

Delaware County & Municipal Police/ Firefighters Pension Plan

Actuarial Valuation as of June 30, 2018

Produced by Cheiron

January 2019

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January 15, 2019

Board of Pension Trustees
State of Delaware
McArdle Building
860 Silver Lake Boulevard, Suite 1
Dover, Delaware 19904

Dear Members of the Board:

At your request, we have conducted the annual actuarial valuation of the Delaware County & Municipal Police/Firefighters Pension Plan (Plan) as of June 30, 2018. The results of this valuation are contained in this report. The purpose of the valuation is discussed in the Foreword.

This report contains information on plan assets and liabilities, as well as analyses combining asset and liability performance and projections. It also discloses employer contribution levels and certain required disclosures under the Governmental Accounting Standards Board (GASB) Statement No. 67.


In completing the valuation and preparing our report, we relied on information, some oral and some written, supplied by staff of the Office of Pensions. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

The contribution results of this report are only applicable to the employer contributions for Fiscal Year (FY) 2020 and rely on future plan experience conforming to the underlying assumptions. Future experience may differ significantly from the current experience due to such factors as the following: program experience differing from that anticipated by the assumptions; changes in assumptions; and changes in program provisions or applicable law.


To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board, including the use of assumptions and methods for funding purposes that comply with the Actuarial Standards of Practice. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinions contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared for the Delaware County & Municipal Police/Firefighters Pension Plan for the purposes described herein and for the use by the Plan's auditor in completing an audit related to the matters herein. Other users of this valuation report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

Sincerely,
Cheiron



Fiona E. Liston, FSA, MAAA, EA
Principal Consulting Actuary



Elizabeth Wiley, FSA, FCA, MAAA, EA
Consulting Actuary

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

FOREWORD

Cheiron has performed the annual actuarial valuation of the Delaware County & Municipal Police/Firefighters Pension Plan (Plan) as of June 30, 2018. The purpose of this report is to:

- 1) **Measure and disclose**, as of the valuation date, the financial condition of the Plan,
- 2) **Indicate trends** in the financial condition of the Plan,
- 3) **Determine the contribution rate** to be paid by the participating employers for Fiscal Year (FY) 2020, and
- 4) **Provide** certain accounting statement information.

An actuarial valuation establishes and analyzes plan assets and liabilities on a consistent basis and traces the progress of both from one year to the next. It includes measurement of the plan's investment performance as well as an analysis of liability gains and losses.

Section I presents a summary containing our findings and disclosing important trends experienced by the Plan in recent years.

Section II contains details on various asset measures, together with pertinent performance measurements.

Section III shows similar information on liabilities, measured for actuarial, accounting, and governmental reporting purposes.

Section IV presents the FY 2020 actuarially determined contribution for participating employers.

Section V includes certain required disclosures under Governmental Accounting Standards Board (GASB) Statement No. 67 and items recommended by the Government Finance Officers Association (GFOA).

The appendices to this report contain a summary of the Plan's membership at the valuation date, a summary of the major provisions of the Plan, and a summary of the actuarial methods and assumptions used in the valuation.

The actuarial assumptions reflect our understanding of the likely future experience of the Plan, and the assumptions individually and as a whole represent our best estimate for the future experience of the Plan. The results of this report rely on future plan experience conforming to the underlying assumptions and methods outlined in this report. To the extent that the actual plan experience deviates from the underlying assumptions and methods, or there are any changes in plan provisions, the true cost of the Plan will vary from our results.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

General Comments

The actuarially determined contribution (ADC) rate was calculated to increase from 16.68% for FY 2019 to 16.84% for FY 2020.

During the year ended June 30, 2018, the Plan's assets earned 10.4% on a market value basis. However, due to the Plan's asset smoothing method, which recognizes portions of the investment gains and losses over time, the return on an actuarial value basis was 7.3%. This return was greater than the assumed investment rate of return of 7.0% for the prior year, resulting in an actuarial gain on investments of \$1.0 million.

The Plan experienced an actuarial gain on plan liabilities resulting from salary increases different from those assumed and members retiring, terminating, becoming disabled, and dying at rates different from the actuarial assumptions. This liability gain decreased the actuarial liability by \$1.0 million, 0.3% of the total actuarial liability.

This valuation report also contains certain information to be reported in the June 30, 2018 Comprehensive Annual Financial Report (CAFR) of the Delaware Public Employees' Retirement System (Delaware PERS) under GASB Statement No. 67, as well as additional disclosure information recommended by the Government Finance Officers Association (GFOA). The GASB disclosures are based on the use of update procedures to roll forward the 2017 actuarial valuation liability results. The calculation of net pension liability in Section V is shown as disclosed for the plan year ending June 30, 2018, based on the 2017 funding actuarial valuation liability results. We also present a projection of the June 30, 2019 disclosure in Section V, assuming all actuarial assumptions are exactly met over the coming year, which is based on the 2018 funding actuarial valuation liability results.

As of the June 30, 2018 funding actuarial valuation, the unfunded actuarial liability (UAL) was \$26.0 million. This is an increase from the \$24.1 million UAL in the funding valuation for the prior year.

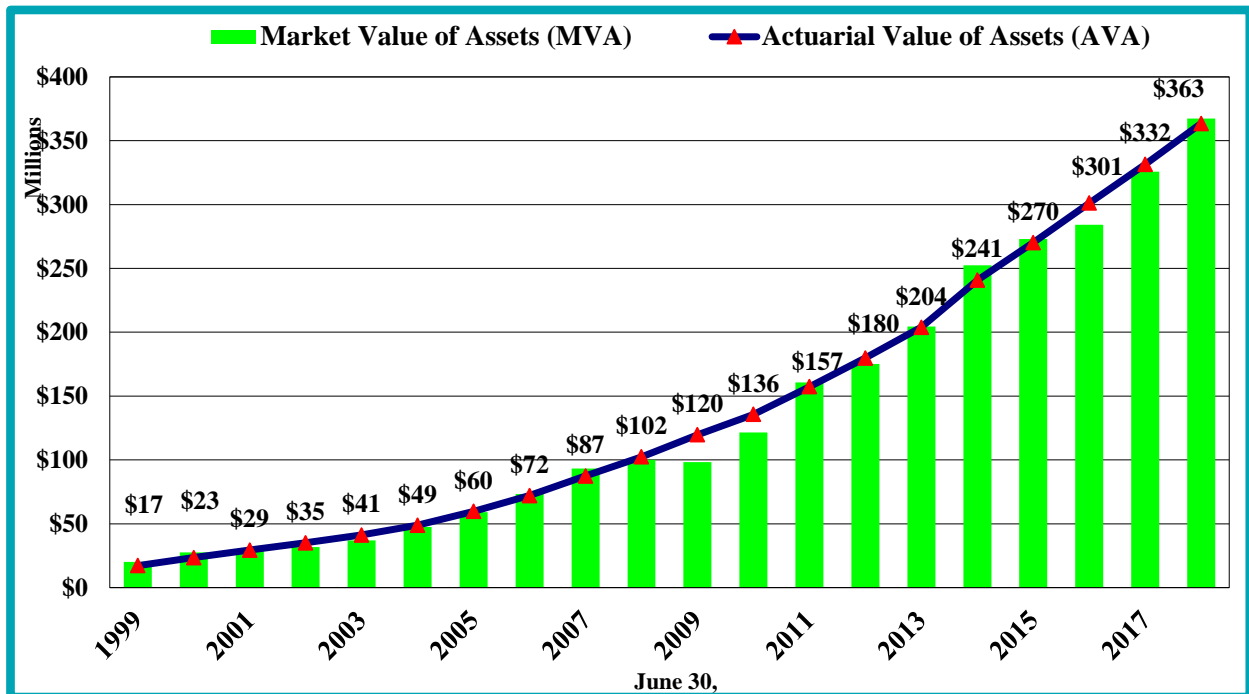
DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018

SECTION I – BOARD SUMMARY

Trends

Asset Returns

The graph below shows measurements of the Plan’s assets over the last 20 years based on both market values and actuarial values. The green bars represent the market value measurements, while the blue line shows the smoothed actuarial value measurements. The black labels above the blue line are the actuarial value of asset measurements as of the valuation date for each year in millions of dollars.



The market value of assets (MVA) returned 10.4% over the last year. The determination of the Plan’s actuarial value of assets (AVA) for the current year reflects a portion of the return above the 7.0% assumed for the prior year, and continued recognition of prior years’ gains and losses, and thus returned 7.3% over FY 2018.

Over the period July 1, 1999 to June 30, 2018, the Plan’s assets measured using the actuarial value of assets measurements returned a compound 7.6%, compared to the current valuation assumption of 7.0%. On a market value of assets basis, the Plan returned 6.7% over the same period.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

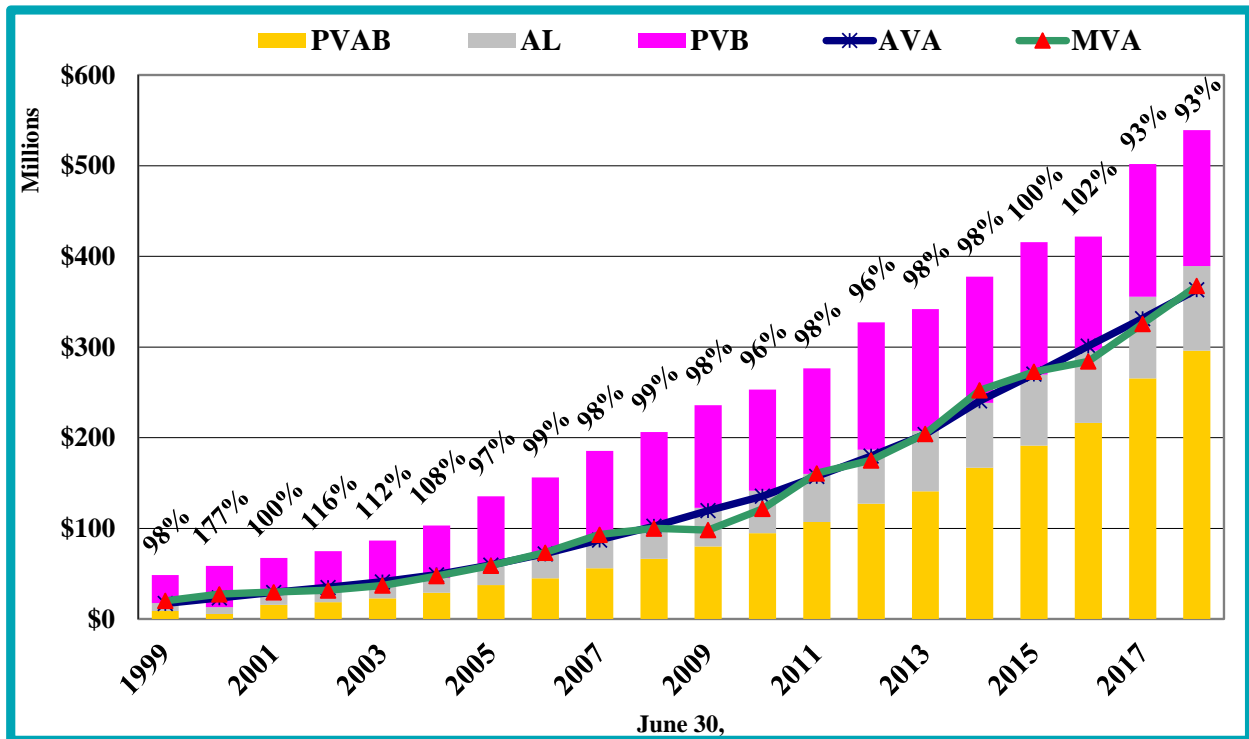
SECTION I – BOARD SUMMARY

Assets and Liabilities

The three colored bars below represent the three different measures of liability discussed in this report. The first measure is given by the yellow bars, the present value of accrued benefits (PVAB). The PVAB values represent the value of all benefits earned by current members through the valuation date. These values do not reflect any future additional service or salary increases for current members beyond the valuation dates.

The second liability measure shown is the one currently used for the Plan’s funding target, the actuarial liability (AL). These target amounts are represented by the top of the gray bars. This measurement is also the basis of the liability measure used in GASB 67. The funded ratios reported by the Plan are the percentages shown above the bars and are developed by comparing these target measurements of liability to the actuarial value of assets at each valuation date.

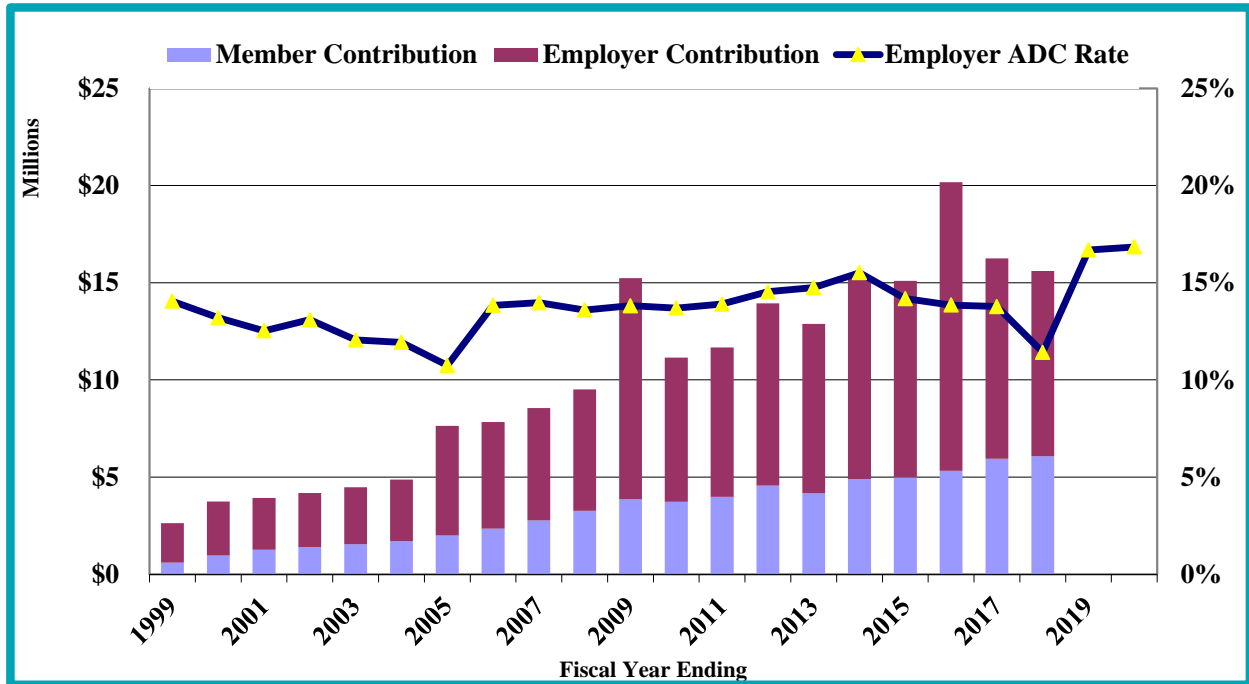
The amount represented by the top of the pink bars, the present value of future benefits (PVB), is the amount needed as of each valuation date to provide all benefits for the current members and their beneficiaries, including reflection of assumed future service and pay increases. If the Plan had assets equal to the PVB as of a certain date, no additional contributions would, in theory, be needed to pay the benefits of the current members if all assumptions were exactly met from that point forward.



DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
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SECTION I – BOARD SUMMARY

Contribution Rates



The stacked bars in the graph above show the actual dollar amounts of the contributions made by the participating employers and the members for each fiscal year and are read using the left-hand scale. The blue line shows the employer actuarially determined contribution (ADC) rate for each fiscal year as a percentage of payroll and is read using the right-hand scale.

The member contribution rate is set by State law, based on the plan in which the member participates. The participating employer contribution rate is set by the actuarial process. Please note that there is a lag between the State contribution rates shown are calculated and when they are payable. For example, the value shown for the FY 2018 is the rate prepared by the June 30, 2016 valuation and implemented for the period July 1, 2017 to June 30, 2018. As such, there are two more years of rates shown beyond the years of actual contributions.

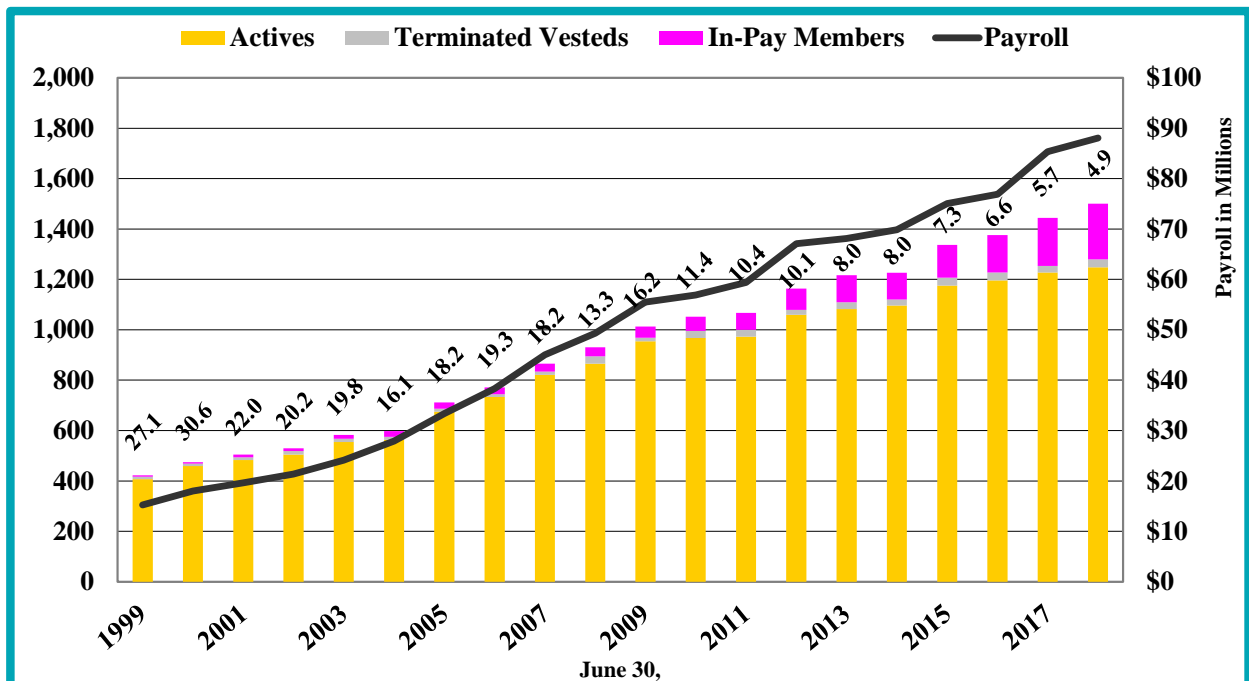
**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

Participant Trends

The bars below show the number of members as of each valuation date, divided between active members, terminated vested members, and retirees/beneficiaries. These bars are read using the left-hand scale. Since this is a relatively young plan, there are still many more actives than there are retirees. However, as this Plan continues to mature, this Plan will continue to show growth in the number of inactive members. The numbers that appear above each bar represent the ratio of active members to inactive members (retirees, beneficiaries, and terminated vested members) at each valuation date. The active-to-inactive ratio has decreased from 27.1 actives for each inactive in 1999 to 4.9 actives for each inactive in 2018.

The black line shows the covered payroll for the Plan as of each valuation date and is read using the right-hand scale.

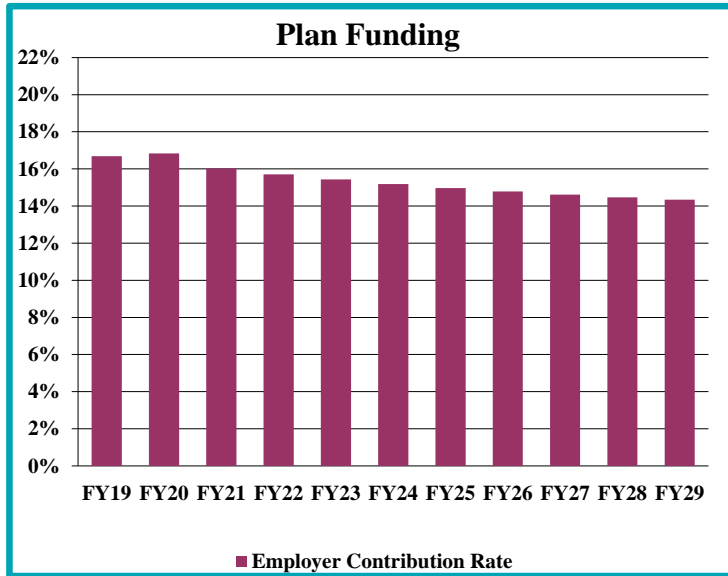


**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

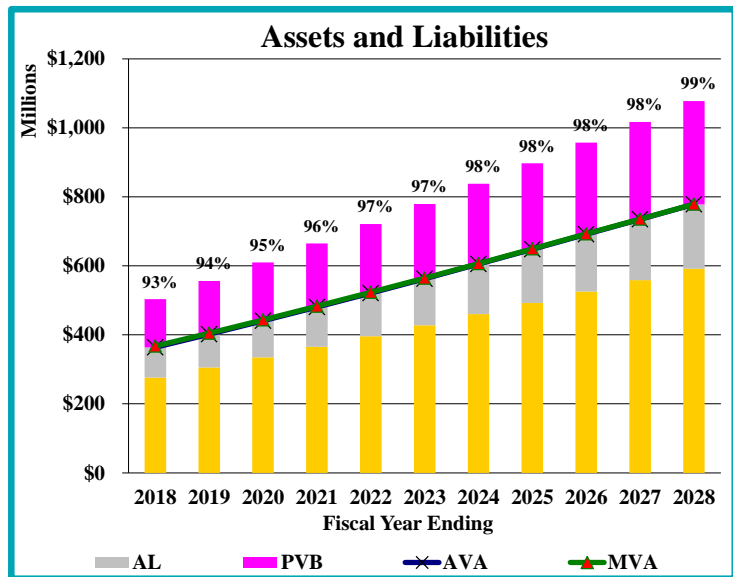
Future Outlook

Base Line Projections



These graphs show the expected progress of the Plan over the next 10 years, assuming the Plan’s assets earn 7.0% on a *market value* basis and assuming all other assumptions are exactly met, including that the actuarially determined contribution (ADC) amounts are made in full. The chart entitled “Plan Funding” shows a gradual decline in the projected employer ADC rate from 16.84% in FY 2020, determined by the current valuation, to 14.34% at the end of this 10-year period, absent further gains or losses.

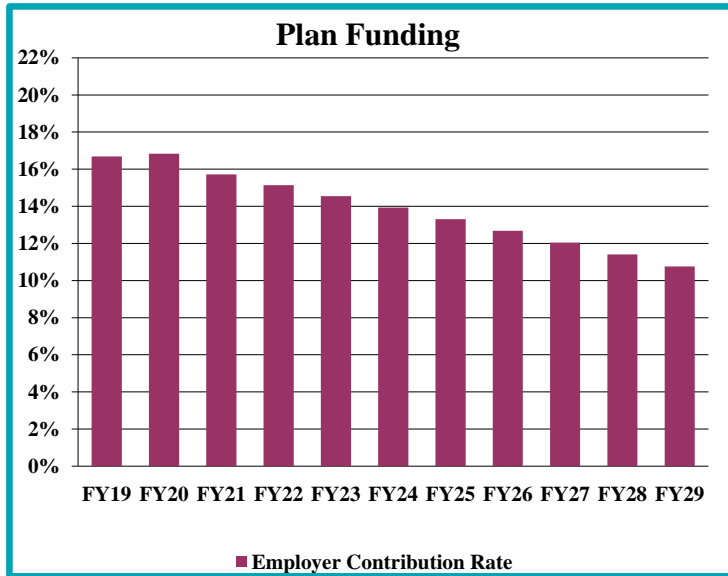
The “Assets and Liabilities” graph shows the projected funded ratios for the Plan over the 10-year projection period. The Plan’s funded status is projected to increase from 93% to 99% over the 10-year projection period, assuming all assumptions are exactly met.



**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
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SECTION I – BOARD SUMMARY

Projections with Asset Returns of 8.0%

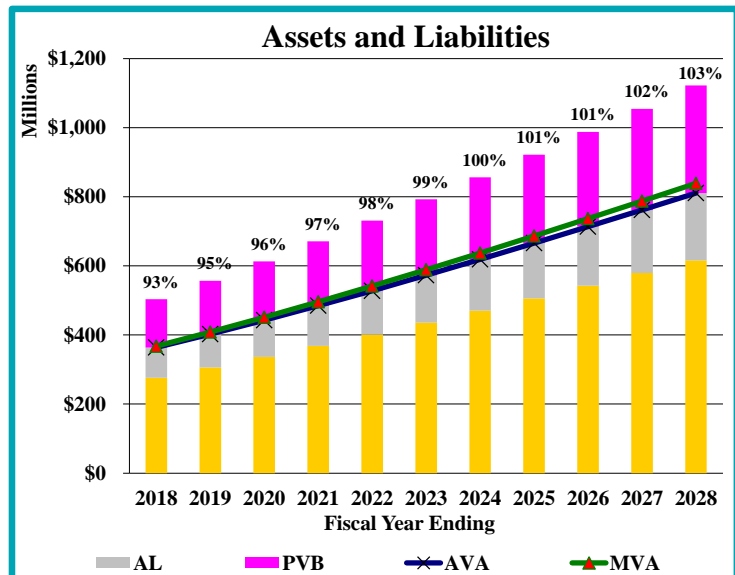


The Plan’s investment earnings will affect the future funding status of the Plan. The two graphs on this page show what the next 10 years are expected to look like if the Plan’s investment performance is 8.0% each year, 1.0% higher than the valuation investment rate of return assumption.

These two graphs assume all other assumptions are exactly met, including participating employer contributions made equal to the full actuarially determined amounts.

The “Plan Funding” graph shows that under this scenario, the employer ADC rate would decrease more rapidly than in the baseline case. The rate declines to 10.77% of payroll at the end of the 10-year projection period.

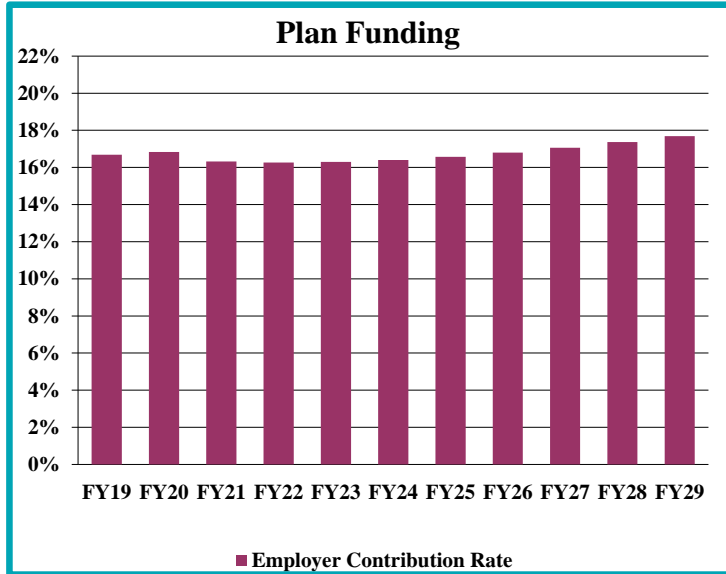
The “Assets and Liabilities” graph shows that under this scenario, the Plan would reach a 103% funded ratio by 2028, an improvement over the baseline scenario’s ultimate level of 99%.



**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

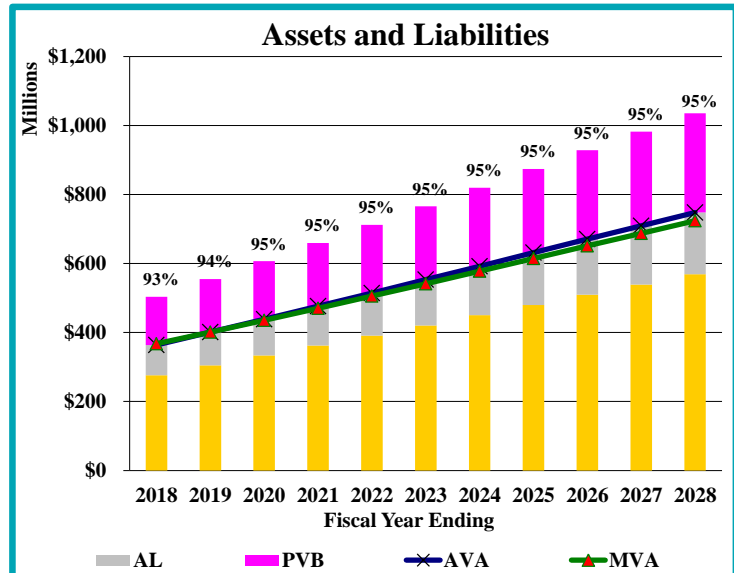
Projections with Asset Returns of 6.0%



The graphs on this page show projections of the Plan’s funding status and contributions assuming that the Plan’s investment performance is 6.0% each year of the projection, 1.0% lower than the valuation investment rate of return assumption.

Note that these projections assume all other assumptions are exactly met, including payment of participating employer contributions made equal to the full actuarially determined contribution.

Under this scenario, the employer ADC rate increases to approximately 17.69% of payroll by the end of the 10-year projection period, significantly greater than the 14.34% ultimate rate in the baseline projection. Additionally, the funded ratio is projected to stabilize at 95% at the end of the 10-year projection period, lower than the 99% ultimate funded ratio in the baseline scenario.



**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION I – BOARD SUMMARY

**Table I-1
Summary of Principal Plan Results**

Valuation as of:	June 30, 2017	June 30, 2018	% Change
<u>Member Counts</u>			
Active Members	1,228	1,248	1.63%
Disabled Members	30	35	16.67%
Retirees and Beneficiaries	160	187	16.88%
Terminated Vested Members	27	31	14.81%
Terminated Non-Vested Members	8	16	100.00%
Total Member Counts	1,453	1,517	4.40%
Covered Payroll of Active Members*	\$ 85,353,900	\$ 88,046,000	3.15%
Annual Benefit Payments for Retirees, Disabled Members, and Beneficiaries	\$ 6,707,800	\$ 8,169,100	21.79%
<u>Assets and Liabilities</u>			
Actuarial Liability (AL)	\$ 355,638,100	\$ 389,498,000	9.52%
Actuarial Value of Assets (AVA)	331,534,300	363,496,500	9.64%
Unfunded AL (UAL)	\$ 24,103,800	\$ 26,001,500	7.87%
Funded Ratio on AVA Basis (AVA/AL)	93.2%	93.3%	
Funded Ratio on MVA Basis (MVA/AL)	91.6%	94.3%	
Present Value of Accrued Benefits (PVAB)	\$ 265,354,200	\$ 296,080,600	11.58%
Market Value of Assets (MVA)	325,815,900	367,469,700	12.78%
Unfunded PVAB	\$ (60,461,700)	\$ (71,389,100)	(18.07)%
Accrued Benefit Funded Ratio (MVA/PVAB)	122.8%	124.1%	
<u>Employer Contribution Rate</u>			
	Fiscal Year 2019	Fiscal Year 2020	
Entry Age Normal Cost	12.92%	12.91%	
UAL Amortization Payment	3.51%	3.68%	
Administrative Expense	0.25%	0.25%	
Actuarially Determined Contribution (ADC)	16.68%	16.84%	

* Assumes one year of payroll increase projection, representing payroll beginning on each valuation date.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Pension plan assets play a key role in the financial operation of the Plan and in the decisions that the Board of Trustees may make with respect to future deployment of those assets. The level of assets, the allocation of assets among asset classes, and the methodology used to measure assets will likely affect benefit levels, employer actuarially determined contributions, and the ultimate security of members’ benefits.

In this section, we present detailed information on the Plan’s assets including:

- **Disclosure** of the Plan’s assets at June 30, 2017 and June 30, 2018,
- Statement of the **changes** in market values during FY 2018,
- Development of the **actuarial value of assets**,
- An assessment of **investment performance**, and
- A projection of the Plan’s expected **cash flows** for the next 10 years.

Market Value of Assets Disclosure

The market values of assets represent “snap-shot” or “cash-out” values that provide the principal basis for measuring financial performance from one year to the next. However, market values can fluctuate widely with swings in the marketplace, and as such, are usually not suitable for budgeting and long-range planning.

Table II-1 below shows the market values as of June 30, 2017 and June 30, 2018, along with the changes between the two.

Table II-1 Changes in Market Values of Assets		
Market Value of Assets – June 30, 2017		\$ 325,815,900
<u>Additions</u>		
Member Contributions	\$ 6,067,800	
Employer Contributions	9,535,200	
Investment Returns	<u>34,154,800</u>	
Total Additions	\$ 49,757,800	
<u>Deductions</u>		
Benefit Payments	\$ 7,958,900	
Administrative Expenses	<u>145,100</u>	
Total Deductions	\$ 8,104,000	
Market Value of Assets – June 30, 2018		\$ 367,469,700

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Actuarial Value of Assets

The actuarial value of assets represents a “smoothed” value developed by the actuary to reduce, or eliminate, erratic results that could develop from short-term fluctuations in the market value of assets. The actuarial value for this plan equals the expected actuarial value of assets, developed from the immediately prior valuation, plus 20% of the difference between the actual market value of assets and that expected actuarial value of assets at the valuation date. The table below illustrates the calculation of the actuarial value of assets as of June 30, 2018.

Table II-2 Development of Actuarial Value of Assets		
1.	Actuarial Value of Assets at June 30, 2017	\$ 331,534,300
2.	Amount in (1) with interest to June 30, 2018 at 7.0% per year	354,741,700
3.	Employer and member contributions for FY 2018	15,603,000
4.	Interest on contributions assuming payments made uniformly throughout the year to June 30, 2018 at 7.20% per year	546,100
5.	Disbursements from Trust except investment expenses, July 1, 2017 through June 30, 2018	8,104,000
6.	Interest on disbursements to June 30, 2018 at 7.0% per year	<u>283,600</u>
7.	Expected Actuarial Value of Assets at June 30, 2018 = (2) + (3) + (4) – (5) – (6)	\$ 362,503,200
8.	Actual Market Value of Assets at June 30, 2018	<u>\$ 367,469,700</u>
9.	Excess of (8) over (7)	\$ 4,966,500
10.	Actuarial Value of Assets at June 30, 2018 = (7) + 20% of (9)	\$ 363,496,500

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION II – ASSETS

Investment Performance

The market value of assets (MVA) returned 10.4% during 2018, which is more than the prior year’s assumed 7.0% investment rate of return. The actuarial value of assets (AVA) returned 7.3% over this same year, reflecting the asset smoothing methodology being utilized by the Plan for the measurement of the actuarial value of assets. Since a maximum of 20% of the gain or loss from the performance of the Plan is typically recognized in a given year under the adopted asset smoothing method, in periods of very good performance, the AVA can lag significantly behind the MVA, and in a period of negative returns, the AVA does not decline as rapidly as the MVA.

Projection of Cash Flows

Table II-3 Cash Flow Projections		
Year Beginning July 1,	Expected Benefit Payments	Expected Contributions*
2018	\$ 9,457,000	\$ 20,854,000
2019	11,118,000	21,519,000
2020	13,003,000	22,057,000
2021	14,955,000	22,609,000
2022	17,039,000	23,174,000
2023	19,336,000	23,753,000
2024	21,867,000	24,347,000
2025	24,920,000	24,956,000
2026	28,117,000	25,580,000
2027	31,241,000	26,219,000

* Expected contributions include participating employer contributions and member contributions. For illustration purposes, we have assumed the employer contribution rate will remain at 16.84% from FYE 2020 forward and that payroll will increase at the actuarially assumed rate of 2.50% per year.

Expected benefit payments are projected for the closed group valued at June 30, 2018. Projecting any further than 10 years using a closed group would not yield reliable projections due to the omission of new hires in the benefit payments, compounded by their inclusion in the expected contributions.

SECTION III – LIABILITIES

In this section, we present detailed information on the Plan's liabilities for funding purposes, including:

- **Disclosure** of the Plan's liabilities at June 30, 2017 and June 30, 2018, and
- Statement of **changes** in these liabilities during the year.

Disclosure

Three liability measurements are calculated and presented in this report. Each type is distinguished by the purpose, or purposes, for which they are used.

- **Present Value of Benefits (PVB):** Used for analyzing the financial outlook of plans, this represents the amount of money needed today to fund all future benefits and expenses of a plan, assuming current members continue to accrue benefits and there are no new entrants, and that all actuarial assumptions are met.
- **Actuarial Liability (AL):** Used for funding calculations for a plan and GASB disclosures, this liability is calculated by taking the present value of benefits (PVB) and subtracting the present value of future member contributions (PVFEEC) and the present value of future employer normal costs (PVFNC) under an acceptable actuarial funding method. The Plan uses the **Entry Age Normal** funding method.
- **Present Value of Accrued Benefits (PVAB):** Used for communicating the current level of liabilities, this liability represents the total amount of money needed today to fully fund the current accrued obligations of a plan, assuming no future accruals of benefits or salary increases. These liabilities are also required for some accounting purposes of some plans (Topic No. 960). This Plan is not subject to this requirement, but this information is provided for informational purposes, as it is sometimes used as part of assessing whether a plan can meet its current benefit commitments. However, it is not intended as a settlement liability value. Note that the development of this amount also assumes that all actuarial assumptions are met, including the assets earning 7.0% per year.

None of the liability amounts disclosed in this report is appropriate for measuring a settlement of the Plan's liabilities.

The following table discloses each of these liabilities for the current and immediately prior funding valuations. With respect to each disclosure, a subtraction of an appropriate value of plan assets yields, for each respective type, either a net surplus or an unfunded amount.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION III – LIABILITIES

**Table III-1
Liabilities and Net (Surplus)/Unfunded Amount**

	June 30, 2017	June 30, 2018
<u>Present Value of Benefits</u>		
Active Member Benefits	\$ 416,843,400	\$ 435,110,000
Retiree, Beneficiary, Disabled, and Terminated Members Benefits	<u>85,102,400</u>	<u>104,127,300</u>
Present Value of Benefits (PVB)	\$ 501,945,800	\$ 539,237,300
Market Value of Assets (MVA)	\$ 325,815,900	\$ 367,469,700
Future Member Contributions	51,499,100	52,723,900
Future Employer Contributions	<u>124,630,800</u>	<u>119,043,700</u>
Total Resources	\$ 501,945,800	\$ 539,237,300
<u>Actuarial Liability</u>		
Present Value of Benefits (PVB)	\$ 501,945,800	\$ 539,237,300
Present Value of Future Employer Normal Costs (PVFNC)	94,808,600	97,015,400
Present Value of Future Member Contributions (PVFEEC)	<u>51,499,100</u>	<u>52,723,900</u>
Actuarial Liability (AL=PVB–PVFNC–PVFEEC)	\$ 355,638,100	\$ 389,498,000
Actuarial Value of Assets (AVA)	<u>331,534,300</u>	<u>363,496,500</u>
Net (Surplus)/Unfunded (AL – AVA)	\$ 24,103,800	\$ 26,001,500
<u>Present Value of Accrued Benefits</u>		
Present Value of Benefits (PVB)	\$ 501,945,800	\$ 539,237,300
Present Value of Future Benefit Accruals (PVFBA)	<u>236,591,600</u>	<u>243,156,700</u>
Present Value of Accrued Benefits (PVAB=PVB–PVFBA)	\$ 265,354,200	\$ 296,080,600
Market Value of Assets (MVA)	\$ 325,815,900	\$ 367,469,700
Net (Surplus)/Unfunded PVAB (PVAB – MVA)	\$ (60,461,700)	\$ (71,389,100)

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION III – LIABILITIES

Changes in Liabilities

Each of the liabilities disclosed in the prior table are expected to change at each valuation. The components of that change, depending upon which liability is analyzed, can include:

- New entrants since the last valuation
- Benefits accrued since the last valuation
- Plan amendments increasing benefits
- Passage of time which adds interest to the prior liability
- Benefits paid to retirees since the last valuation
- Participants retiring, terminating, or dying at rates different than expected
- A change in actuarial assumptions
- A change in actuarial methods

Unfunded liabilities (or surpluses), developed from subtraction of an appropriate value of plan assets from these liability measures, will change because of all of the above as well as due to changes in plan asset measures resulting from:

- Employer contributions different than expected
- Investment earnings different than expected
- A change in the methodology used to measure plan assets

In each valuation, we report on those elements of change that are of particular significance, potentially affecting the long-term financial outlook of the Plan. Below, we present key changes in the liabilities since the last valuation.

Table III-2 Liability Changes			
	Present Value of Benefits	Actuarial Liability	Present Value of Accrued Benefits
Liabilities June 30, 2017	\$ 501,945,800	\$ 355,638,100	\$ 265,354,200
Liabilities June 30, 2018	539,237,300	389,498,000	296,080,600
Liability Increase/(Decrease)	37,291,500	33,859,900	30,726,400
Change Due to:			
Benefit Changes	0	0	0
Assumption Changes	0	0	0
Actuarial (Gain)/Loss	NC *	(1,002,300)	NC *
Benefits Accumulated and Other (Gain)/Loss	37,291,500	34,862,200	30,726,400

* NC = not calculated

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION III – LIABILITIES

Table III-3 below provides additional information about the liability measurements for funding purposes as of both the current and the immediately prior valuations.

Table III-3 Actuarial Liabilities for Funding		
	June 30, 2017	June 30, 2018
1. Actuarial Liabilities		
Retiree, Beneficiary, Disabled, and Terminated Members	\$ 85,102,400	\$ 104,127,300
Active Members	<u>270,535,700</u>	<u>285,370,700</u>
Total Actuarial Liability (AL)	\$ 355,638,100	\$ 389,498,000
2. Actuarial Value of Assets (AVA)	\$ 331,534,300	\$ 363,496,500
3. Unfunded Actuarial Liability (UAL) [AL – AVA]	\$ 24,103,800	\$ 26,001,500
4. Unpaid UAL from Participating Municipalities	<u>51,000</u>	<u>0</u>
5. Net Base for 10-Year UAL Amortization (3-4)	\$ 24,052,800	\$ 26,001,500

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
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SECTION IV – CONTRIBUTIONS

In the process of evaluating the financial condition of any pension plan, the actuary analyzes the assets and liabilities to determine what level, if any, of contributions are needed to properly maintain the funding status of the plan. Typically, the actuarial process will use a funding technique that will result in a pattern of contributions that are both fairly stable and predictable.

For this Plan, the funding method employed is the **Entry Age Normal** actuarial funding method. Under this method, there are three components to the total contribution: the **normal cost contribution**, the **unfunded actuarial liability contribution** (UAL contribution), and the **administrative expense contribution**.

The employer normal cost contribution rate is determined in the following steps. First, for each active member an individual total normal cost rate is determined by taking the value, as of entry age into the Plan, of that member’s projected future benefits and dividing it by the value, also at entry age, of the member’s expected future salary. Then, this individual total normal cost rate is reduced by the member’s contribution rate to produce the employer normal cost rate for each member. The employer normal cost rate times payroll for each active member equals the employer normal cost. The sum of the employer normal cost amounts for all active members is then divided by the covered payroll for all active members to produce the employer normal cost contribution rate.

The actuarial liability is that portion of the present value of projected benefits that will not be paid by future employer normal cost contributions or future member contributions. The difference between this liability and the funds accumulated as of the same date is referred to as the unfunded actuarial liability (UAL).

The UAL amortization payment rate is calculated by amortizing this UAL, after subtracting payments due from municipalities paying for prior service, over an open 10-year period. All payments are determined assuming total pay increases by the current annual inflation assumption of 2.50%.

The current assumed administrative expense rate is 0.25% of payroll. This rate, when applied to payroll, is intended to provide an allowance above the cost of funding the benefits to pay for the expense of operating the Plan.

The table below presents and compares the employer contribution rates for the Plan based on this funding valuation and the immediately prior one.

Table IV-1 Employer Contribution Rate		
Valuation Date	June 30, 2017	June 30, 2018
FY Contribution Rate Payable	FY 2019	FY 2020
Employer Entry Age Normal Cost Rate	12.92%	12.91%
UAL Amortization Payment Rate	3.51%	3.68%
Administrative Expense Rate	<u>0.25%</u>	<u>0.25%</u>
Actuarially Determined Contributions	16.68%	16.84%

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
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SECTION IV – CONTRIBUTIONS

Table IV-2 below provides additional detail about the development of the actuarially determined contribution rate for participating employers as well as the expected dollar amounts these rates will result in for FY 2020.

Table IV-2 Expected FY 2020 Employer Contributions		
	In Dollars	As % of Payroll
1. Present Value of Projected Benefits Attributable to:		
a. Total Normal Cost	\$ 17,529,900	19.91%
b. Expected Member Contributions	<u>6,163,200</u>	<u>7.00%</u>
c. Employer Normal Cost (a) – (b)	\$ 11,366,700	12.91%
2. Amortization of Unfunded Liability	3,238,600	3.68%
3. Allowance for Administrative Expense	<u>220,100</u>	<u>0.25%</u>
4. Total Employer Actuarially Determined Contributions (1) + (2) + (3)	\$ 14,825,400	16.84%

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
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SECTION V – ACCOUNTING STATEMENT INFORMATION

ASC Topic No. 960 of the Financial Accounting Standards Board (FASB) requires plans subject to it to disclose certain information regarding their funded status. This Plan is not subject to this requirement, but this information is provided for informational purposes. Statement No. 67 of the Governmental Accounting Standards Board (GASB) establishes standards for disclosure of pension information by public employee retirement systems (PERS) and governmental employers in notes to financial statements and supplementary information.

Disclosures based on FASB ASC Topic No. 960 provide a quasi “snap shot” view of how the Plan’s assets compare to its liabilities if contributions stopped and accrued benefit claims had to be satisfied. However, due to potential legal requirements and the possibility that alternative interest rates would have to be used to determine the liabilities, these values may not be a good indication of the amount of money it would take to buy the benefits for all members if the Plan were to terminate and should not be considered a settlement value.

FASB ASC Topic No. 960 specifies that a comparison of the present value of accrued (accumulated) benefits, with the market value of the assets as of the valuation date, must be provided. Again, this Plan is not subject to this requirement, but the relevant amounts as of June 30, 2017 and June 30, 2018 are provided for informational purposes and are exhibited in Table V-1, which also includes a reconciliation of liabilities determined as of the prior valuation, July 1, 2017, to the liabilities as of June 30, 2018. These values are based on the funding liability results.

This valuation contains information reported in the June 30, 2018 Comprehensive Annual Financial Report (CAFR) of Delaware PERS under GASB Statement No. 67. Disclosures are based on the use of updated procedures to roll forward the 2017 funding valuation results. The calculation of Net Pension Liability in Table V-2 shows the amounts to be disclosed for FY 2018, based on the liabilities of the roll forward of the 2017 funding valuation, as well as a projection of the anticipated FY 2019 disclosures, based on liabilities from the 2018 funding valuation, assuming all actuarial assumptions are met over the coming year. The actual disclosures for FY 2019 will be developed once the asset measure for GASB as of June 30, 2019 is known.

Tables V-3 through V-5 are exhibits to be used for the System’s CAFR. Table V-3 is the Note to Required Supplementary Information, Table V-4 is a history of gains and losses in accrued liability, and Table V-5 is the Schedule of Funded Liabilities by Type, which shows the portion of accrued liability covered by the actuarial value of assets. The Government Finance Officers Association (GFOA) has named this exhibit the Schedule of Funded Liabilities by Type. None of the liabilities or assets shown are appropriate for settlement purposes. Furthermore, the Schedule of Funded Liabilities by Type does not accurately depict a plan’s future financial condition but rather is a test developed by the GFOA to assess the level of funding that relies on the payroll for future hires to pay for the benefits that have already been accrued by the current population. This valuation does not contain the additional disclosures required by GASB Statement No. 68 for the plan sponsor’s CAFR.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
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SECTION V – ACCOUNTING STATEMENT INFORMATION

**Table V-1
Accounting Statement Disclosure and
Reconciliation of Present Value of Accrued Benefits**

	June 30, 2017	June 30, 2018
FASB ASC Topic No. 960 Basis		
1. Present Value of Accrued Benefits (PVAB)		
a. Members Currently Receiving Payments	\$ 83,684,800	\$ 102,111,400
b. Former Vested Members	1,417,600	2,015,900
c. Active Members	<u>180,251,800</u>	<u>191,953,300</u>
2. Total PVAB [1(a) + 1(b) + 1(c)]	\$ 265,354,200	\$ 296,080,600
3. Market Value of Assets (MVA)	<u>325,815,900</u>	<u>367,469,700</u>
4. Unfunded PVAB [2 – 3]	\$ (60,461,700)	\$ (71,389,100)
5. Ratio of MVA to PVAB [3 / 2]	122.8%	124.1%
Reconciliation of PVAB		
PVAB at June 30, 2017		\$ 265,354,200
Increase/(Decrease) During Years Attributable to:		
Passage of Time		18,296,200
Benefits Paid – FY 2018		(7,958,900)
Benefit Changes		0
Assumption Changes		0
Benefits Accrued, Other Gains/Losses		<u>20,389,100</u>
Net Increase/(Decrease)		30,726,400
PVAB at June 30, 2018		\$ 296,080,600

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION V – ACCOUNTING STATEMENT INFORMATION

**Table V-2
GASB No. 67 Disclosures**

	June 30, 2018	Estimated June 30, 2019
<u>Total Pension Liability (TPL)</u>		
Service cost	\$ 17,010,000	\$ 17,530,000
Interest	25,811,000	28,160,000
Changes in benefit terms	0	0
Differences between expected and actual experience	19,690,000	(1,002,000)
Changes in assumptions	0	0
Benefit payments, including refunds of member contributions	(7,959,000)	(9,457,000)
Net change in TPL	\$ 54,552,000	\$ 35,237,000
TPL - beginning	\$ 335,948,000	\$ 390,500,000
TPL - ending (a)	\$ 390,500,000	\$ 425,738,000
<u>Fiduciary Net Position¹(FNP)</u>		
Contributions - Employer	\$ 9,484,000	\$ 14,686,000
Contributions - Non-employer	0	0
Contributions - Member	6,068,000	6,168,000
Net investment income	34,155,000	26,107,000
Benefit payments, including refunds of member contributions	(7,959,000)	(9,457,000)
Administrative expenses	(145,000)	(220,000)
Net change in FNP	\$ 41,604,000	\$ 37,284,000
FNP - beginning	\$ 325,867,000	\$ 367,470,000
FNP - ending (b)	\$ 367,470,000	\$ 404,754,000
Net Pension Liability/(Asset) - ending [(a)-(b)]	\$ 23,031,000	\$ 20,984,000

¹ Does not agree with the market value of assets for 2017 disclosed elsewhere in this report due to the treatment of receivable employer contribution.

Items printed in red will be replaced with actual amounts once known at the end of FY 2019.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION V – ACCOUNTING STATEMENT INFORMATION

**Table V-3
Note to Required Supplementary Information**

The June 30, 2018 total pension liability presented in Table V-4 was determined as part of the measurement at the date indicated. Additional information as of the latest measurement date follows:

Measurement date:	July 1, 2018
Valuation date:	July 1, 2017
Actuarial cost method	Entry age normal
Actuarial assumptions:	
Investment rate of return*	7.0%
Projected salary increases*	2.5% plus merit component based on service
Cost-of-living adjustments	ad hoc
* Includes inflation at	2.50%

The actuarially determined contribution for fiscal year 2020 will use the contribution rate developed in section IV of this valuation. It was determined using the measurement date and key assumptions that follow:

Measurement date:	July 1, 2018
Valuation date:	July 1, 2018
Actuarial cost method	Entry age normal
Amortization method	Percentage of pay – open Pay increases at 2.5% per year
Amortization period	10 years
Asset valuation method	Smoothed market, 20% annual market weight
Actuarial assumptions:	
Investment rate of return*	7.0%
Projected salary increases*	2.5% plus merit component based on service
Cost-of-living adjustments	ad hoc
* Includes inflation at	2.50%

The actuarial assumptions used have been recommended by the actuary and adopted by the Plan’s Board of Trustees based on the most recent review of the Plan’s experience completed in 2016. The economic assumptions were updated first effective with the 2017 valuation based on the Board’s annual review of these assumptions.

The total rate of State contributions to the Plan is composed of the employer normal cost rate, the unfunded actuarial liability amortization payment rate, and the administrative expenses rate. The employer normal cost rate is a level percent of payroll cost that, along with member contributions, will pay for projected benefits at retirement for each active member. The actuarial liability is that portion of the present value of projected benefits that will not be paid by future employer normal costs or future member contributions. The difference between this liability and the funds accumulated as of the same date is the unfunded actuarial liability. The allowance for administrative expenses is based upon the Plan’s actual administrative expenses.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

SECTION V – ACCOUNTING STATEMENT INFORMATION

**Table V-4
Analysis of Financial Experience
Gain and Loss in Accrued Liability during Years Ended June 30
Resulting from Differences between Assumed Experience and Actual Experience**

Type of Activity	<i>Gain (or Loss) for Year Ending June 30, (expressed in thousands)</i>					
	2013	2014	2015	2016	2017	2018
Investment Income on Actuarial Assets	\$ 163	\$ 4,184	\$ 675	\$ (4,237)	\$ (1,430)	\$ 993
Combined Liability Experience	<u>10,625</u>	<u>3,309</u>	<u>(1,731)</u>	<u>4,157</u>	<u>(19,690)</u>	<u>1,002</u>
(Loss)/Gain during Year from Financial Experience	\$ 10,788	\$ 7,493	\$ (1,056)	\$ (80)	\$ (21,120)	\$ 1,995
Non-Recurring Items	<u>(5,179)</u>	<u>(2,595)</u>	<u>319</u>	<u>252</u>	<u>(9,457)</u>	<u>0</u>
Composite Gain (or Loss) during Year	\$ 5,609	\$ 4,898	\$ (1,375)	\$ 172	\$ (30,577)	\$ 1,995

**Table V-5
Schedule of Funded Liabilities by Type
Aggregate Accrued Liabilities for
(expressed in thousands)**

Valuation Date June 30,	Active Member Contributions (1)	Retirees & Beneficiaries (2)	Active Member State-Financed Contributions (3)	Actuarial Value of Reported Assets	Portion of Accrued Liabilities Covered by Reported Assets		
					(1)	(2)	(3)
2018	\$ 67,901	\$ 102,111	\$ 219,486	\$ 363,497	100%	100%	88%
2017	63,747	83,685	208,206	331,534	100	100	88
2016	58,179	63,653	174,205	301,144	100	100	103
2015	53,346	49,405	166,818	270,256	100	100	100
2014	48,597	39,168	150,771	240,744	100	100	101
2013	42,945	31,217	133,578	203,832	100	100	97

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
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APPENDIX A – MEMBERSHIP INFORMATION

Delaware County & Municipal Police/Firefighters Pension Plan Data Reconciliation										
	A	P-TDV	P-SUPP	P-RET	P-DIS	P-NSR	P-SR	P-SRSU	P-SURV	Total
1. June 30, 2017 valuation	1,228	23	4	144	0	14	16	8	8	1,445
2. Additions										
(a) New entrants	87						1			88
(b) New Beneficiary/QDRO									3	3
(c) Total	87						1		3	91
3. Reductions										
(a) Terminated - not vested	(34)									(34)
(b) Paid Out/Expired/Death		(1)								(1)
(c) Total	(34)	(1)								(35)
4. Changes in status										
(a) P-TDV	(6)	6								
(b) P-SUPP										
(c) Returned to work	1	(1)								
(d) P-RET	(24)			24						
(e) PRET25										
(f) P-DIS										
(g) P-LTD										
(h) P-SURV										
(i) PSUR25										
(j) P-SR	(4)					(2)	6			
(k) Data corrections										
(l) Total	(33)	5		24		(2)	6			
5. June 30, 2018 valuation	1,248	27	4	168	0	12	23	8	11	1,501

A=Active, P-TDV=Terminated Deferred Vested, P-SUPP=Terminated Deferred Vested, P-RET=Retired, PRET25=Retired, P-DIS=Disabled, P-LTD=Long-Term Disabled, P-SURV=Surviving Beneficiary, PSUR25=Surviving Beneficiary, P-SR=Disabled

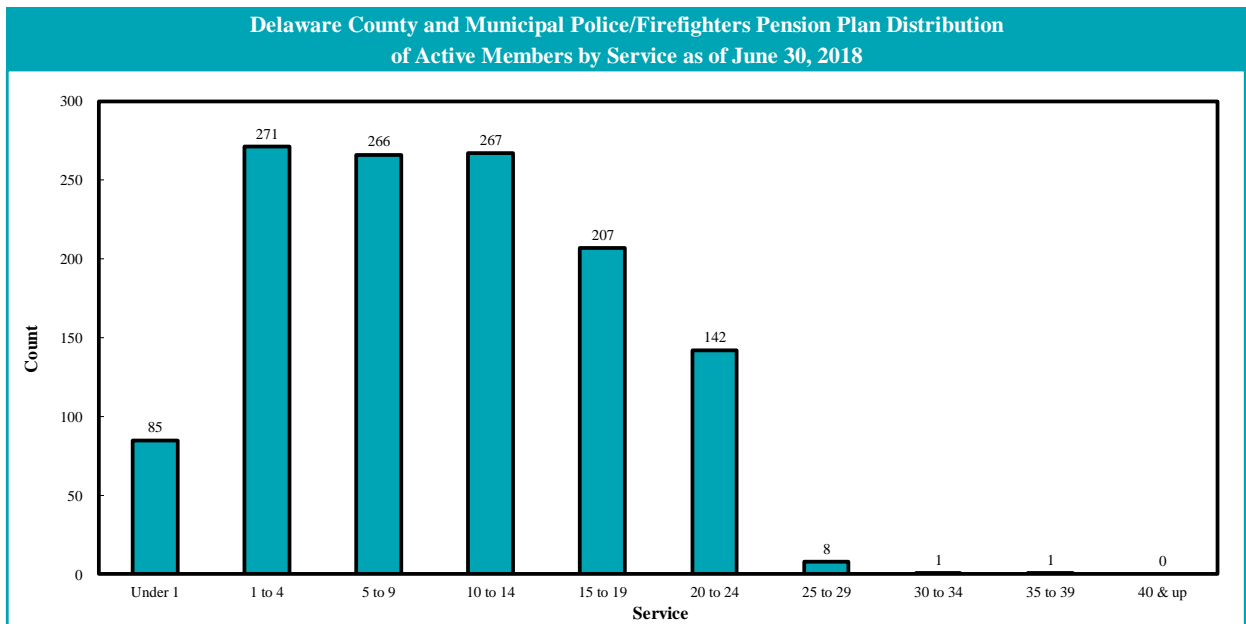
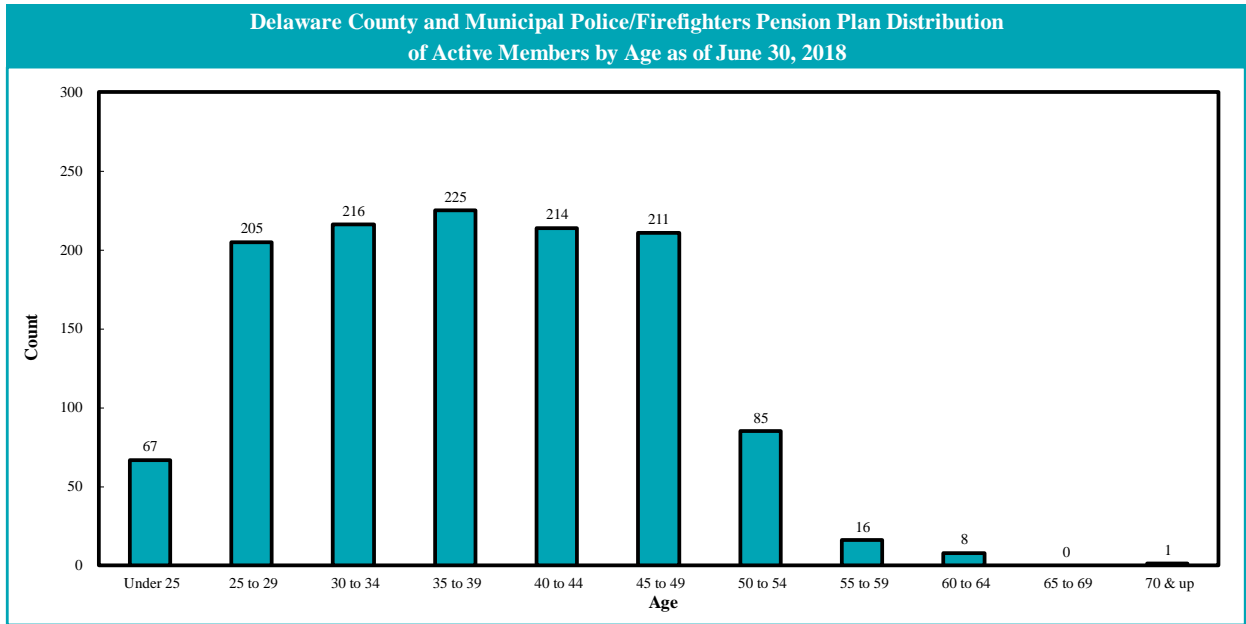
**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Delaware County and Municipal Police/Firefighters Pension Plan Distribution of Active Members by Age and Service as of June 30, 2018												
Counts By Age/Service												
Age	Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	35	32	0	0	0	0	0	0	0	0	0	67
25 to 29	34	125	46	0	0	0	0	0	0	0	0	205
30 to 34	13	65	106	32	0	0	0	0	0	0	0	216
35 to 39	1	25	66	112	21	0	0	0	0	0	0	225
40 to 44	1	11	29	66	89	18	0	0	0	0	0	214
45 to 49	0	5	14	39	70	81	2	0	0	0	0	211
50 to 54	0	3	5	12	23	37	5	0	0	0	0	85
55 to 59	1	4	0	2	3	5	1	0	0	0	0	16
60 to 64	0	1	0	4	1	1	0	0	0	1	0	8
65 to 69	0	0	0	0	0	0	0	0	0	0	0	0
70 & up	0	0	0	0	0	0	0	1	0	0	0	1
Total	85	271	266	267	207	142	8	1	1	1	0	1,248

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
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APPENDIX A – MEMBERSHIP INFORMATION



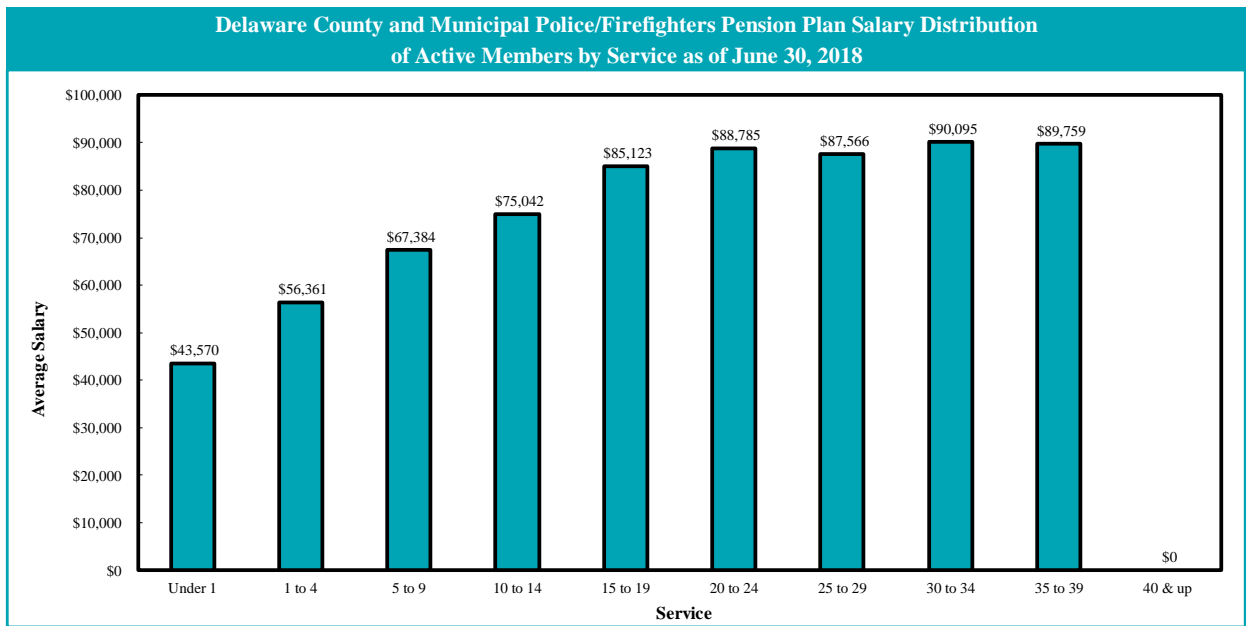
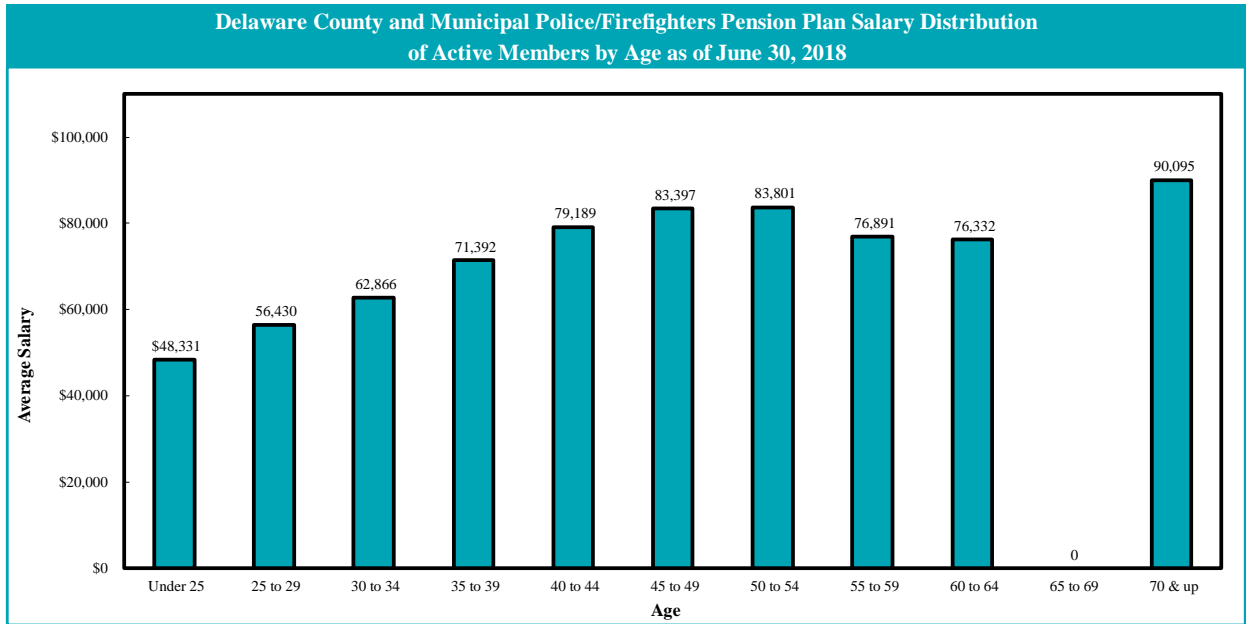
**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX A – MEMBERSHIP INFORMATION

Delaware County and Municipal Police/Firefighters Pension Plan Salary Distribution of Active Members by Age and Service as of June 30, 2018												
Average Salary by Age/Service												
Age	Service										Total	
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up		
Under 25	\$ 43,170	\$ 53,975	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 48,331
25 to 29	43,109	56,327	66,557	0	0	0	0	0	0	0	0	56,430
30 to 34	43,386	54,935	67,525	71,458	0	0	0	0	0	0	0	62,866
35 to 39	55,771	54,106	67,323	75,649	82,804	0	0	0	0	0	0	71,392
40 to 44	44,582	58,020	68,721	75,471	86,801	86,905	0	0	0	0	0	79,189
45 to 49	0	49,305	67,566	78,627	84,578	89,719	75,045	0	0	0	0	83,397
50 to 54	0	115,871	64,548	67,410	82,393	88,877	92,069	0	0	0	0	83,801
55 to 59	62,382	73,449	0	73,344	70,955	84,886	90,095	0	0	0	0	76,891
60 to 64	0	56,155	0	68,430	127,924	63,098	0	0	89,759	0	0	76,332
65 to 69	0	0	0	0	0	0	0	0	0	0	0	0
70 & up	0	0	0	0	0	0	0	90,095	0	0	0	90,095
Total	\$ 43,570	\$ 56,361	\$ 67,384	\$ 75,042	\$ 85,123	\$ 88,785	\$ 87,566	\$ 90,095	\$ 89,759	\$ 0	\$ 0	\$ 70,550

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIIGHTERS PENSION PLAN
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APPENDIX A – MEMBERSHIP INFORMATION



**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
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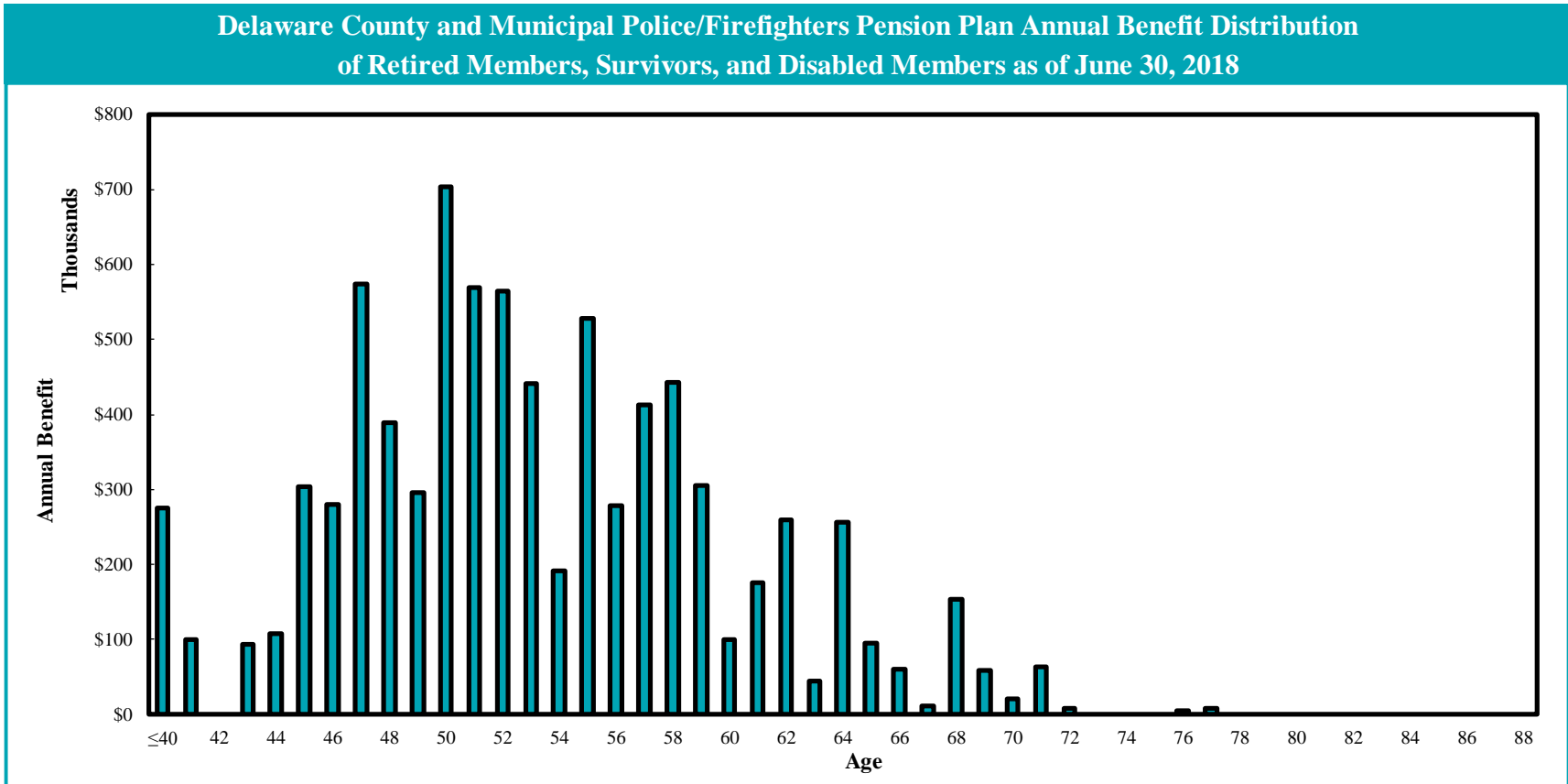
APPENDIX A – MEMBERSHIP INFORMATION

**Delaware County and Municipal Police/Firefighters Pension Plan Annual Benefit Distribution
of Retired Members, Survivors, and Disabled Members as of June 30, 2018**

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	8	\$138,633	73	0	\$0
25	0	\$0	74	0	\$0
26	0	\$0	75	0	\$0
27	0	\$0	76	1	\$5,437
28	0	\$0	77	1	\$8,023
29	0	\$0	78	0	\$0
30	0	\$0	79	0	\$0
31	0	\$0	80	0	\$0
32	1	\$5,709	81	0	\$0
33	0	\$0	82	0	\$0
34	0	\$0	83	0	\$0
35	0	\$0	84	0	\$0
36	1	\$38,274	85	0	\$0
37	0	\$0	86	0	\$0
38	0	\$0	87	0	\$0
39	2	\$62,300	88	0	\$0
40	1	\$29,527	89	0	\$0
41	3	\$99,448	90	0	\$0
42	0	\$0	91	0	\$0
43	3	\$92,949	92	0	\$0
44	3	\$107,833	93	0	\$0
45	7	\$303,116	94	0	\$0
46	7	\$280,592	95	0	\$0
47	15	\$573,106	96	0	\$0
48	9	\$389,571	97	0	\$0
49	7	\$296,127	98	0	\$0
50	18	\$702,896	99	0	\$0
51	14	\$569,565	100	0	\$0
52	13	\$563,928	101	0	\$0
53	11	\$440,765	102	0	\$0
54	5	\$190,910	103	0	\$0
55	13	\$528,144	104	0	\$0
56	8	\$278,273	105	0	\$0
57	9	\$411,994	106	0	\$0
58	11	\$442,782	107	0	\$0
59	6	\$305,489	108	0	\$0
60	3	\$100,329	109	0	\$0
61	5	\$174,948	110	0	\$0
62	6	\$258,951	111	0	\$0
63	1	\$44,094	112	0	\$0
64	8	\$255,513	113	0	\$0
65	5	\$95,517	114	0	\$0
66	4	\$60,204	115	0	\$0
67	1	\$10,483	116	0	\$0
68	3	\$153,009	117	0	\$0
69	3	\$58,370	118	0	\$0
70	2	\$21,148	119	0	\$0
71	3	\$63,505	120	0	\$0
72	1	\$7,641			
			Totals	222	\$8,169,103

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
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APPENDIX A – MEMBERSHIP INFORMATION



**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
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APPENDIX A – MEMBERSHIP INFORMATION

**Delaware County and Municipal Police/Firefighters Pension Plan Annual
Benefit Distribution of Vested Members as of June 30, 2018**

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	\$0	73	0	\$0
25	0	\$0	74	0	\$0
26	0	\$0	75	0	\$0
27	0	\$0	76	0	\$0
28	0	\$0	77	0	\$0
29	0	\$0	78	0	\$0
30	0	\$0	79	0	\$0
31	0	\$0	80	0	\$0
32	0	\$0	81	0	\$0
33	0	\$0	82	0	\$0
34	0	\$0	83	0	\$0
35	2	\$18,587	84	0	\$0
36	1	\$4,602	85	0	\$0
37	1	\$10,400	86	0	\$0
38	0	\$0	87	0	\$0
39	1	\$23,342	88	0	\$0
40	1	\$12,098	89	0	\$0
41	1	\$9,129	90	0	\$0
42	0	\$0	91	0	\$0
43	3	\$71,111	92	0	\$0
44	2	\$47,248	93	0	\$0
45	2	\$10,691	94	0	\$0
46	1	\$19,864	95	0	\$0
47	5	\$47,184	96	0	\$0
48	3	\$51,281	97	0	\$0
49	0	\$0	98	0	\$0
50	0	\$0	99	0	\$0
51	2	\$23,477	100	0	\$0
52	1	\$24,151	101	0	\$0
53	2	\$22,695	102	0	\$0
54	2	\$45,515	103	0	\$0
55	1	\$187	104	0	\$0
56	0	\$0	105	0	\$0
57	0	\$0	106	0	\$0
58	0	\$0	107	0	\$0
59	0	\$0	108	0	\$0
60	0	\$0	109	0	\$0
61	0	\$0	110	0	\$0
62	0	\$0	111	0	\$0
63	0	\$0	112	0	\$0
64	0	\$0	113	0	\$0
65	0	\$0	114	0	\$0
66	0	\$0	115	0	\$0
67	0	\$0	116	0	\$0
68	0	\$0	117	0	\$0
69	0	\$0	118	0	\$0
70	0	\$0	119	0	\$0
71	0	\$0	120	0	\$0
72	0	\$0			
			Totals	31	\$441,561

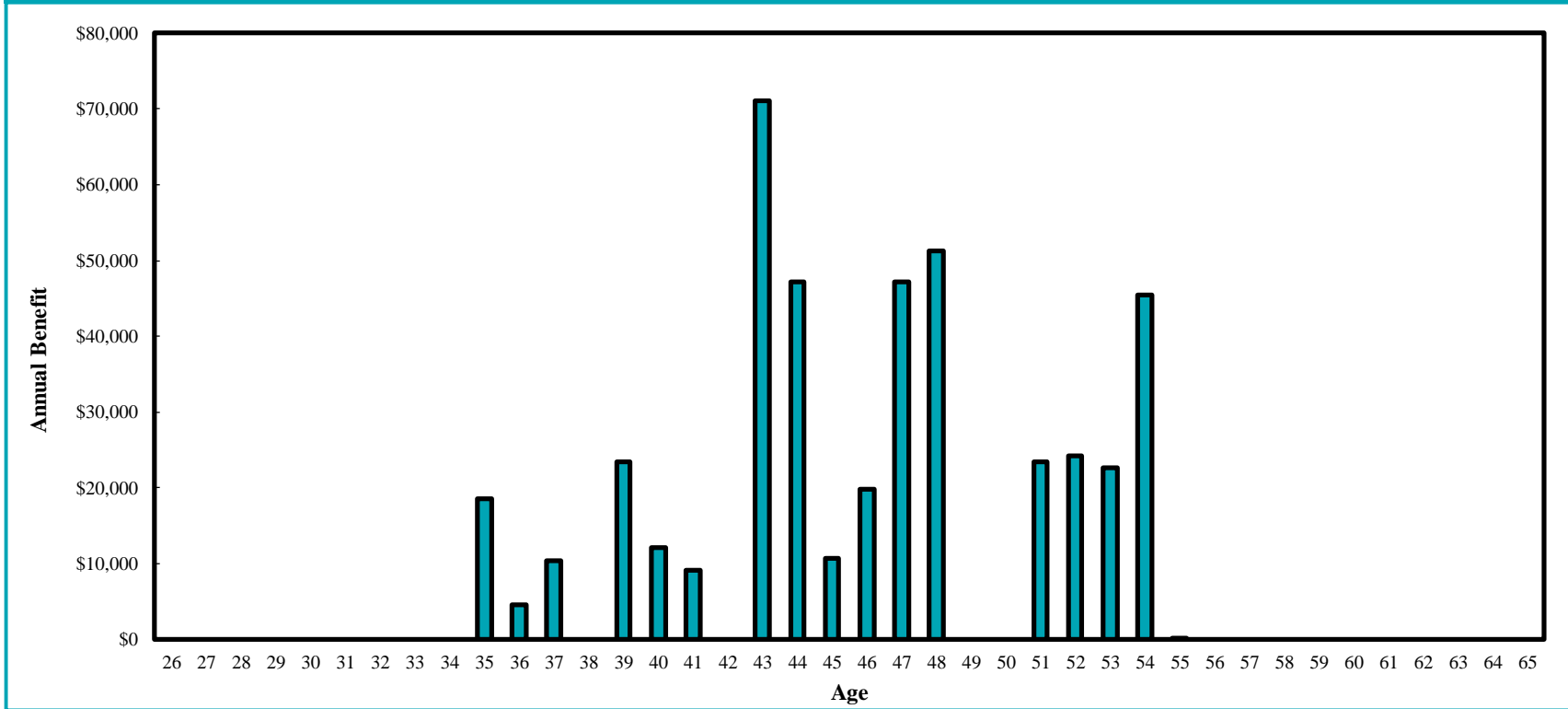
Amounts shown are those payable once the participant reaches retirement eligibility.



DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018

APPENDIX A – MEMBERSHIP INFORMATION

Delaware County and Municipal Police/Firefighters Pension Plan Annual
Benefit Distribution of Vested Members as of June 30, 2018



Amounts shown are those payable once the participant reaches retirement eligibility.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

A. Long-Term Assumptions Used to Determine Plan Costs and Liabilities

1. Demographic Assumptions

a. Rates of Mortality

Mortality rates are based on the sex-distinct employee, healthy annuitant, and disabled annuitant mortality tables described below, including adjustment factors applied to the published tables for each group. Future mortality improvements are reflected by applying a custom projection scale on a generational basis to adjusted base tables from the base year shown below.

i. Sample Rates of Mortality for Active Healthy Lives at Selected Ages (number of deaths per 10,000 members):

(2018 Values Shown)		
Age	Male	Female
25	5	2
30	5	2
35	5	3
40	6	4
45	10	6
50	18	10
55	30	16
60	50	24
65	88	36
70	150	63
75	256	108
80	432	187

Rates are based on 110% and 100% of the RP-2014 Total Dataset Employee Mortality Table, respectively, for males and females, using the RP-2014 Total Dataset Healthy Annuitant Mortality Table rates after the end of the Employee Mortality Table, both projected from the 2006 base rates using the RPEC-2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0% for ages 115-120, and convergence to the ultimate rate in the year 2020. The valuation uses fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

**ii. Sample Rates of Mortality for Healthy Annuitant Lives at Selected Ages
(number of deaths per 10,000 members):**

(2018 Values Shown)		
Age	Male	Female
50	43	26
55	61	36
60	83	52
65	117	79
70	182	128
75	296	209
80	498	354
85	869	628
90	1,537	1,126
95	2,434	1,859
100	3,486	2,785

Rates are based on 110% and 100% of the RP-2014 Total Dataset Healthy Annuitant Mortality Table, respectively, for males and females, using the RP 2014 Total Dataset Employee Mortality Table for ages prior to start of the Healthy Annuitant Mortality Table, both projected from the 2006 base rates using the RPEC-2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0% for ages 115-120, and convergence to the ultimate rate in the year 2020. The valuation uses fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

**iii. Sample Rates of Mortality for Disabled Annuitant Lives at Selected Ages
(number of deaths per 10,000 members):**

(2018 Values Shown)		
Age	Male	Female
25	91	27
30	87	34
35	103	48
40	124	66
45	192	103
50	235	136
55	271	171
60	308	203
65	369	247
70	477	336
75	653	492
80	931	743
85	1,387	1,126
90	2,135	1,673
95	3,003	2,440
100	3,957	3,432

Rates are based on 120% of the RP-2014 Total Dataset Disabled Annuitant Mortality Table, projected from the 2006 base rates using the RPEC-2015 model, with an ultimate rate of 0.85% for ages 20-85, grading down to an ultimate rate of 0% for ages 115-120, and convergence to the ultimate rate in the year 2020. The valuation uses fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

b. Sample Rates of Active Disability

Rates of Active Disability	
Age	Rate
20	0.0179%
25	0.0179
30	0.0710
35	0.0997
40	0.3882
45	0.7807
50	1.0969
55	1.5000

No disability assumed once member reaches retirement eligibility or age 56.

1/3 of disabilities are assumed to be partial and 2/3 are assumed to be total.

1/3 of disabilities are assumed to be duty-related and 2/3 are assumed to be non-duty related.

c. Termination of Employment Rates (Prior to Retirement Eligibility)

Service	Rate
0	7.10%
1	6.70
2	5.40
3	4.70
4	5.90
5	4.20
6	2.80
7	2.50
8	2.30
9	1.90
10+	1.20

* Termination rates zero once member has reached retirement eligibility, regardless of service.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

d. Rates of Retirement

Normal Retirement: one-year Select & Ultimate rates upon attaining the earliest of:

- i. Completion of 20 years of credited service, or
- ii. Attainment of age 62 with 10 years of credited service, or
- iii. When age plus service equals or exceeds 75 with a minimum of 10 years of credited service.

Age	Retirement	
	Select	Ultimate
<37	17.00%	0.00%
37-49	17.00	11.00
50-54	17.00	13.50
55-59	17.00	75.00
60+	17.00	100.00

e. Salary Increase Rates

Service-based table includes an annual inflation rate of 2.50%.

Service	Increase
0	9.50%
1	8.00
2	7.00
3	6.25
4	5.50
5	5.00
6	4.50
7	4.30
8	4.00
9	3.75
10+	3.50

f. Family Composition

Female spouses are assumed to be three years younger than males. 80% are assumed married for both male and female employees. Actual marital characteristics are used for pensioners.

**DELAWARE COUNTY & MUNICIPAL POLICE/FIREFIGHTERS PENSION PLAN
ACTUARIAL VALUATION AS OF JUNE 30, 2018**

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

2. Economic Assumptions

a. Investment Rate of Return:	7.00%
b. General Wage Increase Rate:	2.50%
c. Annual Assumed Cost-of-Living Increase Rate for Retirees:	0.00%
d. Total Payroll Increase Rate (for Amortization):	2.50%
e. Administrative Expenses as a Percentage of Covered Payroll:	0.25%

3. Rationale for Assumptions

The assumptions were adopted by the Board of Trustees upon the recommendation of the actuary, based on an experience study review performed in 2016 and covering the period July 1, 2010 through June 30, 2015. The Board continually reviews the investment rate of return assumption and adopted a reduced rate of 7.0% at the advice of its investment consultants, first effective for funding with the 2017 valuation.

4. Changes since Last Valuation

None.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

B. Actuarial Methods

1. Funding Method

The Entry Age Normal funding method is used to determine costs. Under this funding method, a normal cost rate is determined as a level percent of pay for each active member. The normal cost rate times payroll equals the normal cost for each active member. The normal cost plus member contributions will pay for projected benefits at retirement for each active plan participant.

The actuarial liability is that portion of the present value of projected benefits that will not be paid by future employer normal costs or member contributions. The difference between this liability and funds accumulated as of the same date is referred to as the unfunded actuarial liability.

The portion of the actuarial liability in excess of plan assets is amortized to develop an additional cost or savings that is added to each year's employer normal cost. Under this cost method, actuarial gains and losses are directly reflected in the size of the unfunded actuarial liability.

The portion of unfunded liability, after subtracting payments due from municipalities paying for prior service, is amortized over a rolling 10-year period as a percentage of payroll. All payments are determined assuming total payroll increases by the annual inflation rate. Use of a rolling amortization period means that the UAL amount is never anticipated to be fully paid off. This method was chosen to provide a more level contribution rate over time.

2. Actuarial Value of Assets

For purposes of determining the employer contribution rate to the Plan, we use an actuarial value of assets. This asset smoothing method dampens the volatility in asset values that could occur because of fluctuations in market conditions. Use of an asset smoothing method is consistent with the long-term nature of the actuarial valuation process.

The actuarial value of assets is a weighted average giving 20% weight to the current market value and 80% weight to the prior year's actuarial value increased by expected interest and contributions and decreased by benefit payments and expenses. This is mathematically equivalent to recognizing 100% of the actuarially assumed interest rate, plus contributions, less payment each year, and 20% of the portion of each year's returns that have not already been reflected in asset values.

3. Changes since Last Valuation

None.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

This appendix provides a summary of the plan provisions. Where the Plan, as determined by the State Code and the Plan Rules and Regulations, and this summary differ, the Plan governs.

1. Membership

The Plan covers an individual who is employed on a full-time basis as a police officer by a county or municipality in Delaware, an individual who is employed on a full-time basis as a uniformed firefighter by the City of Wilmington, or an individual employed on a full-time basis as a uniformed paramedic by a county in Delaware.

2. Member Contributions

7% of compensation

Interest is credited at the rate of 5% per year

Member contributions are made through an “employer pick-up” arrangement, which results in deferral of taxes on the contributions.

3. Credited Service

All service as a member plus certain claimed and purchased service.

4. Final Average Compensation

Final average compensation (FAC) is the average over the highest 36 consecutive months (or shorter period of total service).

5. Normal Retirement

Eligibility: (i) age 62 with five years of credited service, or (ii) any age with 20 years of credited service, or (iii) 10 years of credited service when age plus service equals 75

Benefit: 2.5% of final average compensation for each year of credited service, up to 20 years, plus 3.5% of final average compensation for each year of credited service over 20 years

6. Duty-Connected Disability Benefit

Eligibility: Disabled in the performance of his or her duties

Benefit: If member is totally disabled: 75% of final average compensation at the time disability commenced plus 10% for each eligible dependent not to exceed 100%

APPENDIX C – SUMMARY OF PLAN PROVISIONS

If member is partially disabled: the normal retirement benefit based on credited service at date of disability that is not less than 50% of final average compensation at the time disability commences

7. Ordinary Disability

Eligibility: Five years of credited service

Benefit: If member is totally disabled: the normal retirement benefit based on credited service at date of disability that is not less than 50% of the final average compensation at the time of disability plus 5% for each eligible dependent to a maximum of 70%

If member is partially disabled: the normal retirement benefit based on credited service at the date of disability that is not less than 30% of final average compensation at the time of retirement

8. Survivor's Benefit

Eligibility: Death while active

Benefit: For eligible survivors of employees who die in active service: 50% of salary, payable to the primary survivor

Eligible survivors include: (1) widow or widower, or (2) child or children under 18, or between 18 and 22 and attending school on a full-time basis, or over 18 and permanently disabled before 18, or (3) dependent parent or parents

9. Vesting

Eligibility: Five years of credited service

Benefit: Normal retirement benefit payable at age 62 based on final average compensation and service at date of termination. In lieu of a pension, a member may receive a refund of accumulated contributions with interest. Upon application for a refund of contributions, a member's vested right to a monthly benefit shall be forfeited.

10. Withdrawal

Eligibility: Terminated service

Benefit: Accumulated employee contributions with interest

APPENDIX C – SUMMARY OF PLAN PROVISIONS

11. Form of Payment

The normal form of payment is a 50% joint and survivor annuity.

As an alternative to the normal form, a member may elect one of the following optional forms of payment upon service retirement or disability:

- 66 2/3% joint and survivor form with a 2% reduction in benefits,
- 75% joint and survivor form with a 3% reduction in benefits, or
- 100% joint and survivor form with a 6% reduction in benefits.

The 66 2/3% and 100% options are only available for retirement on or after January 1, 2015.

12. Cost-of-Living Adjustments

Cost-of-living adjustments are made only on an ad hoc basis.

13. Changes since Last Valuation

None



Classic Values, Innovative Advice