Actuarial assumptions that contemplate different rates for successive years. Instead of a single assumed rate with respect to, for example, the investment return assumption, the actuary may apply different rates for the early years of a projection and a single rate for all subsequent years. For example, if an actuary applies an assumed investment return of 8% for year 2000, 7.5% for 2001, and 7% for 2002 and thereafter, then 8% and 7.5% are select rates, and 7% is the ultimate rate.

Service Cost:

That portion of the Actuarial Present Value of plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

Valuation Date:

The as-of date for employee census data. Under GASB 74 and 75, the valuation date must be within 30 months of the last day of the fiscal year.

Appendix 1. Discount Rate Determination for FYE 2018

Howard County OPEB Plan

For the June 30, 2018 Measurement Date

Table 1 - Projection of Employer Contributions

	Projected Contributions		
Fiscal Year Ending	Total County Contribution (a)	Contributions For Future Employees (b)	Contributions For Current Participants (c) = (a) - (b)
2019	$ 38,996,000	$ 1,182,814	$ 37,813,186
2020	$ 40,166,000	$ 2,299,701	$ 37,866,299
2021	$ 41,371,000	$ 3,458,804	$ 37,912,196
2022	$ 42,612,000	$ 4,614,734	$ 37,997,266
2023	$ 43,890,000	$ 5,809,183	$ 38,080,817
2024	$ 45,207,000	$ 7,115,643	$ 38,091,357
2025	$ 46,563,000	$ 8,422,048	$ 38,140,952
2026	$ 47,960,000	$ 9,898,469	$ 38,061,531
2027	$ 49,399,000	$ 11,415,236	$ 37,983,764
2028	$ 50,881,000	$ 12,985,549	$ 37,895,451
2029	$ 52,407,000	$ 14,725,250	$ 37,681,750
2030	$ 53,979,000	$ 16,559,843	$ 37,419,157
2031	$ 55,598,000	$ 18,519,426	$ 37,078,574
2032	$ 57,266,000	$ 20,642,198	$ 36,623,802
2033	$ 58,984,000	$ 22,881,664	$ 36,102,336
2034	$ 60,754,000	$ 25,190,154	$ 35,563,846
2035	$ 62,577,000	$ 27,718,726	$ 34,858,274
2036	$ 64,454,000	$ 30,322,840	$ 34,131,160

Note: Years subsequent to 2036 have been omitted from this table.

Appendix 1. Discount Rate Determination for FYE 2018 (cont.)

Appendix

Howard County OPEB Plan

For the June 30, 2018 Measurement Date

Table 2 - Projection of OPEB Plan's Fiduciary Net Position

Fiscal Year Ending	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions[1] (b)	Projected Benefit Payments (c)	Projected Investment Earnings (d)	Projected Ending Fiduciary Net Position (e) = (a) + (b) - (c) + (d)
2019	$ 129,326,886	$ 37,813,186	$ 25,996,000	$10,142,661	$ 151,286,733
2020	$ 151,286,733	$ 37,866,299	$ 28,348,000	$11,703,441	$ 172,508,473
2021	$ 172,508,473	$ 37,912,196	$ 30,868,000	$13,202,293	$ 192,754,962
2022	$ 192,754,962	$ 37,997,266	$ 33,367,000	$14,630,257	$ 212,015,485
2023	$ 212,015,485	$ 38,080,817	$ 36,097,000	$15,975,555	$ 229,974,857
2024	$ 229,974,857	$ 38,091,357	$ 39,044,000	$17,212,390	$ 246,234,604
2025	$ 246,234,604	$ 38,140,952	$ 42,223,000	$18,314,519	$ 260,467,075
2026	$ 260,467,075	$ 38,061,531	$ 45,652,000	$19,250,388	$ 272,126,994
2027	$ 272,126,994	$ 37,983,764	$ 49,083,000	$19,993,303	$ 281,021,061
2028	$ 281,021,061	$ 37,895,451	$ 52,746,000	$20,519,684	$ 286,690,196
2029	$ 286,690,196	$ 37,681,750	$ 56,740,000	$20,787,080	$ 288,419,026
2030	$ 288,419,026	$ 37,419,157	$ 60,931,000	$20,749,733	$ 285,656,916
2031	$ 285,656,916	$ 37,078,574	$ 65,540,000	$20,356,965	$ 277,552,455
2032	$ 277,552,455	$ 36,623,802	$ 70,572,000	$19,543,377	$ 263,147,634
2033	$ 263,147,634	$ 36,102,336	$ 75,695,000	$18,251,348	$ 241,806,318
2034	$ 241,806,318	$ 35,563,846	$ 80,996,000	$16,431,768	$ 212,805,932
2035	$ 212,805,932	$ 34,858,274	$ 86,474,000	$14,024,855	$ 175,215,061
2036	$ 175,215,061	$ 34,131,160	$ 91,910,000	$10,974,423	$ 128,410,644
2037	$ 128,410,644	$ 33,353,838	$ 97,603,000	$ 7,221,455	$ 71,382,937
2038	$ 71,382,937	$ 32,436,445	$103,817,000	$ 2,676,949	$ 2,679,331
2039	$ 2,679,331	$ 31,415,727	$110,243,000	$ (2,755,073)	$ -
2040	$ -	$ 30,415,685	$116,762,000	$ (3,237,987)	$ -
2041	$ -	$ 29,377,988	$123,475,000	$ (3,528,638)	$ -

Note: Years subsequent to 2041 have been omitted from the table.

[1] From Table 1, Column (c)

Appendix 1. Discount Rate Determination for FYE 2018 (cont.)

Howard County OPEB Plan

For the June 30, 2018 Measurement Date

Table 3 - Actuarial Value of Projected Benefit Payments

Fiscal Year Ending	Projected Beginning Fiduciary Net Position[1] (a)	Projected Benefit Payments (b)	"Funded" Portion of Benefit Payments (c)	"Unfunded" Portion of Benefit Payments (d)	Present Value of "Funded" Benefit Payments (e) = (c) / (1 + 7.5%)^(year-2018-0.5)		Present Value of "Unfunded" Benefit Payments (f) = (d) / (1 + 3.62%)^(year-2018-0.5)		Present Value of Benefit Payments Using the Single Discount Rate (g) = (b) / (1 + 3.98%)^(year-2018-0.5)
2019	$ 129,326,886	$ 25,996,000	$25,996,000	$ -	$ 25,072,769		$ -		$ 25,493,137
2020	$ 151,286,733	$ 28,348,000	$28,348,000	$ -	$ 25,433,711		$ -		$ 26,734,536
2021	$ 172,508,473	$ 30,868,000	$30,868,000	$ -	$ 25,762,460		$ -		$ 27,995,757
2022	$ 192,754,962	$ 33,367,000	$33,367,000	$ -	$ 25,905,235		$ -		$ 29,102,773
2023	$ 212,015,485	$ 36,097,000	$36,097,000	$ -	$ 26,069,519		$ -		$ 30,277,625
2036	$ 175,215,061	$ 91,910,000	$91,910,000	$ -	$ 25,924,754		$ -		$ 46,392,609
2037	$ 128,410,644	$ 97,603,000	$97,603,000	$ -	$ 25,609,823		$ -		$ 47,378,651
2038	$ 71,382,937	$103,817,000	$ -	$103,817,000	$ -		$ 51,894,163		$ 48,464,248
2039	$ 2,679,331	$110,243,000	$ -	$110,243,000	$ -		$ 53,181,119		$ 49,492,287
2113	$ -	$ 3,000	$ -	$ 3,000	$ -		$ 104		$ 75
2114	$ -	$ 1,000	$ -	$ 1,000	$ -		$ 34		$ 24
2115	$ -	$ -	$ -	$ -	$ -		$ -		$ -
Total					**$ 497,360,782**	**+**	**$ 1,662,391,041**	**=**	**$ 2,159,751,822**

Note: Years 2024-2035 and years 2040-2112 have been omitted from this table but included in the totals.

Note: 3.98% was selected so that the Present Value of Benefits would equal the sum of columns (f) and (g).

[1] From Table 2, Column (a)