



Frederick County Uniformed Employees Retirement Plan

Actuarial Valuation as of July 1, 2021 to Determine the County's Contribution for the Fiscal Year Ending June 30, 2023

Bolton

Submitted by:

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Employee Benefits, Actuarial & Investment Consulting

March 22, 2022

Wayne Howard
Director, Human Resources
Frederick County Government
Winchester Hall, Room 200
12 East Church Street
Frederick, MD 21701

Re: *Frederick County Uniformed Employees Retirement Plan*

Dear Wayne:

The following sets forth the actuarial valuation of the Frederick County Uniformed Employees Retirement Plan as of July 1, 2021. Section I of the report provides a summary and the Actuarial Certification, while Sections II through VI contain the development of the County's contribution for the 2022 fiscal year along with a summary of the census and asset data, plan provisions, assumptions and actuarial methods. Section VII provides a glossary of many of the terms used in this report. The appendices of the report provide information on plan funding as well as a 10-year projection of benefit payments and a discussion on risk.

We are available to answer any questions on the material in this report or to provide explanations or further details as appropriate. The undersigned credentialed actuaries meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services that could create a conflict of interest, which would impair the objectivity of our work.

Respectfully submitted,

Ann M. Sturner, FSA, EA, FCA, MAAA

James Ritchie, ASA, EA, FCA, MAAA

Jordan McClane, FSA, EA, FCA, MAAA



Section I. Executive Summary

Background

Bolton Partners, Inc. has prepared the following report that sets forth the actuarial valuation of the Frederick County Uniformed Employees Retirement Plan (the Plan) as of July 1, 2021.

Funding Policy Contribution

The County's funding policy is to contribute the maximum of:

- 1) The Actuarially Determined Contribution (ADC) as a percentage of payroll
- 2) Two times the expected employee contributions as a percentage of payroll
- 3) If the funded status, equal to the actuarial value of assets divided by the actuarial accrued liability based on the funding assumptions, is less than 95%, the ADC plus an annual amount that if contributed in addition to the ADC over the next five years is expected to bring the plan to a funded status of 100%

The ADC and funding policy contribution decreased substantially from FY2022 (20.0%) to FY2023 (17.9%) primarily due to the partial recognition of favorable FY2021 investment returns.

	FY2021	FY2022	FY2023
(1) ADC	18.0%	20.0%	17.9%
(2) 2 x Employee Contributions ¹	N/A	17.4%	17.5%
(3) < 95% Funded Contribution	N/A	N/A	N/A
(4) Funding Policy Contribution	18.0%	20.0%	17.9%
Max [(1), (2), (3)]			

Details of the determination of the County's contributions for FY2023 are shown in Section 2 of this report.

Funding Measures Projected Unit Credit Liability

Funding Measures	7/1/2020	7/1/2021	Percent Change
1. Actuarial Accrued Liability			
a. Active	\$ 180,634,388	\$ 193,810,179	7.3%
b. Terminated	2,661,010	2,413,473	-9.3%
c. Retired//Disabled	122,232,250	151,489,513	23.9%
d. Total	\$ 305,527,648	\$ 347,713,165	13.8%
2. Actuarial Value of Assets	304,513,582	341,206,289	12.0%
3. Plan Funded Ratio (2. / 1.d.)	99.7%	98.1%	
4. Market Value of Assets	305,518,347	389,993,511	27.6%
5. Funded Ratio if Market Value of Assets was Used (4. / 1.d.)	100.0%	112.2%	

¹ For FY2021, this contribution rate was based on aggregate employee contributions for both the non-uniformed and uniformed groups and it did not impact the contribution rates.



Section I. Executive Summary

Risk Measures

Appendix 3 contains important information about various risks common to most public pension plans. Because the information is too lengthy to include in this summary, we strongly recommend reviewing the Appendix and considering whether further risk assessments are necessary.

Generally, the risk that a plan sponsor incurs from a defined benefit plan is primarily the risk of substantial increases in annual contributions. These increases occur most frequently due to variation in the investment returns. This valuation reflects the smoothing of asset returns, which reduces the risk of wide year-by-year contribution changes but does not ultimately reduce the risk inherent in a defined benefit plan. The following table shows four commonly used measures of the relative riskiness of a pension plan, relative to the plan sponsor and the employee group covered by the plan.

Risk Measure	7/1/2019	7/1/2020	7/1/2021	Conservative Measures
Inactive Liability as a Percent of Total Liability	42%	41%	44%	<50%
Assets to Payroll	5.5	5.5	6.5	<5
Liabilities to Payroll	5.3	5.5	5.8	<5
Benefit Payments to Contributions	0.6	0.6	0.7	<3

Experience Analysis

The following factors affected the County's contribution as a percentage of payroll:

- On a market-value basis, investment returns during FY2021 were approximately \$63.4 million more than expected. A portion (\$12.7 million) of this gain is reflected in this valuation, while the remaining portion will be reflected in future valuations. As of July 1, 2021, there is a total of \$48.8 million in net deferred investment gains which will be reflected in future valuations.
- The plan experienced a gain of \$11.0 million on an actuarial-value basis due to (1) the recognition of outstanding investment gain bases (and the investment return associated with the dollars constituting those bases) established prior to the current valuation and (2) the 20% recognition of the FY2021 \$63.4 million investment gain. Both components were calculated pursuant to the actuarial value of assets smoothing mechanism.
- Offsetting a portion of the reduction in the calculated funding policy contribution due to favorable asset returns were actuarial liability losses of approximately \$14.4 million. The liability losses were largely the result of greater salary increases (11.1% aggregate, weighted by service) than were anticipated by the valuation assumptions (5.5% aggregate, weighted by service) for returning employees.



Section I. Executive Summary

Changes in Method, Assumptions, and Plan Amendments

There were no method or assumption changes since the prior valuation.

This July 1, 2021 valuation reflects the following plan changes since the prior valuation:

- The *Frederick County Employees Retirement Plan* split into the *Frederick County Employees Retirement Plan* (for non-uniformed employees) and the *Frederick County Uniformed Employees Retirement Plan* (for uniformed employees) effective July 1, 2021.
- A 2.0% ad hoc cost-of-living adjustment scheduled to be granted in addition to the annual 1.0% cost of living adjustment on July 1, 2022.

Projection of Expected Benefit Payments

The projection of expected benefit payments is shown in Appendix 2.

Sources of Information

The July 1, 2021 participant data and market value of assets were provided by or at the direction of Frederick County. While we have reviewed this data for consistency and completeness, we have not audited this data.

Impact of COVID-19

Because the long-term net impact of COVID-19 on mortality, salary increases, and changes in turnover and retirement behavior is difficult to estimate at this time, we have not made any adjustments to the assumptions for the potential impact of the COVID-19 pandemic.

Actuarial Certification

This actuarial valuation sets forth our calculation of an estimate of the liabilities of the Frederick County Uniformed Employees Retirement Plan, together with a comparison of these liabilities with the value of the plan assets, as submitted by Frederick County Government (the County). This calculation and comparison with assets are applicable for the valuation date only. The future is uncertain, and the plan may become better funded or more poorly funded in the future. This valuation does not provide any guarantee that the plan will be able to provide the promised benefits in the future.

This is a deterministic valuation in that it is based on a single set of assumptions. This set of assumptions is one possible basis for our calculations. Other assumptions may be equally valid. The future is uncertain and the plan's actual experience will differ from the assumptions; the differences may be significant or material because the results are very sensitive to the assumptions made and, in some cases, to the interaction between the assumptions. We may consider that some factors are not material to the valuation of the plan and may not provide a specific assumption for those factors. We may have used other assumptions in the past. We will likely consider changes in assumptions at a future date.



Section I. Executive Summary

Actuarial Certification

Different assumptions or scenarios within the range of possibilities may also be reasonable and results based on those assumptions would be different. As a result of the uncertainty inherent in a forward-looking projection over a very long period of time, no one projection is uniquely “correct” and many alternative projections of the future could also be regarded as reasonable. Two different actuaries could, quite reasonably, arrive at different results based on the same data and different views of the future. A “sensitivity analysis” shows the degree to which results would be different if you substitute alternative assumptions within the range of possibilities for those utilized in this report. We have not been engaged to perform such a sensitivity analysis and thus the results of such an analysis are not included in this report. At the County’s request, Bolton Partners, Inc. is available to perform such a sensitivity analysis.

The County is responsible for selecting the plan’s funding policy, actuarial valuation methods, asset valuation methods, and assumptions. The policies, methods and assumptions used in this valuation are those that have been so prescribed and are described in this report. The County is solely responsible for communicating to Bolton Partners, Inc. any changes required thereto.

The County could reasonably ask how the valuation would change if we used a different assumption set or if plan experience exhibited variations from our assumptions. This report does not contain such an analysis. That type of analysis would be a separate assignment.

In addition, decisions regarding benefit improvements, benefit changes, the trust’s investment policy, and similar issues should not be based on this valuation. These are complex issues and other factors should be considered when making such decisions. These other factors might include the anticipated vitality of the local economy and future growth expectations, as well as other economic and financial factors.

The cost of this plan is determined by the benefits promised by the plan, the plan’s participant population, the investment experience of the plan and many other factors. An actuarial valuation is a budgeting tool for the County. It does not affect the cost of the plan. Different funding methods provide for different timing of contributions to the plan. As the experience of the plan evolves, it is normal for the level of contributions to the plan to change. If a contribution is not made for a particular year, either by deliberate choice or because of an error in a calculation, that contribution can be made in later years. We will not be responsible for contributions that are made at a future time rather than an earlier time. The plan sponsor is responsible for funding the cost of the plan.

We make every effort to ensure that our calculations are accurately performed. We reserve the right to correct any potential errors by amending the results of this report or by including the corrections in a future valuation report.

Because modeling all aspects of a situation is not possible or practical, we may use summary information, estimates, or simplifications of calculations to facilitate the modeling of future events in an efficient and cost-effective manner. We may also exclude factors or data that are immaterial in our judgment. Use of such simplifying techniques does not, in our judgment, affect the reasonableness of valuation results for the plan.



Section I. Executive Summary

Actuarial Certification

The valuation was completed using both proprietary and third-party models (including software and tools). We have tested these models to ensure they are used for their intended purposes, within their known limitations, and without any known material inconsistencies unless otherwise stated.

This report is based on plan provisions, census data, and asset data submitted by the County. We have relied on this information for purposes of preparing this report but have not performed an audit. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. The plan sponsor is solely responsible for the validity and completeness of this information.

The County is solely responsible for selecting the plan's investment policies, asset allocations and individual investments. Bolton Partners, Inc.'s actuaries have not provided any investment advice to the County.

The information in this report was prepared for the internal use of the County and its auditors in connection with our actuarial valuations of the pension plan. It is neither intended nor necessarily suitable for other purposes. Bolton Partners, Inc. is not responsible for the consequences of any other use or the reliance upon this report by any other party.

The only purpose of this report is to provide the recommended employer contribution for the 2023 fiscal year. This report may not be used for any other purpose; Bolton Partners, Inc. is not responsible for the consequences of any unauthorized use.

The calculation of actuarial liabilities for valuation purposes is based on a current estimate of future benefit payments. The calculation includes a computation of the "present value" of those estimated future benefit payments using an assumed discount rate; the higher the discount rate assumption, the lower the estimated liability will be. For purposes of estimating the liabilities (future and accrued) in this report, you selected an assumption based on the expected long-term rate of return on plan investments. Using a lower discount rate assumption, such as a rate based on long-term bond yields, could substantially increase the estimated present value of future and accrued liabilities.

Because valuations are a snapshot in time and are based on estimates and assumptions that are not precise and will differ from actual experience, contribution calculations are inherently imprecise. There is no uniquely "correct" level of contributions for the coming plan year.

This report provides certain financial calculations for use by the auditor. These values have been computed in accordance with our understanding of generally accepted actuarial principles and practices and fairly reflect the actuarial position of the Plan. The various actuarial assumptions and methods which have been used are, in our opinion, appropriate for the purposes of this report.



Section I. Executive Summary

Actuarial Certification

The report is conditioned on the assumption of an ongoing plan and is not meant to present the actuarial position of the plan in the case of plan termination. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status), and changes in plan provisions or applicable law.

The County should notify Bolton Partners, Inc. promptly after receipt of this report if the County disagrees with anything contained in the report or is aware of any information that would affect the results of the report that has not been communicated to Bolton Partners, Inc. or incorporated therein. The report will be deemed final and acceptable to the County unless the County promptly provides such notice to Bolton Partners, Inc.

The undersigned credentialed actuaries jointly and individually meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. We are currently compliant with the Continuing Professional Development Requirement of the Society of Actuaries. We are not aware of any direct or material indirect financial interest or relationship, including investments or other services, which could create a conflict of interest that would impair the objectivity of our work.

We are available to answer any questions on the material in this report to provide explanations or further details as appropriate.

Ann M. Sturner, FSA, EA, FCA, MAAA

James Ritchie, ASA, EA, FCA, MAAA

Jordan McClane, FSA, EA, FCA, MAAA



Section II. Determination of County Contributions

Derivation of Liabilities

Below is a summary of the actuarial accrued liability of the future benefits expected to be paid from the plan.

Actuarial Accrued Liability	7/1/2020	7/1/2021
1. Active Participants		
a. Retirement Benefits	\$ 168,446,164	\$ 180,441,747
b. Termination Benefits	4,272,080	4,715,285
c. Disability Benefits	6,582,766	7,193,621
d. Death Benefits	1,333,378	1,459,526
e. Total Active Participants	\$ 180,634,388	\$ 193,810,179
2. Terminated Participants	2,661,010	2,413,473
3. In-Pay Participants		
a. Retirees	\$ 113,228,136	\$ 140,119,065
b. Beneficiaries	4,628,495	5,077,630
c. Disabled Participants	4,375,619	6,292,818
d. Total In-Pay Participants	\$ 122,232,250	\$ 151,489,513
4. Total Actuarial Accrued Liability (1.e. + 2. + 3.d.)	\$ 305,527,648	\$ 347,713,165

Projected Unfunded Liability

Below is a summary of the projected unfunded liability for the following plan year.

Projected Unfunded Liability	
1. Actuarial Liability at July 1, 2021	
a. Active Participants	\$ 193,810,179
b. Terminated Participants	2,413,473
c. Retired Participants, Beneficiaries, and Disabled Participants	151,489,513
d. Total	\$ 347,713,165
2. Actuarial Value of Assets at July 1, 2021	\$ 341,206,289
3. Unfunded Liability at July 1, 2021	\$ 6,506,876
4. Expected FY2022	
a. Benefit Normal Cost	\$ 13,427,984
b. County Contributions	\$ 11,947,976
c. Participant Contributions	\$ 5,222,479
d. Expenses	\$ 372,078
5. Projected Unfunded Liability at July 1, 2022	\$ 3,953,924
6. Impact of Plan Change (2% ad -hoc COLA) as of July 1, 2022	\$ 2,959,835
7. Impact of Assumption Changes as of July 1, 2022	\$ 0
8. Expected Unfunded Liability at July 1, 2022	\$ (1,489,258)
9. Actuarial (Gain)/Loss at July 1, 2022 [(5. – 6 – 7.) – 8]	\$ 2,483,347



Section II. Determination of County Contributions

Actuarial Gain/Loss

Below is the derivation of this year's actuarial (Gain)/Loss as of July 1, 2021.

Derivation of Actuarial (Gain)/Loss		
1. Unfunded Actuarial Liability as of July 1, 2020	\$	1,014,066
2. Normal Cost as of July 1, 2020		13,251,081
3. Interest $([1. + 2.] \times 0.07)$		998,560
4. Contributions, adjusted with interest to June 30, 2021		15,182,099
5. Administrative expenses, adjusted with interest to June 30, 2021		334,237
6. Expected Unfunded Actuarial Liability $(1. + 2. + 3. - 4. + 5.)$	\$	415,845
7. Actual Unfunded Actuarial Liability as of July 1, 2021		6,506,876
8. Impact of Plan Change (2% ad -hoc COLA) as of July 1, 2021		2,766,201
9. Impact of Assumption Changes as of July 1, 2021		0
10. Actuarial (Gain)/Loss ² for 2020-2021 $[(7. - 8 - 9.) - 6.]$	\$	3,324,830

Actual Experience

There was an actuarial loss of \$3,324,830 for the 2021 fiscal year. The loss is measured by comparing the expected funded position to the actual funded position before any changes are made to the valuation, such as plan and assumption changes reflected in the current valuation. The individual sources of gains and losses that follow are based upon a comparison of actual and expected experience in the year ending on the valuation date.

Source		(Gain) or Loss
Investments	\$	(11,029,183)
Salaries (actual FY2021 plus expected FY2022)		9,023,074
Mortality		264,285
Turnover		2,296
Disability		(194,963)
Retirement		6,858,681
Miscellaneous		(1,599,360)
Total	\$	3,324,830

² The actuarial (gain)/loss of \$2,483,347 presented on the previous page is equal to the sum of:

- (1) This amount of \$3,324,830 as of July 1, 2021 rolled forward to July 1, 2022, and
- (2) The expected FY2022 "contribution" (gain)/loss due to the sum of the expected FY2022 contributions to the plan (exceeding)/falling short of the amount necessary to align with expected FY2022 plan experience.



Section II. Determination of County Contributions

Normal Cost

Normal Cost	7/1/2020	7/1/2021
1. Retirement Benefits	\$ 11,828,571	\$ 11,918,037
2. Termination Benefits	620,604	647,949
3. Disability Benefits	659,650	709,735
4. Death Benefits	142,256	152,263
5. Total Benefit Normal Cost	\$ 13,251,081	\$ 13,427,984
6. Estimated Expenses	493,940	372,078
7. Total Normal Cost for Plan Year	\$ 13,745,021	\$ 13,800,062
8. Projected Normal Cost for Following Plan Year	\$ 14,555,989	\$ 14,618,645

Funding Policy Contribution

The County's funding policy is to contribute the maximum of:

- 1) The Actuarially Determined Contribution (ADC) as a percentage of payroll
- 2) Two times the expected employee contributions as a percentage of payroll
- 3) If the funded status, equal to the actuarial value of assets divided by the actuarial accrued liability based on the funding assumptions, is less than 95%, the ADC plus an annual amount that if contributed in addition to the ADC over the next five years is expected to bring the plan to a funded status of 100%

The following table shows the derivation of the ADC and Funding Policy contribution for FY2023. The dollar amounts shown below are based on the estimated FY2023 payroll. The actual FY2023 County contribution will be based on the percentages shown and actual FY2023 payroll.

Funding Policy Contribution	
1. Estimated FY2023 Payroll	\$ 61,233,375
2. Normal Cost (with Estimated Expenses)	14,618,645
3. Amortization Amount	\$ 1,719,124
4. Total	16,337,769
5. Expected Participant Contributions	\$ 5,353,041
6. Actuarially Determined Contribution (ADC)	
a. Dollars (4. - 5.)	10,984,728
b. Percentage of Payroll (6.a. / 1.)	17.9%
7. Minimum Contribution	
a. Expected Participant Contributions Times Two (5. X 2)	\$ 10,706,082
b. Minimum Contribution as a Percentage of Payroll (7.a. / 1.)	17.5%
8. Alternative Minimum Contribution If Less Than 95% Funded	
a. Net Normal Cost (2. - 5.)	\$ N/A
b. Unfunded Liability	N/A
c. Five-Year Amortization of 8.b.	N/A
d. Alternative Minimum Contribution (8.a. + 8.c.)	\$ N/A
e. Alternative Minimum Contribution as a Percental of Payroll (8.d. / 1.)	N/A
9. Frederick County Funding Policy Contribution	
a. Dollars (Greatest of 6.a., 7.a., and 8.d.)	\$ 10,984,728
b. Percentage of Payroll (9.a. / 1.)	17.9%



Section II. Determination of County Contributions

Schedule of Amortization Bases

Below is a schedule of the amortization bases as of July 1, 2022.

Description	Date Established	Remaining Years	Amount to be Amortized	Payment / (Credit)
Assumption Change	7/1/2020	13	\$ 4,191,265	\$ 426,045
Plan Change (DROP)	7/1/2021	14	\$ 11,615,147	\$ 1,117,850
Ad-hoc COLA	7/1/2022	3	\$ 2,959,835	\$ 1,064,709
Surplus	7/1/2022	30	\$ (14,812,323)	\$ (889,480)
Totals			\$ 3,953,924	\$ 1,719,124



Section III. Valuation of Assets

Reconciliation of Assets

Below is a reconciliation of assets (unaudited) from July 1, 2019 through June 30, 2021.

	FY2020	FY2021
1. Beginning of Year Assets	\$ 286,907,923	\$ 305,518,347
2. Additions		
a. Employer Contributions	\$ 8,702,203	\$ 9,824,170
b. Employee Contributions	4,460,802	4,852,919
c. Investment Income & Dividends	6,894,781	7,260,560
d. Increase/(Decrease) in Market Value of Investments	8,283,202	78,549,152
e. Total Additions	\$ 28,340,989	\$ 100,486,801
3. Deductions		
a. Benefit Payments	\$ 8,509,541	\$ 10,151,013
b. Administrative Expenses	384,617	323,119
c. Investment Expenses	836,407	872,852
d. Total Deductions	\$ 9,730,565	\$ 11,346,984
4. Net Increase (2.e. – 3.d.)	\$ 18,610,424	\$ 89,139,817
5. Adjustment from Asset Split	N/A	(4,664,654)
6. Net Assets (1. + 4. + 5.)	\$ 305,518,347	\$ 389,993,511
7. Rate of Return Net of Investment Fees (2I / [A + B – I] Method)	5.0%	27.6%
8. Expected Market Value of Assets	\$ 309,803,869	\$ 331,252,205
9. Actuarial (Gain)/Loss [8. – (6. – 5.)]	\$ 5,890,761	\$ (63,405,960)



Section III. Valuation of Assets

Calculation of Actuarial Asset Value

The actuarial asset value as of July 1, 2021 is determined by spreading the asset gain or loss for each year over a five-year period. The asset gain or loss is the amount by which the actual asset return differs from the expected asset return.

					7/1/2021
1.	Market Value of Assets				\$ 389,993,511
2.	Spreading of Investment (Gain)/Loss				
	BOY	EOY	(Gain)/Loss	% Deferred	Amount Deferred
	2020	2021	\$ (63,405,960)	80%	\$ (50,724,768)
	2019	2020	5,921,876	60%	3,553,125
	2018	2019	(584,831)	40%	(233,933)
	2017	2018	(6,908,229)	20%	(1,381,646)
	a. Total Deferred				(48,787,222)
3.	Preliminary Actuarial Value of Assets (1. + 2.a.)				\$ 341,206,289
4.	Minimum Actuarial Value of Assets (0.5 x 1.)				\$ 194,996,756
5.	Maximum Actuarial Value of Assets (1.5 x 1.)				\$ 584,990,267
6.	Actuarial Value of Assets (3., but not less than 4. or more than 5.)				\$ 341,206,289
7.	Rate of Return Net of investment Fees				12.2%



Section III. Valuation of Assets

Reconciliation of Actuarial Asset Value

Below is a reconciliation of the Actuarial Asset Value from July 1, 2020 through June 30, 2021.

Actuarial Value of Assets		FY2021
1. Actuarial Value of Assets as of July 1, 2020	\$	304,513,582
2. Contributions to the Plan		
a. County	\$	9,824,170
b. Employee		4,852,919
c. Total Contributions	\$	14,677,089
3. Plan Disbursements Not Related to Investments		
a. Benefit Payments	\$	10,151,013
b. Administrative Expenses		323,119
c. Total Disbursements	\$	10,474,132
4. Expected Actuarial Value of Assets (1. x 1.07 + [2.c. - 3.c.] x 1.03441)	\$	330,177,106
5. Actuarial Value of Assets as of July 1, 2021	\$	341,206,289
6. (Gain)/Loss Due to Assets (4. - 5.)	\$	(11,029,183)
7. Rate of Return Net of Investment Fees (2I / [A + B - I] Method)		12.2%

Recognition of Deferred Asset Gains and Losses

The table below shows the valuation years (2022 to 2025) in which the \$(48,787,222) in net deferred asset gains will be recognized.

FYE	(Gain)/Loss	2022	2023	2024	2025
2018	\$ (6,908,229)	\$ (1,381,646)			
2019	\$ (584,831)	\$ (116,966)	\$ (116,967)		
2020	\$ 5,921,876	\$ 1,184,375	\$ 1,184,375	\$ 1,184,376	
2021	\$ (63,405,960)	\$ (12,681,192)	\$ (12,681,192)	\$ (12,681,192)	\$ (12,681,192)
Total		\$ (12,995,429)	\$ (11,613,784)	\$ (11,496,816)	\$ (12,681,192)



Section IV. Participant Information

Participant Summary

The following table summarizes the counts, ages and benefit information for plan participants used in this valuation.

	July 1, 2020		July 1, 2021	
1. Actives				
a. Number		795		776
b. Average Age		36.69		36.90
c. Average Service		9.91		10.15
d. Average Salary	\$	70,045	\$	76,984
2. Members in DROP				
a. Number		0		4
b. Average Age		N/A		54.55
c. Total Annual Benefits		N/A		188,407
3. Service Retirements and Beneficiaries				
a. Number		229		259
b. Average Age		57.56		57.76
c. Total Annual Benefits	\$	8,327,988	\$	9,986,469
4. Disability Retirements and Beneficiaries				
a. Number		15		20
b. Average Age		57.53		56.70
c. Total Annual Benefits	\$	467,776	\$	618,777
5. Vested Terminations				
a. Number		21		22
b. Average Age		41.67		40.36
c. Total Annual Benefits	\$	275,684	\$	274,687
6. Former Members Owed Refunds				
a. Number		40		63
b. Total Refunds Owed	\$	237,921	\$	310,440



Section IV. Participant Information

Active Age/Service Distribution Including Compensation

Shown below is the distribution of active participants based on age and service. The compensation shown is the average projected pay for the plan year beginning July 1, 2021.

	Years of Service as of 07/01/2021								Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35+	
Under 20									0
									0
20 - 24	60								60
	51,771								51,771
25 - 29	106	39							145
	54,658	68,676							58,429
30 - 34	54	76	33	2					165
	56,432	72,669	83,675	86,785					69,728
35 - 39	26	23	61	46					156
	54,961	74,998	85,710	93,848					81,405
40 - 44	6	7	18	54	12	2			99
	51,198	65,236	82,540	98,336	105,700	104,273			91,279
45 - 49	2	7	15	21	26	4			75
	61,506	67,672	82,092	93,032	113,105	122,758			96,180
50 - 54	1	2	3	12	14	7	1		40
	57,747	71,719	78,114	92,557	101,855	118,384	103,901		97,619
55 - 59				5	3		4	1	13
				94,912	101,618		136,987	119,769	111,318
60 - 64	2	1	1	7	3	1	1	1	17
	86,931	62,515	85,553	99,875	94,983	93,283	144,920	192,888	102,182
65 - 69				2	2		1	1	6
				85,328	97,665		127,813	124,159	102,993
70 & Up									0
									0
Totals	257	155	131	149	60	14	7	3	776
	54,623	71,371	84,172	95,365	107,004	115,825	132,083	145,606	76,984

Averages	
Age	36.90
Service	10.15



Section IV. Participant Information

Participant Reconciliation

Shown below is the reconciliation of participants between the prior and current valuation dates.

	Active Participants	DROP	Retirees & Beneficiaries	Disabled & Beneficiaries	Inactive Participants Terminated Vested	Refunds Owed	Transferred to Non-Ben	Total
Participants in Last Valuation	795	0	229	15	21	40	1	1,101
New participants	56	-	-	-	-	-	-	56
Return to active status	2	-	-	-	-	(2)	-	-
Grant Funded participants	-	-	-	-	-	-	-	-
Transferred to Non-Benefitted	-	-	-	-	-	-	-	-
Nonvested termination	(31)	-	-	-	-	31	-	-
Vested termination	(3)	-	-	-	3	-	-	-
Retired	(28)	-	29	-	(1)	-	-	-
Disabled	-	-	-	-	-	-	-	-
Entered DROP	(4)	4	-	-	-	-	-	-
Return of employee contributions	(11)	-	-	-	-	(9)	-	(20)
Adjustments	-	-	-	5	(1)	3	-	7
Died with survivor benefits	-	-	(1)	-	-	-	-	(1)
Died without survivor benefits	-	-	-	-	-	-	-	-
Beneficiary	-	-	1	-	-	-	-	1
QDRO	-	-	1	-	-	-	-	1
Participants in This Valuation	776	4	259	20	22	63	1	1,145



Section IV. Participant Information

Retiree and Beneficiary Distribution

Shown below is the monthly benefits of retirees and their beneficiaries by age.

Age Nearest Birthday	Number of Participants	Monthly Pension	Average Monthly Pension
49 and under	38	\$ 139,094	\$ 3,660
50 – 54	70	239,441	3,421
55 – 59	55	178,324	3,242
60 – 64	36	110,352	3,065
65 – 69	29	95,350	3,288
70 – 74	19	39,123	2,059
75 and over	12	30,521	2,543
Total	259	\$ 832,206	\$ 3,213

Disability Participant Distribution

Shown below is the monthly benefits of disabled participants and their beneficiaries by age.

Age Nearest Birthday	Number of Participants	Monthly Pension	Average Monthly Pension
39 and under	2	\$ 7,129	\$ 3,564
40 – 44	1	3,229	3,229
45 – 49	3	8,889	2,963
50 – 54	3	7,135	2,378
55 – 59	4	9,695	2,424
60 – 64	1	2,141	2,141
65 – 69	3	7,211	2,404
70 and over	3	6,136	2,045
Total	20	\$ 51,565	\$ 2,578

Terminated Vested Participant Distribution

Shown below is the monthly benefits of terminated vested participants by age.

Age Nearest Birthday	Number of Participants	Monthly Pension	Average Monthly Pension
29 and under	1	\$ 795	\$ 795
30 – 34	4	3,012	753
35 – 39	4	5,788	1,447
40 – 44	6	6,017	1,003
45 – 49	6	6,221	1,037
50 – 54	1	1,057	1,057
55 – 59	0	-	-
60 and over	0	-	-
Total	22	\$ 22,891	\$ 1,040



Section V. Summary of Plan Provisions

Effective Date

July 1, 2021.

Plan Year

July 1 – June 30.

Eligibility

All Uniformed employees who work at least 50% of the hours normally worked by other employees in the same position are eligible to participate. Participation starts on the date of employment.

Service

Prior to July 1, 1993

Prior to July 1, 1993: as defined by the Maryland State Retirement System

Creditable From July 1, 1993

A plan year in which the employee completes the required number of hours in a full-time schedule. Partial credit is granted in plan years where the employee completes at least 700 hours (except for the years of hire and termination). The amount of partial credit is determined by the ratio of actual hours to full-time hours.

Eligibility From July 1, 1993

A plan year in which the employee completes at least 700 hours. During the year of termination, fractional credit is based on the number of completed whole months. In the year of employment, fractional credit is based on the number of months, where working one day during the month is equivalent to working the entire month.

For purposes of normal, early and delayed retirement, credit for unused sick leave is determined by dividing the number of sick leave hours by the number of hours in the participant's regularly scheduled workday. This result is divided by 22 then divided by 12 and rounded to four decimal places. The maximum amount of Creditable Service for unused sick leave is two years.

Credit for Other Service

A participant may receive transferred service credit for service earned in a defined benefit plan sponsored by the State of Maryland or another Maryland county or municipal employer if the participant does not have a break in employment and satisfies several other requirements.

A participant may receive up to five years of service credit for pre-employment military service once the participant has earned ten years of Eligibility Service based on employment with the County. A participant may also receive credit for up to five years of service, if the participant's employment with the County is interrupted by military service and the participant returns to County employment within one year of their discharge from the Armed Services.

A participant may receive up to ten years of service credit for service earned with other governmental or educational employers. To receive this credit, a participant must pay the full cost of the service and must not be eligible to receive a pension for the service from the prior employer.



Section V. Summary of Plan Provisions

Employee Contributions

Participants contribute 9% of compensation (was 8% prior to July 1, 2012).

Contributions stop once an employee has 28 years of Creditable Service.

Employee contributions are “picked-up” by the County.

Upon leaving employment for any reason, accumulated contributions are returned if not eligible for plan benefits. Furthermore, plan benefits must be at least equal to the actuarial equivalent of accumulated contributions. Accumulated contributions are credited with interest of 4% each July 1 and cease on July 1 following twelve months after termination.

Members who receive their accumulated contributions forfeit any additional plan benefits.

Highest Average Compensation

Average compensation for the 36 consecutive months of employment with the County which produce the highest average.

Compensation is base salary excluding overtime, bonuses, etc.

Normal Form

Life annuity with guaranteed return of employee contributions, if not withdrawn.

Normal Retirement Date

First of the month coincident with or immediately following the earlier of:

Hired prior to July 1, 2011

- a. Attainment of age 50 and completion of 5 years of Eligibility Service.
- b. The completion of 20 years of Eligibility Service.

Hired after June 30, 2011

- a. Attainment of age 55 and completion of 5 years of Eligibility Service
- b. The completion of 25 year of Eligibility Service.

Normal Retirement Benefit

2.50% of Highest Average Compensation multiplied by Creditable Service not greater than 20 years plus 2.00% of Highest Average Compensation multiplied by Creditable Service in excess of 20 years, but not greater than 8 years (plus unused sick leave not greater than 2 years).

Early Retirement Date

Not available.

Late Retirement

A participant who defers retirement until after normal retirement date will receive a benefit determined on the basis of Highest Average Compensation and Creditable Service as of his actual retirement date (limited to 28 years, plus unused sick leave not greater than 2 years).



Section V. Summary of Plan Provisions

Disability Retirement

A participant who becomes totally and permanently disabled may retire prior to normal retirement and receive a benefit. The amount of the benefit depends upon the cause of disability.

Ordinary Disability

If vested, the lesser of:

- a. 50% of Highest Average Compensation
- b. The benefit the participant would have earned by age 50 for employees hired before July 1, 2011 or 55 if hired after June 30, 2011.

If not vested, a return of employee contributions with interest.

Line of Duty Disability

Participants must be vested to be eligible for this benefit

The greater of:

- a. The Ordinary Disability Benefit
- b. The lesser of:
 - i. 66⅔% of Highest Average Compensation
 - ii. 100% of Highest Average Compensation less any Social Security disability benefits.

To be eligible for Line of Duty Disability, the disability must be ruled compensable under Workers' Compensation.

Disability benefits are reduced by \$1.00 for each \$1.00 of Workers' Compensation benefits.

The following provisions apply to the disability benefits:

- Line of Duty benefits are split into "Catastrophic" and "Non- Catastrophic" benefits.
- To be eligible for "Catastrophic" Line of Duty Disability benefits, a participant must be eligible for Social Security disability benefits.
- "Catastrophic" Line of Duty Disability benefits are 66⅔% of Highest Average Compensation as of Date of Disability.
- "Non-Catastrophic" Line of Duty Disability benefits are 66⅔% of Highest Average Compensation as of Date of Disability. The monthly payment changes to a projected retirement benefit (based on projected Highest Average Compensation adjusted with inflation and Service) at the participant's Normal Retirement Date (based on age or projected service).
- There is no earned income offset for participants collecting a Catastrophic Line of Duty Disability benefit. For Ordinary and Non-Catastrophic Line of Duty:
 - The earned income offset is eliminated when the participant reaches his/her Normal Retirement Date (based on age or projected service).
 - A participant can earn up to 25% of their Highest Average Compensation (adjusted with inflation) before an earned income offset applies.
 - Earned income above the 25% of Highest Average Compensation threshold reduces the disability benefit \$1.00 for every \$2.00 earned.



Section V. Summary of Plan Provisions

Preretirement Death Benefit Eligibility

100% vested or die in the line of duty.

Preretirement Death Benefit

Annuity calculated as if participant had become disabled and elected a 100% Joint and Survivor Annuity.

Termination Benefits

Participants who have completed at least 5 years of Eligibility Service are entitled to a benefit beginning at normal retirement date which is equal to the accrued benefit at termination.

Actuarial Equivalence

Mortality: Pub-2010 General Retirees Amount-Weighted Mortality with MP-2018 improvement scale projected to 2035, blended 50% male/50% female

Interest: 7%

COLA: 1%

Cost-of-Living Adjustment (COLA)

Effective each July 1, the level of retirement benefits paid to retirees who retired at least 12 months earlier is increased by 1%. This provision was effective July 1, 1998.

Effective July 1, 2019, the following ad-hoc COLAs are in addition to, and applied after, the annual 1% COLA. "Year 1" is the plan year beginning July 1, 2019.

Participant's Initial Retirement Date	Year 1	Year 2	Year 3
After 12/31/2018	0%	0%	0%
Between 1/1/2014 and 12/31/2018	1%	1%	1%
Between 1/1/2009 and 12/31/2013	2%	1%	1%
On or before 12/31/2008	3%	2%	0%

Further, a 2% ad-hoc COLA will be applied as of July 1, 2022 in addition to the 1% COLA.

Optional Forms

10 Year Certain and Continuous.

50% or 100% Joint and Survivor (with or without pop-up).

Lump Sum (for return of employee contributions only).

DROP

Allows accumulation of pension after reaching the service only requirement for normal retirement.

DROP period must be between one and three years and member must exit DROP by 28 years of eligibility service. DROP account is invested in individually directed accounts. Regular annual 1% COLA included during the DROP period.

Changes in Plan Provisions Since Prior Valuation

Effective July 1, 2021, the plan split into the non-uniformed (*Frederick County Employees Retirement Plan*) and uniformed (*Frederick County Uniformed Employees Retirement Plan*) plans.

This valuation reflects the A 2% ad-hoc COLA that will be applied in addition to the 1% plan COLA as of July 1, 2022.

Section VI. Actuarial Methods and Assumptions

Actuarial Cost Method

Liabilities are computed using the Projected Unit Credit method. The actuarial accrued liability reflects each participant's benefits under the Plan as they would accrue; taking into consideration future salary increases and the Plan's benefit formula. Thus, the total pension to which each participant is expected to become entitled at retirement is broken down into units, each associated with a year of past or future credited service.

A description of the calculation follows:

An individual's accrued benefit for valuation purposes related to a particular separation date is the accrued benefit described under the Plan as of the separation date, multiplied by the ratio of service on the valuation date over service as of the expected separation date.

An individual's actuarial accrued liability is the present value of the accrued benefit for valuation purposes at the beginning of the plan year, and the normal cost is the present value of the benefit deemed to accrue in the plan year. Because multiple decrements are used, the actuarial accrued liability and the normal cost for an individual are the sum of the component actuarial accrued liabilities and normal costs associated with the various anticipated separation dates. Such actuarial accrued liabilities and normal costs reflect the accrued benefits as modified to obtain the benefits payable on those dates and the probability of the individual separating on those dates.

The Plan's normal cost is the sum of the individual normal costs, and the Plan's actuarial accrued liability (AAL) is the sum of the actuarial accrued liabilities for all participants under the Plan.

Amortization of Unfunded Actuarial Accrued Liability

Actuarial gains/losses and assumption changes are amortized over a closed 15-year period effective with each valuation. Plan changes are amortized over a closed 15-year period (with exception of any Early Retirement Incentives and ad-hoc cost-of-living adjustments, which are amortized over a closed period of up to 5 years and 3 years, respectively). Actuarial surplus is amortized over an open 30-year period. Upon reaching a surplus position, all prior bases are eliminated. When in a surplus position, the impact of plan changes and assumption changes which increased the UAAL are still amortized separately in layers, but gains/losses are rolled into the open surplus amortization. All bases are amortized as a level percent of payroll, which is assumed to increase 2.5% per year.

Actuarially Determined Contribution (ADC)

The ADC is equal to the employer normal cost, including expected administrative expenses, plus the sum of the layered amortization amounts.

Funding Policy

The County's funding policy is to contribute the maximum of:

- 1) The Actuarially Determined Contribution (ADC) as a percentage of payroll
 - 2) Two times the expected employee contributions as a percentage of payroll
- If the funded status of the plan is less than 95%, the ADC plus an annual amount that if contributed in addition to the ADC over the next five years is expected to bring the plan to full funding (a funded status of 100%)

Section VI. Actuarial Methods and Assumptions

Method for Allocating the Market Value of Assets

Initially, the market value of assets was allocated to each group based on their portion of the plan's liabilities. Since then, the assets for each group have been rolled forward each year based on the following:

- Annuity payments are allocated to each group based on the split of benefit payments between each group on the current valuation date. Cash outs are based on the group of the participant receiving the cash out.
- Fiscal year employee and County contributions are split based on the split of payroll during the fiscal year. Purchased and transferred employee contributions are allocated to the group of the impacted participant.
- Administrative expenses are allocated based on the prior year actual payroll
- Investment return rate for each group is equal to the investment return rate for the plan
- Investment expenses are allocated based on the allocated investment income

On July 1, 2021, 57.93% of the market value of assets was allocated to the Frederick County Employees Retirement Plan (non-uniformed) and 42.07% was allocated to the Frederick County Uniformed Employees Retirement Plan (uniformed). After July 1, 2021, assets will be accounted for separately by plan and no roll forward will be necessary.

Method for Determining Actuarial Value of Assets

The asset valuation method is the smoothed market value method, using a smoothing period of five years. The actuarial value of assets will equal the market value of assets with gains subtracted or losses added (relative to the expected market value of assets) at the rates described below:

- a. 4/5 of the prior year's gain or loss
- b. 3/5 of the second preceding year's gain or loss
- c. 2/5 of the third preceding year's gain or loss
- d. 1/5 of the fourth preceding year's gain or loss

The gain or loss for a year is determined by calculating the difference between the expected value of assets for the year and the market value of assets at the valuation date. The expected value of assets for the year is the market value of assets at the prior-year valuation date brought forward with interest at the valuation interest rate to the current valuation date, plus contributions minus benefit disbursements and expenses, all adjusted with interest at the valuation rate to the current valuation date. If the expected value is greater than the market value, there is a loss.

The actuarial value of assets shall be limited to be between 50% and 150% of the market value of assets.

Investment Return

7.00%, compounded annually, net of investment expenses.

Section VI. Actuarial Methods and Assumptions

Administrative Expenses

Total administrative expenses for the fiscal year are assumed to be the average of the administrative expenses for the prior two years, rounded to the nearest \$10,000.

Salary Increases

Law Enforcement/Corrections

Years of Service	Increase
0 – 3	10.00%
4 – 9	8.25%
10 – 14	7.00%
15 – 19	6.50%
20+	4.50%

We assume that law enforcement/corrections pay increases occur in the middle of the fiscal year, because they occur on employment anniversary dates.

Fire/Rescue

Years of Service	Increase
0 – 3	9.00%
4 – 9	8.00%
10 – 14	6.50%
15+	4.50%

Cost of Living Increase in Benefits

1.0%, compounded annually. Additional ad hoc increases are not pre-funded (see the *Amortization of Unfunded Actuarial Accrued Liability* section above).

Inflation

2.5%, compounded annually.

Payroll Increase

2.5%, compounded annually.



Section VI. Actuarial Methods and Assumptions

Mortality

Pre-Retirement

70% of Pub-2010 Safety Employees Amount-Weighted Mortality table with fully generational projection using scale MP2018.

20% of active participant mortality is assumed to be service connected.

Post Retirement

Pub-2010 General Retirees Amount-Weighted Mortality table with fully generational projection using scale MP2018.

Disabled Post Retirement

Pub-2010 General Disabled Retirees Amount-Weighted Mortality table with fully generational projection using scale MP2018.

The projection to the year of the valuation is assumed to be current mortality experience. The generational projection beyond the year of the valuation is assumed to account for future mortality improvements.

Termination of Employment

Years of Service	Rate
0	9.00%
1	6.50%
2	5.00%
3	5.00%
4	5.00%
5 – 6	2.25%
7	2.25%
8	2.25%
9	1.75%
10 – 11	1.75%
12	1.75%
13 – 14	1.75%
15 – 19	1.00%
20+	0.50%

Non-Vested Terminations

We value non-vested terminations based on the amount of their employee contributions with interest, which is assumed to be paid on the valuation date.

Section VI. Actuarial Methods and Assumptions

Retirement Rates

Participants Hired Prior to July 1, 2011 (Not Immediately DROP Eligible on July 1, 2021)

Age	Service		
	15	20	21+
50	18%	40%	14%
55	8%	40%	8%
60	8%	40%	8%
65	15%	40%	15%
67	100%	100%	100%

Participants Hired Prior to July 1, 2011 (Immediately DROP Eligible on July 1, 2021)

40% of employees who are immediately eligible to enter DROP are assumed to do so. These same employees are assumed to retire over the next 2 years according to the table below:

Age	Service	
	20-27	28+
50	14%	14%
55	14%	8%
60	14%	8%
65	14%	15%
67	100%	100%

After the three years, the retirement rates are the same for other pre-2011 employees.

For participants hired prior to July 1, 2011, current and future terminated vested participants are assumed to commence benefits at age 50.

Participants Hired After June 30, 2011

Age	Service		
	20	25	26+
55	50%	65%	10%
60	10%	65%	10%
65	15%	65%	15%
67	100%	100%	100%

For participants hired after June 30, 2011, current and future terminated vested participants are assumed to commence benefits at age 55.

Section VI. Actuarial Methods and Assumptions

Disability Rates

Sample disability rates are as follows:

Age	Rate
25	0.0633%
35	0.1092%
45	0.2404%
55	0.7476%

70% of the disabilities are assumed to be Line of Duty. 40% of the Line of Duty disabilities are assumed to be Catastrophic.

Sick Leave

The service credit for unused sick leave is assumed to be 2.00% of Creditable Service from all other sources.

Beneficiary Demographics

100% assumed to have a beneficiary with female beneficiaries 3 years younger than the male participant and male beneficiaries 3 years older than the female participant.

Form of Payment

Future retired and disabled participants are assumed to elect a life annuity with mandatory return of employee contributions. Future terminated vested participants are assumed to elect the greater of the return of employee contributions and a deferred life annuity with mandatory return of employee contributions.

Guaranteed Return Period for Employee Contributions

Three years.

Pre-Employment Military Service

We assume that after earning 10 years of eligibility service each participant will receive credit of 0.6 years of pre-employment military service.

Earned Income Offset for Future Disabled Participants

We assume that no disabled participant will have an earned income offset.

Job Classification Transfers

We value participants who are job classification transfers (e.g. Uniformed to Non-Uniformed) as if they always worked in their current positions.

We value employees who transferred to a job classification that is no longer eligible for retirement benefits (e.g. Library employees) as separated vested participants.



Section VI. Actuarial Methods and Assumptions

Rationale for Assumptions

The key assumptions were based on the most recent Experience Study dated September 10, 2019. The discount rate is reviewed at least once annually.

Changes in Assumptions and Methods Since Prior Valuation

There were no changes to assumptions or methods since the prior valuation.

Section VII. Glossary

Actuarial Accrued Liability (AAL)

The difference between the Actuarial Present Value of Future Benefits and the Actuarial Present Value of Future Normal Costs or the portion of the present value of future benefits allocated to service before the valuation date in accordance with the actuarial cost method. Represents the present value of benefits expected to be paid from the plan in the future allocated to service prior to the date of the measurement.

Actuarial Asset Valuation Method

The method of determining the value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially determined contribution (ADC).

Actuarial Cost Method

A procedure for allocating the Actuarial Present Value of Future Benefits and the actuarial Present Value of Future Normal costs and the Actuarial Accrued Liability. Also known as the “funding method”. Examples of actuarial cost methods include Aggregate, Entry Age Normal, Projected Unit Credit, and Pay-as-you-go.

Actuarial Present Value of Future Benefits (APVFB)

The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.

Aggregate Cost Method

An actuarial cost method that spreads the cost of all future benefits in excess of plan assets as a level percentage of future salary or service. The actuarial accrued liability is set to the value of assets in this method.

Annual Determined Contributions of the Employer(s) (ADC)

The employer’s periodic determined contributions to a pension plan, calculated in accordance with the assumptions and methods used by the plan actuary. The ADC replaced the actuarially required contribution (ARC), with the replacement of GASB 27 with GASB 68.

Cost-of-Living Adjustment (COLA)

An annual increase in the amount of a retired participant’s benefit intended to adjust the benefit for inflation.

Covered Group

Plan members included in actuarial valuation.

Section VII. Glossary

Deferred Retirement Option Program (DROP)

A program allowing a participant eligible to retire to continue working for a fixed period of time, while accumulating the benefit payments he would have received if he had retired on his entry to DROP.

Demographic Assumption

Assumptions regarding the future population of pension participants, including retirement, termination, disability and mortality assumptions.

Economic Assumption

Assumptions regarding future economic factors, including COLA, salary improvement, change in average wages, changes in Social Security benefits and investment returns.

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 (EAN) Cost Method

An actuarial cost method that spreads the cost for each individual's expected benefits over their career, either as a level percentage of pay or service. The actuarial accrued liability is the accumulated value of all past normal cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.

Expenses

Plan expenses paid by the plan are divided into administrative and investment related expenses.

Funded Ratio

The assets expressed as a percentage of the plan's actuarial accrued liability.

GASB

Government Accounting Standards Board.

GASB No. 25 and GASB No. 27

These are the government accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems while Statement No. 25 sets the rules for the systems themselves.

Section VII. Glossary

GASB No. 67 and GASB No. 68

These are the government standards that replace GASB 25 and 27. They are effective for plan years beginning after June 14, 2013 and employer fiscal years beginning after June 14, 2014.

Investment Return Assumption or Investment Rate of Return (Discount Rate)

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

Level Percentage of Projected Payroll Amortization Method

Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years. The dollar amount of the payments generally will increase over time as payroll increases due to inflation; in dollars adjusted for inflation, the payments can be expected to remain level.

Normal Cost or Normal Actuarial Cost

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

Pay-as-you-go (PAYG)

A method of financing a benefits 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 or real wage growth; 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 a Pension or 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.

Post-Employment

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

Section VII. Glossary

Projected Unit Credit (PUC) Funding Method

An actuarial cost method that spreads the employee's benefit over their career, as a level percentage of service. The normal cost is the present value of the portion of the benefit assigned to the current year. The actuarial accrued liability is the accumulated value of all past normal cost, and the unfunded accrued liability (surplus) is the excess of the AAL over the value of assets.

Salary Improvement

An actuarial assumption regarding the increase in employees' salaries, reflecting cost-of-living, merit and longevity increases.

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 percent for year 2000, 7.5 percent for 2001, and 7 percent for 2002 and thereafter, then 8 percent and 7.5 percent are select rates, and 7 percent is the ultimate rate.

Unfunded Actuarial Accrued Liabilities

The excess of the present value of prospective pension benefits, as of the date of a pension plan valuation, over the sum of (1) the actuarial value of the assets of the plan and (2) the present value of future normal costs determined by any of several actuarial cost methods. For plans that define an accrued liability, this amount equals the excess of the accrued liability over plan assets.

Vested Plan Benefits

All benefits to which current participants have a vested right based on pay and service through the valuation date. A participant has a vested right to a benefit if he/she would still be eligible to receive that benefit if employment terminated on the valuation date.



Appendix 1

Summary of Funding Progress

Valuation Date	(1)	(2)	(3)	(4)	(5)	(6)
	Actuarial Value of Assets	Actuarial Accrued Liability	Percentage Funded (1) / (2)	Unfunded Actuarial Accrued Liability (2) - (1)	Annual Covered Payroll	Unfunded Actuarial Accrued Liability as a Percentage of Covered Payroll (4) / (5)
7/1/2012	312,691,229	382,729,492	81.70%	70,038,263	101,379,283	69.10%
7/1/2013	351,176,012	410,863,463	85.50%	59,687,451	100,298,314	59.50%
7/1/2014	409,207,584	471,296,347	86.80%	62,088,763	99,555,466	62.40%
7/1/2015	464,425,734	497,952,590	93.30%	33,526,856	100,998,017	33.20%
7/1/2016	507,387,475	535,381,083	94.80%	27,993,608	108,689,005	25.80%
7/1/2017	560,786,003	573,652,881	97.80%	12,866,878	114,631,335	11.20%
7/1/2018	618,216,079	618,091,606	100.00%	(124,473)	117,955,522	-0.10%
7/1/2019	672,178,511	660,653,672	101.70%	(11,524,839)	130,635,887	-8.80%
7/1/2020	723,825,038	709,960,247	102.00%	(13,864,791)	139,795,730	-9.90%
7/1/2021 ³	341,206,289	347,713,165	98.13%	6,506,876	59,739,878	10.89%

Analysis of the dollar amounts of net assets available for benefits, actuarial accrued liability, and unfunded actuarial accrued liability in isolation can be misleading. Expressing the net assets available for benefits as a percentage of the actuarial accrued liability provides one indication of funding status on a going-concern basis. Analysis of this percentage over time indicates whether the plan is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan. Trends in unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Expressing the unfunded actuarial accrued liability as a percentage of annual covered payroll approximately adjusts for the effects of inflation and aids analysis of Frederick County's progress made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan.

³ Note that all plan years prior to 7/1/2021 include both Uniformed and Non-Uniformed assets, liabilities and payroll since all participants were in one plan. Starting 7/1/2021, only Uniformed information is presented.



Appendix 2

Benefit Payment Projection

The following table shows the estimated benefit payments from July 1, 2021 through June 30, 2031 based on existing members of the plan.

Fiscal Year	Benefits
2022	13,486,000
2023	14,560,000
2024	15,900,000
2025	17,668,000
2026	19,340,000
2027	21,312,000
2028	23,425,000
2029	25,288,000
2030	26,717,000
2031	28,089,000

Appendix 3

ASOP 51 Disclosure

Actuarial Standard of Practice No. 51 *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions* is effective for actuarial valuations after November 2018. The standard requires actuaries to provide information so that users of the report can better understand the potential for future results to vary from the results presented in this report and identify risks on the plan's future financial condition. This standard does not require the assessment to be based on numerical calculations.

Examples of risk common to most public plans include the following (generally listed from greatest to least risk):

- Investment risk: The potential that investment returns will be different than expected. The Trustees are well aware of this risk.
- Contribution risk: Most commonly this is associated with the potential that actual future contributions are not made in accordance with the plan's actuarially based funding policy. When this occurs, it can create negative long-term problems.
- Longevity and other demographic risks: The potential that mortality or other demographic experience will be different than expected.
- Asset/liability mismatch risk: The potential that changes in asset values are not matched by changes in the value of liabilities.
- Cash flow risks: The potential that contributions coming into the plan will not cover benefit payments. While common in well-funded plans, this still requires the use of interest, dividends or principal to cover benefit payments. When assets need to be sold (or more cash held) it can be an issue. Poorly funded plans with DROP lump sum payments can be a particular issue.

One item left off this list is "interest rate risk" (i.e., the potential that interest rates will be different than expected). This risk is common in corporate ERISA plans where funding is based on bond rates. Interest rates on bonds are still an important consideration when setting an expected return assumption and can change over time.

There are some plan maturity measures that are significant to understanding the risks associated with the plan. The following table shows four commonly used measures of the relative riskiness of a pension plan, relative to the plan sponsor and the employee group covered by the plan.



Appendix 3

ASOP 51 Disclosure

Risk Measure	7/1/2019	7/1/2020	7/1/2021	Conservative Measures
Inactive Liability as a Percent of Total Liability	42%	41%	44%	<50%
Assets to Payroll	5.5	5.5	6.5	<5
Liabilities to Payroll	5.3	5.5	5.8	<5
Benefit Payments to Contributions	0.6	0.6	0.7	<3

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

The Asset Volatility Ratio (AVR) is equal to the market value of assets (MVA) divided by payroll. A higher AVR implies that the plan is exposed to greater contribution volatility. The current AVR of 6.5 indicates that a 1% asset gain/loss can be related to about 6.5% of the annual payroll. The plan currently amortizes asset gains/losses over a period of 15 years. This would result in a change in the County's contribution of about 0.6% of payroll for each 1.0% asset gain/loss.

The Liability Volatility Ratio (LVR) is equal to the Actuarial Accrued Liability (AAL) divided by payroll. A higher LVR implies that the plan is exposed to greater contribution volatility due to changes in liability measurements. The current LVR of 5.8 indicates that a 1% liability gain/loss can be related to about 5.8% of the annual payroll. The plan currently amortizes liability gains/losses over a period of 15 years. This would result in a change in the County's contribution of about 0.5% of payroll for each 1.0% AAL gain/loss. As the plan approaches a 100% funded level, the AVR will converge to the LVR.

The use of payroll in these risk measures is an easily available substitute for the employer's revenue and often reflects the employer's ability to afford the plan. Each of the measures are a measure of plan maturity. The plan is considered more mature as measures exceed the "conservative" range. Mature plans present more risk to the plan sponsors because changes to the liability or assets will result in larger changes in the unfunded liability as compared to the overall size of the employer as measured by payroll.

Appendix 3

ASOP 51 Disclosure

If the plan or employer were interested in doing more quantitative assessment of risks, the following are example of tests that could be performed:

Scenario Test—A process for assessing the impact of one possible event, or several simultaneously or sequentially occurring possible events, on a plan’s financial condition. A scenario test could show, for example, the effect of a layoff or reduction in workforce, or early retirement program.

Sensitivity Test—A process for assessing the impact of a change in an actuarial assumption on an actuarial measurement. A sensitivity analysis could demonstrate, for example, the impact of a decrease in the valuation discount rate or a change in future life expectancies.

Stochastic Modeling—A process for generating numerous potential outcomes by allowing for random variations in one or more inputs over time for the purpose of assessing the distribution of those outcomes. This type of analysis could show, for example, a range of potential future contribution levels and the likelihood of contributions increasing to a certain level.

Stress Test—A process for assessing the impact of adverse changes in one or relatively few factors affecting a plan’s financial condition. A stress test could show, for example, the impact of a single year or period of several years with significant investment losses.