

# Prince George's County Deputy Sheriff's Pension Plan

Actuarial Valuation as of July 1, 2018



# Table of Contents

---

## Section

## Page

### **Introduction**

#### **A. Actuarial Valuation Results**

Table 1 – Comparative Actuarial Valuation Results	<b>A-1</b>
Table 2 – Reconciliation of Market Value of Assets	<b>A-2</b>
Table 3 – Development of Actuarial Value of Assets	<b>A-4</b>
Table 4 – Historical Comparison of Results	<b>A-6</b>
Table 5 – Reconciliation of Total Annual Contribution Rate and Employee/County Contribution Rates	<b>A-8</b>
Table 6 – Reconciliation of Unfunded Actuarial Accrued Liability and Funded Ratio	<b>A-9</b> <b>A-11</b>
Table 7 – Actuarial Participant Data – Active Members	<b>A-13</b>
Table 8 – Actuarial Participant Data – Terminated Vested Members and Members in Pay Status	

Comments and Analysis	<b>A-15</b>
-----------------------	-------------

#### **B. Summary of Plan Provisions**

Brief Summary of Plan Provisions	<b>B-1</b>
----------------------------------	------------

#### **C. Actuarial Assumptions and Methods**

#### **D. Glossary of Terms**

June 14, 2019

Board of Trustees  
Prince George's County  
1400 McCormick Drive  
Largo, Maryland 20774

**Subject: Actuarial Valuation Report for the Year Beginning July 1, 2018**

Dear Trustees:

The results of the annual actuarial valuation of the Deputy Sheriff's Pension Plan (the "Plan") as of July 1, 2018, are presented in this report.

This report was prepared at the request of the Board and is intended for use by the County and the Board and those designated or approved by the Board. This report may be provided to parties other than the County only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The purposes of the actuarial valuation are to measure the Plan's funding progress, to determine the contribution rates for the fiscal year ending June 30, 2020, and to analyze plan experience during the prior year. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results associated with the benefits described in this report, for purposes other than those identified above, may be significantly different.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section C of this report. This report includes risk metrics beginning on page A-18 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

The computed County contribution rate shown on page A-1 is best viewed as the minimum contribution rate that complies with the Board's funding policy. Users of this report should be aware that contributions made at that rate do not guarantee benefit security. Until the plan is fully funded, we encourage the plan sponsor to contribute in excess of the computed contribution rate.

This actuarial valuation assumes the continuing ability of the plan sponsor to make the contributions necessary to fund this plan. A determination regarding whether or not the plan sponsor is actually able to do so is outside our scope of expertise and was not performed.

This actuarial valuation is based upon:

**Data relative to the members of the Plan** – Data for active members and persons receiving benefits from the Plan was provided by the Plan's staff. We have tested this data for reasonableness.

**Asset Values** – The asset amounts of the Plan were provided by the Plan's auditors and the Plan's staff. The results for the funding actuarial valuation use an actuarial value of assets.

**Actuarial Method** – The actuarial method utilized for the Plan is the Individual Entry Age Normal Actuarial Cost Method. The objective of this method is to amortize the cost of Plan benefits over the entire career of each member as a level percentage of compensation. Any Unfunded Actuarial Accrued Liability (UAAL) under this method is separately financed. All actuarial gains and losses under this method are reflected in the UAAL.

**Actuarial Assumptions** – The actuarial assumptions including the investment return assumption, mortality rates, retirement rates, termination rates, disability rates, and salary increase rates were updated based on the recommendations from the experience study for the period July 1, 2013 through July 1, 2017. It is our opinion that the actuarial assumptions used for the actuarial valuation are reasonable. Additional information about the actuarial assumptions is included in Section C of this report.

**Benefit Provisions** – There have been no changes in benefit provisions since the previous valuation.

The funding objective is to provide the benefits of the Plan when due, with employee and employer contributions which, over time, will remain level as a percent of payroll.

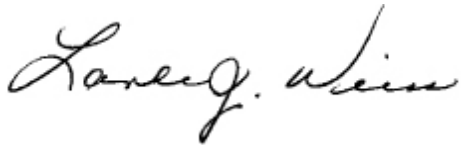
The findings in this report are based on data and other information through July 1, 2018. The actuarial valuation was based upon information furnished by Prince George's County staff, concerning Plan benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by Prince George's County staff.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the Plan as of the actuarial valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.



Lance J. Weiss and Amy Williams are Members of the American Academy of Actuaries (M.A.A.A.), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. The signing actuaries are independent of the plan sponsor.

Respectfully yours,



Lance J. Weiss, E.A., M.A.A.A., F.C.A.  
Senior Consultant and Team Leader



Amy Williams, A.S.A., M.A.A.A., F.C.A.  
Senior Consultant

AW:kb

## SECTION A.

---

### ACTUARIAL VALUATION RESULTS

# Table 1

## Comparative Actuarial Valuation Results <sup>1</sup>

### 30-Year Closed Period Level Percent of Pay Amortization <sup>4</sup>

	Results as of July 1, 2017			Results as of July 1, 2018		
	Comprehensive Plan	Supplemental Plan	Total	Comprehensive Plan	Supplemental Plan	Total
<b>A. Basic Data</b>						
1. Active Participants						
a. Number	244	3	247	254	2	256
b. Total Base Payroll	\$ 16,906,800	\$ 368,100	\$ 17,274,900	\$ 18,314,800	\$ 251,700	\$ 18,566,500
c. Average Annual Base Payroll	69,290	122,700	69,939	72,105	125,828	72,525
d. Average Attained Age	39.6	53.0	39.8	39.9	56.5	40.0
e. Average Years of Credited Service	9.3	26.8	9.5	9.6	27.5	9.7
2. Retired Participants and Beneficiaries <sup>2</sup>						
a. Number	141	62	203	145	64	209
b. Total Annual Pension Being Paid	\$ 7,178,600	\$ 817,000	\$ 7,995,600	\$ 7,313,700	\$ 872,900	\$ 8,186,600
3. Terminated Participants with Vested Benefits						
a. Number	10	1	11	12	1	13
b. Total Annual Vested Pension	\$ 221,100	\$ 9,400	\$ 230,500	\$ 255,500	\$ 9,400	\$ 264,900
<b>B. Valuation Results</b>						
1. Actuarial Accrued Liability						
a. Active Participants	\$ 49,117,500	\$ 1,112,500	\$ 50,230,000	\$ 64,290,900	\$ 761,800	\$ 65,052,700
b. Retired Participants and Beneficiaries <sup>2</sup>	79,878,400	8,249,400	88,127,800	82,179,700	8,990,800	91,170,500
c. Terminated Participants with Vested Benefits	1,905,000	35,800	1,940,800	2,163,000	43,200	2,206,200
d. Total	130,900,900	9,397,700	140,298,600	148,633,600	9,795,800	158,429,400
2. Actuarial Value of Assets	70,052,500	4,363,200	74,415,700	77,895,700	4,628,700	82,524,400
3. Unfunded Actuarial Accrued Liability (B.1.d. - B.2.)	60,848,400	5,034,500	65,882,900	70,737,900	5,167,100	75,905,000
4. Funded Ratio (B.2. / B.1.d.)	53.5%	46.4%	53.0%	52.4%	47.3%	52.1%
5. Annual Normal Cost <sup>3</sup>						
a. Retirement, Termination, and Death Benefits	\$ 4,793,000 (28.35%)	\$ 26,800 (7.28%)	\$ 4,819,800 (27.90%)	\$ 6,656,100 (36.34%)	\$ 25,800 (10.25%)	\$ 6,681,900 (35.99%)
b. Expenses of Administration	249,600 (1.48%)	34,200 (9.29%)	283,800 (1.64%)	232,700 (1.27%)	36,500 (14.50%)	269,200 (1.45%)
c. Total	5,042,600 (29.83%)	61,000 (16.57%)	5,103,600 (29.54%)	6,888,800 (37.61%)	62,300 (24.75%)	6,951,100 (37.44%)
6. Annual Contribution Requirement <sup>3,6</sup>						
a. Normal Cost	5,042,600 (29.83%)	61,000 (16.57%)	5,103,600 (29.54%)	6,888,800 (37.61%)	62,300 (24.75%)	6,951,100 (37.44%)
b. Amortization of Unfunded Liability Over a Closed 30 Years <sup>4</sup>	3,719,500 (22.00%)	884,200 (240.21%)	4,603,700 (26.65%)	4,309,100 (23.53%)	1,018,600 (404.69%)	5,327,700 (28.70%)
c. Adjustment Due to Anticipated Contributions in Upcoming Year <sup>5</sup>	(86,500) (-0.52%)	(76,300) (-20.73%)	(162,800) (-0.94%)	24,100 (0.13%)	(90,800) (-36.07%)	(66,700) (-0.37%)
d. Total	8,675,600 (51.31%)	868,900 (236.05%)	9,544,500 (55.25%)	11,222,000 (61.27%)	990,100 (393.37%)	12,212,100 (65.77%)
7. Annual Contribution Requirement <sup>3,6</sup>						
a. County Portion	6,891,600 (40.76%)	849,800 (230.85%)	7,741,400 (44.81%)	9,285,400 (50.70%)	977,000 (388.17%)	10,262,400 (55.27%)
b. Employee Portion	1,784,000 (10.55%)	19,100 (5.20%)	1,803,100 (10.44%)	1,936,600 (10.57%)	13,100 (5.20%)	1,949,700 (10.50%)
c. Total	8,675,600 (51.31%)	868,900 (236.05%)	9,544,500 (55.25%)	11,222,000 (61.27%)	990,100 (393.37%)	12,212,100 (65.77%)

<sup>1</sup> Most amounts rounded to nearest \$100.

<sup>2</sup> Includes disability retirees.

<sup>3</sup> Figures in parentheses show contribution as a percentage of total base payroll.

<sup>4</sup> Unfunded liability is amortized on a level percentage of payroll basis over a 30-year closed period beginning July 1, 2014, for Comprehensive, and on a level dollar basis over a 13-year closed period beginning July 1, 2011, for Supplemental. 26 years and 6 years are remaining in the amortization period as of July 1, 2018, for Comprehensive and Supplemental, respectively.

<sup>5</sup> Adjustment made to contribution rate to account for the one year lag between the actuarial valuation date at which the contribution rate is determined and the beginning of the fiscal year in which the contribution rate applies. Adjustment first effective with the actuarial valuation as of July 1, 2014, and the change to a closed period amortization policy.

<sup>6</sup> The Annual Contribution Requirement from the actuarial valuation as of July 1, 2017, applies to FY2019 and the Annual Contribution Requirement from the actuarial valuation as of July 1, 2018, applies to FY2020.

## Table 2A – Comprehensive Plan Reconciliation of Market Value of Assets

	As of June 30	
	2017	2018
Additions:		
Contributions:		
Employer	\$ 6,841,157	\$ 8,042,355
Employee	1,696,697	1,953,989
Total contributions	8,537,854	9,996,344
Transfers (to)/from other funds	279,252	-
Investment income :		
Net appreciation (depreciation) in fair value of assets	4,326,654	8,171,150
Interest and dividends	566,467	1,137,586
Total investment income	4,893,121	9,308,736
Less investment expense	265,530	256,265
Net investment income	4,627,591	9,052,471
Total additions	13,444,697	19,048,815
Deductions:		
Benefits	7,045,429	7,187,220
Refunds of contributions	138,885	96,694
General and administrative expenses	211,728	172,591
Transfers to/(from) other funds	-	-
Total deductions	7,396,042	7,456,505
Net increase (decrease)	6,048,655	11,592,310
Net assets held in trust for pension benefits, beginning of year	60,921,761	66,970,416
Net assets held in trust for pension benefits, end of year	\$ 66,970,416	\$ 78,562,726



## Table 2B – Supplemental Plan Reconciliation of Market Value of Assets

	As of June 30	
	2017	2018
Additions:		
Contributions:		
Employer	\$ 809,300	\$ 819,100
Employee	23,845	16,571
Total contributions	833,145	835,671
Transfers (to)/from other funds	-	-
Investment income:		
Net appreciation (depreciation) in fair value of assets	266,167	499,185
Interest and dividends	34,897	68,371
Total investment income	301,064	567,556
Less investment expense	4,500	8,475
Net investment income	296,564	559,081
Total additions	1,129,709	1,394,752
Deductions:		
Benefits	735,685	794,211
Refunds of contributions	48,281	60,573
General and administrative expenses	34,008	38,378
Transfers to/(from) other funds	-	-
Total deductions	817,974	893,162
Net increase (decrease)	311,735	501,590
Net assets held in trust for pension benefits, beginning of year	3,864,384	4,176,119
Net assets held in trust for pension benefits, end of year	\$ 4,176,119	\$ 4,677,709

## Table 3A – Comprehensive Plan Development of Actuarial Value of Assets

Year Ending June 30	2017	2018	2019	2020	2021	2022
Beginning of Year:						
(1) Market Value of Assets	\$60,921,761	\$ 66,970,416				
(2) Actuarial Value of Assets (Excluding Asset Transfer)	64,211,567	70,052,473				
(2a) Actuarial Value of Assets (Including Asset Transfer)	64,339,451	70,052,473				
End of Year:						
(3) Market Value of Assets	66,970,416	78,562,726				
(4) Net of Contributions and Disbursements	1,421,064	2,539,839				
(5) Total Investment Income						
= (3) - (1) - (4)	4,627,591	9,052,471				
(6) Projected Rate of Return	7.50%	7.50%				
(7) Projected Investment Income						
= (1) x (6) + [(1 + (6)) <sup>0.5-1</sup> ] x (4)	4,621,459	5,116,303				
(8) Investment Income in Excess of Projected Income						
= (5) - (7)	6,132	3,936,168				
(9) Excess Investment Income Recognized						
This Year (5-year recognition)						
(9a) From This Year	1,226	787,234				
(9b) From One Year Ago	(998,924)	1,226	\$ 787,234			
(9c) From Two Years Ago	(487,724)	(998,924)	1,226	\$ 787,234		
(9d) From Three Years Ago	885,261	(487,724)	(998,924)	1,226	\$ 787,234	
(9e) From Four Years Ago	398,544	885,259	(487,725)	(998,925)	1,228	\$ 787,232
(9f) Total Recognized Investment Gain/(Loss)	(201,617)	187,071	(698,189)	(210,465)	788,462	787,232
(10) Change in Actuarial Value of Assets						
= (4) + (7) + (9f)	5,840,906	7,843,213				
End of Year:						
<b>(3) Market Value of Assets</b>	<b>66,970,416</b>	<b>78,562,726</b>				
(11) Preliminary Actuarial Value of Assets = (2) + (10)	70,052,473	77,895,686				
(11a) Upper Corridor Limit 120% x (3)	80,364,499	94,275,271				
(11b) Lower Corridor Limit 80% x (3)	53,576,333	62,850,181				
(12) Adjustment to Remain within 20% Corridor	0	0				
<b>(13) Actuarial Value of Assets = (11) + (12)</b>	<b>70,052,473</b>	<b>77,895,686</b>				
(14) Pending Asset Transfer	0	0				
<b>(15) Final Actuarial Value of Assets = (13) + (14)</b>	<b>70,052,473</b>	<b>77,895,686</b>				

**Table 3B – Supplemental Plan  
Development of Actuarial Value of Results**

Year Ending June 30	2017	2018	2019	2020	2021	2022
Beginning of Year:						
(1) Market Value of Assets	\$ 3,864,384	\$ 4,176,119				
(2) Actuarial Value of Assets (Excluding Asset Transfer)	4,065,949	4,363,221				
(2a) Actuarial Value of Assets (Including Asset Transfer)	4,065,949	4,363,221				
End of Year:						
(3) Market Value of Assets	4,176,119	4,677,709				
(4) Net of Contributions and Disbursements	15,171	(57,491)				
(5) Total Investment Income						
= (3) - (1) - (4)	296,564	559,081				
(6) Projected Rate of Return	7.50%	7.50%				
(7) Projected Investment Income						
= (1) x (6) + [(1 + (6))^5 - 1] x (4)	290,387	311,092				
(8) Investment Income in Excess of Projected Income						
= (5) - (7)	6,177	247,989				
(9) Excess Investment Income Recognized						
This Year (5-year recognition)						
(9a) From This Year	1,235	49,598				
(9b) From One Year Ago	(61,628)	1,235	\$ 49,598			
(9c) From Two Years Ago	(29,818)	(61,628)	1,235	\$ 49,598		
(9d) From Three Years Ago	52,480	(29,818)	(61,628)	1,235	\$ 49,598	
(9e) From Four Years Ago	29,445	52,479	(29,820)	(61,629)	1,237	\$ 49,597
(9f) Total Recognized Investment Gain/(Loss)	(8,286)	11,866	(40,615)	(10,796)	50,835	49,597
(10) Change in Actuarial Value of Assets						
= (4) + (7) + (9f)	297,272	265,467				
End of Year:						
<b>(3) Market Value of Assets</b>	<b>4,176,119</b>	<b>4,677,709</b>				
(11) Preliminary Actuarial Value of Assets = (2) + (10)	4,363,221	4,628,688				
(11a) Upper Corridor Limit 120% x (3)	5,011,343	5,613,251				
(11b) Lower Corridor Limit 80% x (3)	3,340,895	3,742,167				
(12) Adjustment to Remain within 20% Corridor	0	0				
<b>(13) Actuarial Value of Assets = (11) + (12)</b>	<b>4,363,221</b>	<b>4,628,688</b>				
(14) Pending Asset Transfer	0	0				
<b>(15) Final Actuarial Value of Assets = (13) + (14)</b>	<b>4,363,221</b>	<b>4,628,688</b>				

## Table 4A – Comprehensive Plan Historical Comparison of Results

Year Ending June 30	2014	2015	2016	2017	2018
(1) Market Value of Assets	\$ 57,136,094	\$ 60,469,771	\$ 61,049,645	\$ 66,970,416	\$ 78,562,726
(2) Actuarial Value of Assets	\$ 52,513,150	\$ 59,588,837	\$ 64,339,451	\$ 70,052,473	\$ 77,895,686
(3) Difference Between Market & Actuarial Values	\$ 4,622,944	\$ 880,934	\$ (3,289,806)	\$ (3,082,057)	\$ 667,040
(4) Estimated Market Value Rate of Return	16.56 %	3.28 %	(0.71)%	7.51 %	13.27 %
(5) Estimated Actuarial Value Rate of Return	12.08 %	10.60 %	6.23 %	6.81 %	7.44 %
(6) Ratio of Actuarial Value to Market Value	92 %	99 %	105 %	105 %	99 %
(7) Funded Ratio (Market Value of Assets)	49.9 %	50.4 %	48.4 %	51.2 %	52.9 %
(8) Funded Ratio (Actuarial Value of Assets)	45.8 %	49.7 %	51.1 %	53.5 %	52.4 %

*Market value of assets and actuarial value of assets as of June 30, 2015, and June 30, 2016, include an adjustment for the pending asset transfer.*

## Table 4B – Supplemental Plan Historical Comparison of Results

Year Ending June 30	2014	2015	2016	2017	2018
(1) Market Value of Assets	\$ 3,749,188	\$ 3,867,575	\$ 3,864,384	\$ 4,176,119	\$ 4,677,709
(2) Actuarial Value of Assets	\$ 3,438,540	\$ 3,813,765	\$ 4,065,949	\$ 4,363,221	\$ 4,628,688
(3) Difference Between Market & Actuarial Values	\$ 310,648	\$ 53,810	\$ (201,565)	\$ (187,102)	\$ 49,021
(4) Estimated Market Value Rate of Return	15.55 %	3.52 %	(0.45)%	7.66 %	13.48 %
(5) Estimated Actuarial Value Rate of Return	13.30 %	11.32 %	6.22 %	6.93 %	7.45 %
(6) Ratio of Actuarial Value to Market Value	92 %	99 %	105 %	104 %	99 %
(7) Funded Ratio (Market Value of Assets)	38.5 %	40.7 %	41.2 %	44.4 %	47.8 %
(8) Funded Ratio (Actuarial Value of Assets)	35.3 %	40.1 %	43.3 %	46.4 %	47.3 %

**Table 5A – Comprehensive Plan  
Reconciliation of Total Annual Contribution Requirement and  
Employee/County Contribution Rates**

Valuation as of July 1	2014	2015	2016	2017	2018
Total contribution rate at previous valuation	55.30%	55.17%	53.04%	53.77%	51.31%
Expected total contribution rate at current valuation	54.04%	54.56%	53.14%	51.92%	50.14%
Change due to:					
Recognition of asset (gains)/losses	-0.87%	-0.75%	0.38%	0.11%	0.01%
Salary increases	-0.15%	-0.09%	0.32%	-0.16%	0.24%
Other plan experience	0.07%	-0.71%	-0.01%	-0.56%	-0.55%
Net transfers	0.00%	0.03%	-0.06%	0.00%	0.00%
Change in actuarial assumptions	2.08%	0.00%	0.00%	0.00%	11.43%
Plan improvements	0.00%	0.00%	0.00%	0.00%	0.00%
Measurement improvements	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>0.00%</u>
Total change	1.13%	-1.52%	0.63%	-0.61%	11.13%
Actual total contribution rate at current valuation	55.17%	53.04%	53.77%	51.31%	61.27%
<b>EMPLOYEE/COUNTY CONTRIBUTION RATES</b>					
Valuation as of July 1	2014	2015	2016	2017	2018
<u>Employee Contribution Rates</u>					
Hired before 7/1/2005	10.00%	10.00%	10.00%	10.00%	10.00%
Hired on or after 7/1/2005	11.00%	11.00%	11.00%	11.00%	11.00%
Composite	10.46%	10.50%	10.51%	10.55%	10.57%
<u>County Contribution Rates</u>					
Hired before 7/1/2005	45.17%	43.04%	43.77%	41.31%	51.27%
Hired on or after 7/1/2005	44.17%	42.04%	42.77%	40.31%	50.27%
Composite	44.71%	42.54%	43.26%	40.76%	50.70%

## Table 6A – Comprehensive Plan Reconciliation of Unfunded Actuarial Accrued Liability and Funded Ratio

Valuation as of July 1	2014	2015	2016	2017	2018
Unfunded liability at previous valuation	\$ 56,532,400	\$ 62,073,600	\$ 60,344,800	\$ 61,456,000	\$ 60,848,400
Expected unfunded liability at current valuation					
Normal cost for plan year	4,096,100	4,317,800	4,589,200	4,634,100	5,042,600
Interest on unfunded liability and normal cost	4,390,900	4,814,500	4,694,800	4,779,900	4,749,400
Contributions with interest to current valuation date	<u>7,526,400</u>	<u>8,477,200</u>	<u>8,668,400</u>	<u>8,852,200</u>	<u>10,364,400</u>
Total expected change in unfunded liability at current valuation	960,600	655,100	615,600	561,800	(572,400)
Total expected unfunded liability at current valuation	57,493,000	62,728,700	60,960,400	62,017,800	60,276,000
Change due to:					
Recognition of asset (gains)/losses	(2,060,100)	(1,873,800)	920,500	296,300	44,100
Salary increases	1,203,400	1,014,500	(274,100)	(432,300)	1,654,600
Other plan experience	747,600	(1,613,400)	(12,500)	(1,033,400)	(1,024,700)
Net transfers	0	88,800	(138,300)	0	0
Change in actuarial assumptions	4,689,700	0	0	0	9,787,900
Plan improvements	0	0	0	0	0
Measurement improvements	0	0	0	0	0
Total change	4,580,600	(2,383,900)	495,600	(1,169,400)	10,461,900
Unfunded liability at current valuation	62,073,600	60,344,800	61,456,000	60,848,400	70,737,900
<b>RECONCILIATION OF FUNDED RATIO (BASED ON ACTUARIAL VALUE OF ASSETS)</b>					
Valuation as of July 1	2014	2015	2016	2017	2018
Funded ratio at previous valuation	45.2%	45.8%	49.7%	51.1%	53.5%
Expected funded ratio at current valuation	46.7%	47.9%	51.7%	53.1%	56.4%
Change due to:					
Recognition of asset gains/(losses)	1.8%	1.6%	-0.8%	-0.2%	0.0%
Salary increases	-0.5%	-0.4%	0.1%	0.1%	-0.7%
Other plan experience	-0.3%	0.6%	0.0%	0.5%	0.4%
Net transfers	0.0%	0.0%	0.1%	0.0%	0.0%
Change in actuarial assumptions	-1.9%	0.0%	0.0%	0.0%	-3.7%
Plan improvements	0.0%	0.0%	0.0%	0.0%	0.0%
Measurement improvements	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>
Total change	-0.9%	1.8%	-0.6%	0.4%	-4.0%
Funded ratio at current valuation	45.8%	49.7%	51.1%	53.5%	52.4%
Market value of assets funded ratio at current valuation	49.9%	50.4%	48.5%	51.2%	52.9%

## Table 6B – Supplemental Plan Reconciliation of Unfunded Actuarial Accrued Liability and Funded Ratio

Valuation as of July 1	2014	2015	2016	2017	2018
Unfunded liability at previous valuation	\$ 6,083,300	\$ 6,308,400	\$ 5,690,100	\$ 5,317,900	\$ 5,034,500
<u>Expected unfunded liability at current valuation</u>					
Normal cost for plan year	69,800	66,400	69,600	63,800	61,000
Interest on unfunded liability and normal cost	458,800	475,600	429,300	401,200	379,800
Contributions with interest to current valuation date	<u>826,900</u>	<u>877,200</u>	<u>904,900</u>	<u>863,800</u>	<u>866,400</u>
Total expected change in unfunded liability at current valuation	(298,300)	(335,200)	(406,000)	(398,800)	(425,600)
Total expected unfunded liability at current valuation	5,785,000	5,973,200	5,284,100	4,919,100	4,608,900
Change due to:					
Recognition of asset (gains)/losses	(176,800)	(146,000)	48,800	23,300	2,100
Salary increases	94,600	3,200	(12,300)	36,900	37,000
Other plan experience	(8,200)	(140,300)	(2,700)	55,200	486,200
Net transfers	0	0	0	0	0
Change in actuarial assumptions	613,800	0	0	0	32,900
Plan improvements	0	0	0	0	0
Measurement improvements	0	0	0	0	0
Total change	523,400	(283,100)	33,800	115,400	558,200
Unfunded liability at current valuation	6,308,400	5,690,100	5,317,900	5,034,500	5,167,100
<b>RECONCILIATION OF FUNDED RATIO (BASED ON ACTUARIAL VALUE OF ASSETS)</b>					
Valuation as of July 1	2014	2015	2016	2017	2018
Funded ratio at previous valuation	33.5%	35.3%	40.1%	43.3%	46.4%
Expected funded ratio at current valuation	36.1%	38.0%	43.8%	47.1%	50.1%
Change due to:					
Recognition of asset gains/(losses)	1.8%	1.5%	-0.5%	-0.3%	0.0%
Salary increases	-0.4%	0.0%	0.0%	-0.2%	-0.2%
Other plan experience	0.0%	0.6%	0.0%	-0.2%	-2.5%
Net transfers	0.0%	0.0%	0.0%	0.0%	0.0%
Change in actuarial assumptions	-2.2%	0.0%	0.0%	0.0%	-0.1%
Plan improvements	0.0%	0.0%	0.0%	0.0%	0.0%
Measurement improvements	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>
Total change	-0.8%	2.1%	-0.5%	-0.7%	-2.8%
Funded ratio at current valuation	35.3%	40.1%	43.3%	46.4%	47.3%
Market value of assets funded ratio at current valuation	38.5%	40.7%	41.2%	44.4%	47.8%



**Table 7A – Comprehensive Plan  
Actuarial Participant Data – Active Members**

Attained Age	Completed Years of Service at Valuation Date							Total	Valuation Payroll
	0-4	5-9	10-14	15-19	20-24	25-29	30&Up		
Under 20									\$ -
20-24	13							13	627,774
25-29	31	7						38	1,933,766
30-34	19	16	9					44	2,652,170
35-39	4	2	25	7				38	2,816,970
40-44	2	2	16	13	4			37	3,102,601
45-49	1	3	18	6	4			32	2,605,233
50-54	5	7	9	10		2		33	2,930,246
55-59	2	4	4	4		1		15	1,236,762
60+		1		2		1		4	409,274
<b>Total</b>	<b>77</b>	<b>42</b>	<b>81</b>	<b>42</b>	<b>8</b>	<b>4</b>		<b>254</b>	<b>\$ 18,314,796</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 39.9 years  
Service: 9.6 years  
Annual Pay: \$72,105

**Table 7B – Supplemental Plan  
Actuarial Participant Data – Active Members**

Attained Age	Completed Years of Service at Valuation Date							Total	Valuation Payroll
	0-4	5-9	10-14	15-19	20-24	25-29	30&Up		
30-34									\$ -
35-39									-
40-44									-
45-49									-
50-54						1		1	102,083
55-59									-
60+						1		1	149,572
<b>Total</b>						<b>2</b>		<b>2</b>	<b>\$ 251,655</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 56.5 years  
Service: 27.5 years  
Annual Pay: \$125,828

## Table 8A – Comprehensive Plan

### Actuarial Participant Data – Terminated Vested Members and Members in Pay Status

---

Retired Participants, Disability Retirees and Beneficiaries*			Terminated Vested Participants		
Age Group	Number	Annual Pension Being Paid	Age Group	Number	Annual Deferred Pension
Under 55	40	\$ 1,794,200	Under 25	-	\$ -
55-59	16	895,441	25-34	2	26,158
60-64	31	1,819,424	35-44	9	191,239
65-69	36	1,965,324	45-54	1	38,069
70 & Over	22	839,308	55 & Over	-	-
<b>Total</b>	<b>145</b>	<b>\$ 7,313,697</b>	<b>Total</b>	<b>12</b>	<b>\$ 255,466</b>

*\*Number and benefits paid to alternate payees are classified based on the retiree's age.*

## Table 8B – Supplemental Plan

### Actuarial Participant Data – Terminated Vested Members and Members in Pay Status

---

Retired Participants and Beneficiaries*			Terminated Vested Participants		
Age Group	Number	Annual Pension Being Paid	Age Group	Number	Annual Deferred Pension
Under 55	5	\$ 67,915	Under 25	-	\$ -
55-59	12	199,917	25-34	-	-
60-64	10	122,038	35-44	-	-
65-69	17	272,903	45-54	1	9,379
70 & Over	20	210,143	55 & Over	-	-
<b>Total</b>	<b>64</b>	<b>\$ 872,916</b>	<b>Total</b>	<b>1</b>	<b>\$ 9,379</b>

*\*Number and benefits paid to alternate payees are classified based on the retiree's age.*

## Comments and Analysis

---

### A. PURPOSES OF THE ACTUARIAL VALUATION

This report presents the results of an actuarial valuation of the Plan as of July 1, 2018. The purposes of the actuarial valuation are to determine the funding status of the Plan as of the valuation date, to develop contribution rates for fiscal year 2020, and to analyze the experience of the Plan during the past year. The required accounting information for pension plans, under GASB Statement No. 67, is provided in a separate report beginning for fiscal year ending June 30, 2014. The required accounting information for pension plan sponsors, under GASB Statement No. 68, is provided in a separate report beginning for fiscal year ending June 30, 2015. Historical accounting information can be found in the funding actuarial valuation report as of July 1, 2014.

### B. EXPERIENCE DURING FY 2018

#### Comprehensive Plan

In summary, the results of the actuarial valuation indicate a total contribution rate for the fiscal year beginning July 1, 2019, of 61.27 percent of covered payroll, representing payment of the normal cost and amortization of the unfunded actuarial accrued liability over a 30-year closed level-percent-of-pay amortization period ( 26 years remaining as of July 1, 2018). Based on the current actuarial valuation, the average employee contribution is 10.57 percent of pay, with the County contributing the remaining 50.70 percent of pay. The total contribution rate increased from 51.31 percent of pay at the last actuarial valuation to 61.27 percent of pay.

As of July 1, 2018, the actuarial accrued liability of \$148,633,600 is 52.4 percent funded by the actuarial value of assets of \$77,895,700, leaving an unfunded actuarial accrued liability of \$70,737,900. The funded ratio decreased from 53.5 percent at the last actuarial valuation to 52.4 percent for the current actuarial valuation.

The estimated asset return during the year ended June 30, 2018, was 13.27 percent on a market value of assets basis and 7.44 percent on an actuarial value of assets basis. The estimated asset return on a market value basis was higher and on an actuarial value of assets basis was slightly lower than the assumed asset return of 7.50 percent during fiscal year 2018. The asset gains in fiscal years 2014, 2017 and 2018, offset by the asset losses in fiscal years 2015 and 2016, resulted in a slight net increase in the contribution rate and no change in the funded ratio attributable to investment performance. Table 4A has information on historical investment returns and asset values.

There was unfavorable salary increase experience and favorable demographic plan experience (retirements, disabilities, terminations and deaths) compared to what was expected under the actuarial assumptions.

The change in actuarial assumptions decreased the funded ratio and increased the contribution rate.

Tables 5A and 6A have reconciliations of the contribution rates, unfunded actuarial accrued liability and funded ratio, including changes due to asset returns, plan experience, changes in actuarial assumptions and changes in plan provisions.

## Comments and Analysis

---

### **Supplemental Plan**

At the Board of Trustees Meeting on November 16, 2011, the Trustees for the Deputy Sheriff's Supplemental Pension Plan voted to adopt a new funding policy for the Deputy Sheriff's Supplemental Pension Plan. Under the new policy, the funding of the Supplemental Plan is accelerated using a 13-year closed-period, level dollar amortization of the unfunded liability. The results found in this report as of July 1, 2018, which determine the fiscal year 2020 contributions, reflect this funding policy.

In summary, the results of the Supplemental Plan valuation indicate a total County contribution for the fiscal year beginning July 1, 2019, of \$977,000, representing payment of the normal cost and amortization of the unfunded actuarial accrued liability over a 13-year closed period as a level dollar amount (6 years remaining as of the valuation date). Employee contributions continue to be 5.20 percent of pay.

As of July 1, 2018, the actuarial accrued liability of \$9,795,800 is 47.3 percent funded by the actuarial value of assets of \$4,628,700, leaving an unfunded actuarial accrued liability of \$5,167,100. The funded ratio increased from 46.4 percent at the last valuation to 47.3 percent for the current valuation.

The estimated asset return during the year ended June 30, 2018, was 13.48 percent on a market value of assets basis and 7.45 percent on an actuarial value of assets basis. The estimated asset return on a market value basis was higher and on an actuarial value of assets basis was slightly lower than the assumed asset return of 7.50 percent during fiscal year 2018. The asset gains in fiscal years 2014, 2017 and 2018, offset by the asset losses in fiscal years 2015 and 2016 resulted in no change in the funded ratio attributable to investment performance. Table 4B has information on historical investment returns and asset values.

There was unfavorable salary increase experience and unfavorable demographic plan experience (retirements, terminations and deaths) compared to what was expected under the actuarial assumptions.

The change in actuarial assumptions decreased the funded ratio and increased the contribution rate.

Table 6B has reconciliations of the unfunded actuarial accrued liability and funded ratio, including changes due to asset returns, plan experience, changes in actuarial assumptions and changes in plan provisions.

### **C. PLAN PROVISIONS**

There have been no changes in benefit provisions since the previous actuarial valuation. The plan provisions are summarized in Section B.

### **D. ACTUARIAL ASSUMPTIONS AND METHODS**

Section C contains a summary of the actuarial assumptions and methods used in the actuarial valuation. The Board adopted changes in the actuarial assumptions first effective with this actuarial valuation as of July 1, 2018, based on an experience study performed for the period July 1, 2013 to July 1, 2017.

The funding method for the Comprehensive Plan is based on the Individual Entry Age Normal Actuarial Cost Method and 30-year closed-period level-percent-of-pay amortization of the unfunded liability beginning with the valuation as of July 1, 2014. (30-year open-period level-percent-of-pay amortization was used prior to the valuation as of July 1, 2014.) Funding under the 30-year closed-period policy is expected to gradually improve the funded status over time and increase the funded ratio to 100 percent at the end of the 30-year period.

The funding method for the Supplemental Plan is based on the Individual Entry Age Normal Actuarial Cost Method and 13-year closed-period level-dollar amortization of the unfunded liability beginning with the actuarial valuation as of July 1, 2011. Funding under the 13-year closed-period policy is expected to increase the funded ratio to 100 percent at the end of the 13-year period.

### **E. ACCOUNTING INFORMATION UNDER GASB**

A separate actuarial valuation report with calculations completed in accordance with the provisions of GASB Statement Nos. 67 and 68 has been issued.

### **F. OTHER OBSERVATIONS**

#### **General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status**

Given the Plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the Plan earning 7.25 percent on the actuarial value of assets), it is expected that:

- 1) For the Comprehensive Plan, the County normal cost as a percentage of pay will decrease to the level of the normal cost for members hired after July 1, 2008 (with later retirement eligibility conditions and higher employee contribution rates) as time passes and the majority of the active population is comprised of these members. The unfunded liability contribution will remain level as a percentage of pay through the end of the closed amortization period. For the Supplemental Plan, the County normal cost will remain level as a percentage of pay, but will decrease as a dollar amount as the number of active members decreases. The unfunded liability contribution will remain level as a dollar amount through the end of the closed amortization period;
- 2) For the Comprehensive Plan, the unfunded actuarial accrued liabilities will be fully amortized after 30 years from the fiscal year ending June 30, 2016 (June 30, 2045), which corresponds to the beginning of the closed amortization period established in the actuarial valuation as of July 1, 2014. For the Supplemental Plan, the unfunded actuarial accrued

## Comments and Analysis

---

liabilities will be fully amortized after 13 years from the fiscal year ending June 30, 2013 (June 30, 2025), which corresponds to the beginning of the closed amortization period established in the actuarial valuation as of July 1, 2011; and

- 3) The funded status of the plans will increase gradually towards a 100 percent funded ratio.

### **Limitations of Funded Status Measurements**

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

- 1) The measurement is inappropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations; for example, transferring the liability to an unrelated third party in a free market type transaction.
- 2) The measurement is dependent upon the actuarial cost method which, in combination with the Plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100 percent is not synonymous with no required future contributions. If the funded status were 100 percent, the Plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).
- 3) The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets.

## **G. RISK MEASURES**

### **Risks Associated With Measuring the Accrued Liability and Actuarially Determined Contribution**

The determination of the accrued liability and the actuarially determined contribution requires the use of actuarial assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the actuarial assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

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 due to changing conditions; 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 scope of this actuarial valuation does not include an analysis of the potential range of such future measurements.



## Comments and Analysis

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

- 1) Investment risk – actual investment returns may differ from the expected returns;
- 2) Asset/Liability mismatch – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
- 3) Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll or other relevant contribution base;
- 4) Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
- 5) Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
- 6) Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The County contribution rates shown in Table 1 and Table 5 may be considered as a minimum contribution rate that complies with the County's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

### Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

<u>Comprehensive Plan</u>		
	<u>2017</u>	<u>2018</u>
Ratio of the market value of assets to total payroll	3.96	4.29
Ratio of actuarial accrued liability to payroll	7.74	8.12
Ratio of actives to retirees and beneficiaries	1.73	1.75
Ratio of net cash flow to market value of assets	2%	3%

## Comments and Analysis

### Supplemental Plan

	<u>2017</u>	<u>2018</u>
Ratio of the market value of assets to total payroll	11.35	18.58
Ratio of actuarial accrued liability to payroll	25.53	38.92
Ratio of actives to retirees and beneficiaries	0.05	0.03
Ratio of net cash flow to market value of assets	0%	-1%

#### **Ratio of Market Value of Assets to Payroll**

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5 percent different than assumed would equal 10 percent of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

#### **Ratio of Actuarial Accrued Liability to Payroll**

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100 percent is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability itself. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2 percent other than assumed would equal 5 percent of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

#### **Ratio of Actives to Retirees and Beneficiaries**

A young plan with many active members and few retirees will have a high ratio of active to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

#### **Ratio of Net Cash Flow to Market Value of Assets**

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

#### **Additional Risk Assessment**

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

## **SECTION B.**

---

### **SUMMARY OF PLAN PROVISIONS**

# Brief Summary of Plan Provisions

	<u>Comprehensive Plan</u>	<u>Supplemental Plan</u>
1. Effective Date:	July 1, 1996, as amended through July 1, 2018.	June 30, 1985, as amended through July 1, 2018.
2. Eligibility:	All full-time members of the Deputy Sheriff's Association hired on or after July 1, 1996, and those hired prior to July 1, 1996, who elected to participate in the Comprehensive Plan. Effective July 1, 1999, employees participating in the Supplemental Plan were given a one-time opportunity to elect to transfer to the Comprehensive Plan.	All full-time members of the Deputy Sheriff's Association hired before July 1, 1996, except those who elected to participate in the Comprehensive Plan.
3. Credited Service:	All continuous service (up to a maximum of 30 years) during which contributions are made, and interruptions of continuous service due to disability, or to military service.	All continuous service (up to a maximum of 30 years) during which contributions are made, and interruptions of continuous service due to disability, or to military service.
4. Retirement Dates:		
a. Normal –	The earlier of completion of 20 years of County service, or age 55 with at least 5 years of County service. For non-vested members as of July 1, 2013 (hired after July 1, 2008), the earlier of completion of 25 years of County service, or age 55.	The earliest of completion of 25 years of County service, age 55 with at least 15 years of County service, or age 62 with 5 years of County service.
b. Early –	No provision.	No provision.
c. Late –	An employee may work beyond Normal Retirement Date.	An employee may work beyond Normal Retirement Date.
d. Disability –	<u>Service-Connected</u> – No minimum service requirement.  <u>Non-Service-Connected</u> – 5 years of credited service.	Entitled to disability benefits under the Maryland State plan (generally the same rules as under the Comprehensive Plan).
5. Annual Retirement Benefits:		
a. Normal or Late –	3.0% of Average Annual Compensation (high 24 months' base) times years of service (not to exceed 20) plus 2.5% times years of service in excess of 20 (not to exceed 10) plus 2.5% times additional years of service converted from leave in excess of 30 years. The sum of these three parts cannot exceed 85%, including credit for unused leave. Members hired before January 4, 1995, will receive the benefit percentage as if they retired on December 31, 2013.	1.2% of Average Annual Compensation (high 36 months' base) times years of service (not to exceed 30).

## Brief Summary of Plan Provisions

	<u>Comprehensive Plan</u>	<u>Supplemental Plan</u>
5. Annual Retirement Benefits: (Cont'd)		
b. Disability –	<p><u>Service-Connected</u> – 70% of Average Annual Compensation for the first year, and 60% thereafter.</p> <p><u>Non-Service-Connected</u> – The greater of the accrued normal retirement benefit or 30% of Average Annual Compensation.</p>	Accrued normal retirement benefit, based on service and Compensation to date of disability.
6. Termination Benefits:		
a. Under 5 years of credited service –	Return of employee contributions with interest.	Return of employee contributions with interest.
b. 5 or more years of credited service –	If contributions are left in the fund, an employee is entitled to a vested benefit payable at Normal Retirement Date equal to the benefit accrued to date of termination.	If contributions are left in the fund, an employee is entitled to a vested benefit payable at Normal Retirement Date equal to the benefit accrued to date of termination.
7. Additional Benefits for Employees Retiring on or after July 1, 1996:	An eligible employee will receive an increased monthly pension based on accumulated sick and annual leave. 40 hours of annual leave or 80 hours of sick leave are convertible to one month of credited service.	No provision.
8. Death Benefits:	<p>Return of employee contributions with interest, less any benefits paid prior to death. Also, if an employee dies after Normal Retirement Date while still employed, his spouse receives a lifetime benefit equal to 50% of the employee's pension, reduced for election of the joint and survivor form of payment.</p> <p>Effective July 1, 2008, the spouse of a participant, whose death is a death in the line of duty, is eligible for a pre-retirement survivor annuity. The benefit is payable immediately and equals 100% of the employee pension assuming the employee had exactly 20 years of service, reduced for election of a joint and contingent annuity payment.</p>	Return of employee contributions with interest, less any benefits paid prior to death.

## Brief Summary of Plan Provisions

	<u>Comprehensive Plan</u>	<u>Supplemental Plan</u>																																												
9. Payment of Retirement Benefits:	The normal form of payment is for the life of the participant only. An actuarially reduced joint and 50% surviving spouse form of payment may be elected.	The normal form of payment is for the life of the participant only. An actuarially reduced joint and 50% surviving spouse form of payment may be elected.																																												
10. Employee Contributions:	10.0% of base pay (11.0% of base pay for employees hired on or after July 1, 2005).	5.2% of base pay.																																												
11. Post-Retirement Increases:	<p>Effective February 1, 1998, and every year thereafter, retirees will receive an increase in their benefit based on two-thirds (2/3) of total investment returns during the prior plan year in excess of the actuarial assumption annually. All eligible retirees and eligible spouses will receive an identical dollar increase, not to exceed \$100 per month (\$125 per month commencing February 1, 2000). No increase will be provided if the available amount is not sufficient to provide at least a \$10 per month increase. Also, any shortfall of investment return versus the actuarial assumption will be carried over to future determinations.</p> <p>This provision has resulted in the following increase:</p> <table><tr><th><u>Effective Date</u></th><th><u>Monthly Amount</u></th></tr><tr><td>2/1/1998</td><td>\$100.00</td></tr><tr><td>2/1/1999</td><td>100.00</td></tr><tr><td>2/1/2000</td><td>125.00</td></tr><tr><td>2/1/2001</td><td>0.00</td></tr><tr><td>2/1/2002</td><td>0.00</td></tr><tr><td>2/1/2003</td><td>0.00</td></tr><tr><td>2/1/2004</td><td>0.00</td></tr><tr><td>2/1/2005</td><td>0.00</td></tr><tr><td>2/1/2006</td><td>0.00</td></tr><tr><td>2/1/2007</td><td>0.00</td></tr><tr><td>2/1/2008</td><td>0.00</td></tr><tr><td>2/1/2009</td><td>0.00</td></tr><tr><td>2/1/2010</td><td>0.00</td></tr><tr><td>2/1/2011</td><td>0.00</td></tr><tr><td>2/1/2012</td><td>0.00</td></tr><tr><td>2/1/2013</td><td>0.00</td></tr><tr><td>2/1/2014</td><td>0.00</td></tr><tr><td>2/1/2015</td><td>0.00</td></tr><tr><td>2/1/2016</td><td>0.00</td></tr><tr><td>2/1/2017</td><td>0.00</td></tr><tr><td>2/1/2018</td><td>0.00</td></tr></table>	<u>Effective Date</u>	<u>Monthly Amount</u>	2/1/1998	\$100.00	2/1/1999	100.00	2/1/2000	125.00	2/1/2001	0.00	2/1/2002	0.00	2/1/2003	0.00	2/1/2004	0.00	2/1/2005	0.00	2/1/2006	0.00	2/1/2007	0.00	2/1/2008	0.00	2/1/2009	0.00	2/1/2010	0.00	2/1/2011	0.00	2/1/2012	0.00	2/1/2013	0.00	2/1/2014	0.00	2/1/2015	0.00	2/1/2016	0.00	2/1/2017	0.00	2/1/2018	0.00	No provision.
<u>Effective Date</u>	<u>Monthly Amount</u>																																													
2/1/1998	\$100.00																																													
2/1/1999	100.00																																													
2/1/2000	125.00																																													
2/1/2001	0.00																																													
2/1/2002	0.00																																													
2/1/2003	0.00																																													
2/1/2004	0.00																																													
2/1/2005	0.00																																													
2/1/2006	0.00																																													
2/1/2007	0.00																																													
2/1/2008	0.00																																													
2/1/2009	0.00																																													
2/1/2010	0.00																																													
2/1/2011	0.00																																													
2/1/2012	0.00																																													
2/1/2013	0.00																																													
2/1/2014	0.00																																													
2/1/2015	0.00																																													
2/1/2016	0.00																																													
2/1/2017	0.00																																													
2/1/2018	0.00																																													

## Brief Summary of Plan Provisions

---

### Comprehensive Plan

### Supplemental Plan

12. 13<sup>th</sup> Check:

Retirees received a one-time distribution of a thirteenth (13<sup>th</sup>) check for four hundred twenty dollars (\$420.00) in Fiscal Years 2008 and 2009.

No provision.

## SECTION C.

---

### ACTUARIAL ASSUMPTIONS AND METHODS



## Actuarial Assumptions and Methods

The actuarial assumptions and methods are first effective with the actuarial valuation as of July 1, 2018, and are based on the experience study for the period July 1, 2013 to July 1, 2017.

1. **Interest:** 7.25 percent compounded annually, net of investment expenses (based on assumed price inflation assumption of 2.50 percent).
2. **Mortality:** The mortality assumptions are based on the following Public Sector 2010 Mortality tables. The rates are projected from 2010 using projection scale MP-2018 (generational mortality) and therefore include a provision for future mortality improvement.

Type	Assumption
Post-retirement non-disabled	Pub-2010 Healthy Retiree Mortality Table (for Safety Employees), sex distinct
Post-retirement disabled	Pub-2010 Disabled Retiree Mortality Table (for Safety Employees), sex distinct
Pre-retirement non-service connected	Pub-2010 Employee Mortality Table (for Safety Employees), sex distinct
Pre-retirement service connected	10% of the rates from the Pub-2010 Employee Mortality Table (for Safety Employees), sex distinct

3. **Expenses:** Non-investment expenses equivalent to 105 percent of the average administrative expenses incurred in the last three fiscal years as supplied by the County and incorporated in the Normal Cost.

### Comprehensive Plan:

Valuation	Actual Administrative Expenses				Assumed Expenses
Year	3 Years Prior	2 Years Prior	1 Year Prior	3-Year Average	Added to Normal Cost
2017	\$ 220,964	\$ 280,425	\$ 211,728	\$ 237,706	\$ 249,600
2018	280,425	211,728	172,591	221,581	232,700

### Supplemental Plan:

Valuation	Actual Administrative Expenses				Assumed Expenses
Year	3 Years Prior	2 Years Prior	1 Year Prior	3-Year Average	Added to Normal Cost
2017	\$ 31,774	\$ 31,822	\$ 34,008	\$ 32,535	\$ 34,200
2018	31,822	34,008	38,378	34,736	36,500

## Actuarial Assumptions and Methods

---

### 4. Salary Scale:

The following illustrative annual rates of salary increase were used:

<u>Service</u>	<u>Salary Increase</u>
1-2	5.50%
3-6	7.00%
7-10	9.00%
11-14	7.25%
15-30	5.50%
31+	3.00%

### 5. Turnover:

The following illustrative annual rates of withdrawal were used (includes disability for Supplemental Plan):

<u>Service Beginning of Year</u>	<u>Percentage of Employees Terminating Employment Annually</u>
0	12.00%
1	7.00%
2	6.00%
3	4.00%
4	3.75%
5	3.50%
6	3.25%
7	3.00%
8	2.75%
9	2.50%
10	0.75%
11	0.75%
12	0.75%
13	0.75%
14	0.75%
15+	0.50%

## Actuarial Assumptions and Methods

6. **Disability:** The following illustrative annual rates of disability were used for the Comprehensive Plan:

### Rate of Disability Per 1,000 Participants

Age	Total	Service Connected	Non-Service Connected
Under 25	1.00	0.90	0.10
25-29	2.50	2.25	0.25
30-34	7.50	6.75	0.75
35-39	15.00	13.50	1.50
40-44	20.00	18.00	2.00
45-49	20.00	18.00	2.00
50-54	20.00	18.00	2.00
55-59	20.00	18.00	2.00
60+	20.00	18.00	2.00

7. **Retirement Age:** The following illustrative annual rates of retirement were used and are based on member retirement eligibility conditions (Supplemental Plan members use the age 55 and 20 years of service rates):

Service	Earlier of Age 55 and 20 yrs	Earlier of Age 55 and 25 yrs	
	Retirement Rate	First Elg.	Ultimate Rate
5 - 19	15.0%	15.0%	15.0%
20	25.0%	25.0%	25.0%
21	15.0%	35.0%	15.0%
22	15.0%	45.0%	15.0%
23	15.0%	50.0%	15.0%
24	15.0%	60.0%	15.0%
25	15.0%	65.0%	15.0%
26 - 29	15.0%		15.0%
30 - 34	30.0%		30.0%
35+	100.0%		100.0%

50 percent retirement is assumed beginning at age 65 and 100 percent retirement is assumed at 35 years of service.

8. **Asset Valuation Method:** The calculated value is determined by adjusting the market value of assets to reflect the investment gains and losses (the difference between the actual investment return and the expected investment return) during each of the last five years at the rate of 20 percent per year. A corridor is then applied

## Actuarial Assumptions and Methods

---

to the calculated value such that it is not greater than 120 percent or less than 80 percent of the market value of assets.

9. **Cost Method:** Entry age normal cost method, under which the normal cost as a percentage of pay for each employee remains level from entry age to retirement, and the accrued liability represents the fund which would now be on hand if all past normal costs had actually been paid, and all current assumptions had been realized.
10. **Amortization Method:** 30-Year Closed, Level Percentage of Payroll as of July 1, 2014. (13-Year Closed, Level Dollar for the Supplemental Plan as of July 1, 2011.)
11. **Payroll Growth:** Total payroll is assumed to increase by 3.0 percent per year.
12. **Benefit Service:** Exact fractional years of service are used to determine the amount of benefit payable.
13. **Decrement Timing:** All decrements are assumed to occur mid-year.
14. **Decrement Relativity:** Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
15. **Decrement Operation:** Turnover decrement does not operate after member reaches retirement eligibility.
16. **Eligibility Testing:** Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.
17. **Marriage Assumption:** 85 percent of members are assumed to be married for purposes of valuing death-in-service benefits. The male spouse is assumed to be three years older than the female spouse. (This applies to the Comprehensive Plan only.)
18. **Pay Increase Timing:** End of (fiscal) year.
19. **Unused Leave:** Employees retiring with 20 or more years of County service are assumed to have unused leave equivalent to additional years of credited service based on the number of years of service at retirement.

<b>Years at Retirement</b>	<b>20-24 Years</b>	<b>25+ Years</b>
Deputy Sheriff's Comprehensive	4.0 Years	5.0 Years
Deputy Sheriff's Supplemental	None	None

## Actuarial Assumptions and Methods

---

Sick leave hours in excess of the service cap are refunded at the rate of pay at retirement times hours of excess sick leave. Excess sick leave hours are determined using the assumption that 55 hours of sick leave time is equal to 1 month of additional service credit.

**20. Data Adjustments/Missing Data:**

A minimum salary of \$47,932 was used for active participants for valuation purposes.

The actuarial accrued liability for Comprehensive retired participants includes an amount of \$824,012 for inactive/deferred members reported with a benefit of \$0 as of July 1, 2018, who are expected to receive a future refund payout.

The actuarial accrued liability for Supplemental retired participants includes an amount of \$206,323 for inactive/deferred members reported with a benefit of \$0 as of July 1, 2018, who are expected to receive a future refund payout.

## SECTION D.

---

### GLOSSARY OF TERMS

## Glossary of Terms

---

**Actuarial Accrued Liability (AAL).** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as “accrued liability” or “past service liability.”

**Actuarial Assumptions.** Estimates of future plan experience such as investment return, expected lifetimes and the likelihood of receiving a pension from the Pension Plan. Demographic, or “people” assumptions, include rates of mortality, retirement and separation. Economic, or “money” assumptions, include expected investment return, inflation and salary increases.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the “actuarial present value of future plan benefits” between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the “actuarial funding method.”

**Actuarial Present Value of Future Plan Benefits.** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Actuarial Value of Assets (AVA).** Smoothed value of assets that recognizes the difference between the expected investment return using the valuation assumption and the actual investment return over a five-year period. Dampens volatility of asset value over time.

**Amortization.** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

**Annual Required Contribution.** The sum of the normal cost and amortization of the unfunded actuarial accrued liability.

**Asset Return.** The net investment return for the asset divided by the mean asset value. Example: if \$1.00 is invested and yields \$1.07 after a year, the asset return is 7.00 percent.

**Funded Ratio.** The actuarial value of assets divided by the actuarial accrued liability. Measures the portion of the actuarial accrued liability that is currently funded.

**Market Value of Assets (MVA).** The value of assets currently held in the trust available to pay for benefits of the Pension Plan. Each of the investments in the trust is valued at market price which is the price at which buyers and sellers trade similar items in the open market.

**Normal Cost (NC).** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as “current service cost.” Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Unfunded Actuarial Accrued Liability (UAAL).** The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as “unfunded accrued liability.”