Classic Values, Innovative Advice

Delaware State Employees' Pension Plan

Actuarial Valuation as of June 30, 2017

Produced by Cheiron

January 2018

www.cheiron.us 1.877.CHEIRON (243.4766)

TABLE OF CONTENTS

January 29, 2018

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 State Employees' Pension Plan (Plan) as of June 30, 2017. 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 State contribution levels and 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 State contribution for Fiscal Year (FY) 2019 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 State Employees' 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

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

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

FOREWORD

Cheiron has performed the annual actuarial valuation of the Delaware State Employees' Pension Plan (Plan) as of June 30, 2017. 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 State for Fiscal Year (FY) 2019, and

4) **Provide** 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 2019 actuarially determined contribution.

Section V includes 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 would vary from our results.

SECTION I – BOARD SUMMARY

General Comments

The actuarially determined contribution (ADC) rate was calculated to increase from 10.42% for FY 2018 to 11.83% for FY 2019.

During the year ended June 30, 2017, the Plan's assets earned 11.0% on a market value basis. However, due to the Plan's asset smoothing method, which recognizes portions of investment gains and losses over time, the return on an actuarial value basis was 6.7%. This return was less than the assumed investment rate of return of 7.2% for last year, resulting in an actuarial loss on investments of $44 million.

The Plan experienced an actuarial loss 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 loss increased the actuarial liability by $65 million, 0.7% of the total actuarial liability. This type of relatively small gain or loss is normal in the course of plan experience, as we cannot predict exactly how people will behave. In addition to the actuarial loss, the Plan's liabilities also increased by $212 million due to a reduction in the assumed investment rate of return.

During the plan year, the liabilities were also increased by $4.8 million due to a plan change extending the special Correctional Officers provisions of the Plan to additional members. These changes also include an additional two percent of salary in excess of $6,000 being contributed by the members as an offset to their increased benefits.

This valuation report also contains information to be reported in the June 30, 2017 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 updated procedures to roll forward the 2016 Actuarial Valuation liability results. The calculation of net pension liability in Section V is shown as disclosed for the plan year ending June 30, 2017, based on the 2016 funding actuarial valuation liability results, updated to reflect the reduction in the assumed investment rate of return. We also present a projection of the June 30, 2018 disclosure in Section V, assuming all actuarial assumptions are met over the coming year, which is based on the 2017 funding actuarial valuation liability results.

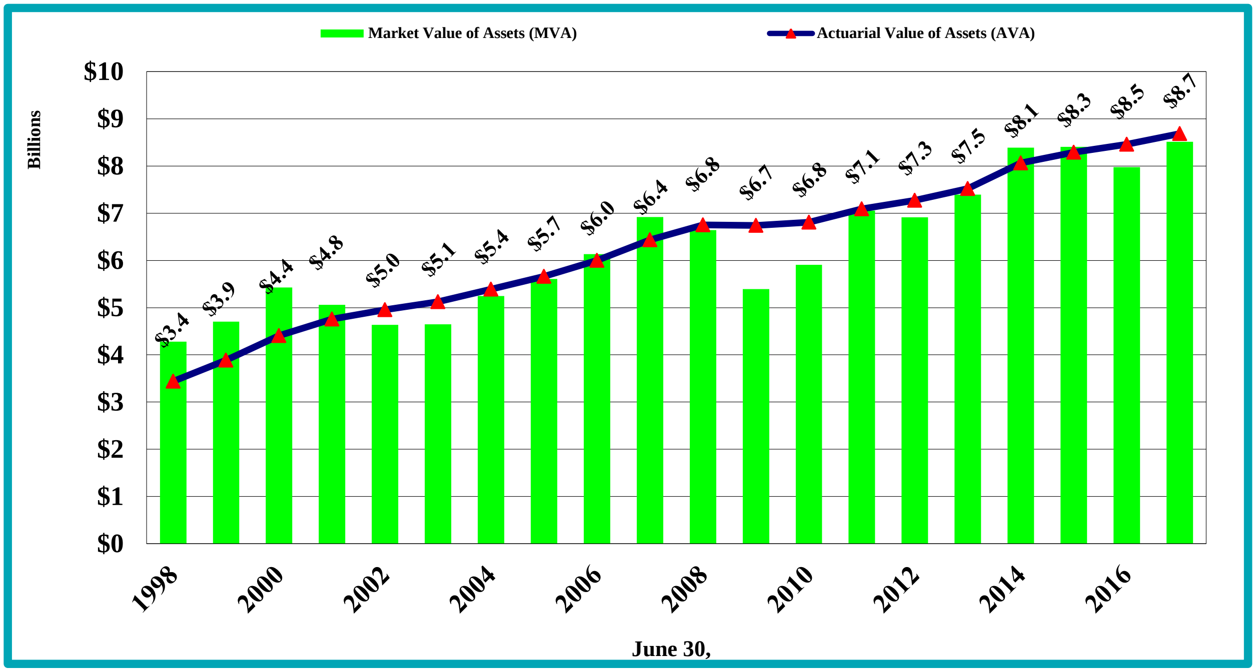
As of the June 30, 2017 funding actuarial valuation, the Plan's unfunded actuarial liability (UAL) was $1.356 billion. This is an increase from the $1.044 billion UAL in the funding valuation for the prior year.

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 actuarial value measurements. The black numbers are the actuarial value of asset measurements as of the valuation date for each year in billions of dollars.



The market value of assets (MVA) returned 11.0% 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 7.2% assumed for the prior year, and continued recognition of prior years' gains and losses, and thus returned 6.7% over FY 2017.

Over the period July 1, 1998 to June 30, 2017, the Plan's assets measured using the actuarial value or asset measurements returned a compound 8.0%, compared to the current valuation assumption of 7.0%. On a market value of assets basis, the Plan returned 6.8% over the same period.

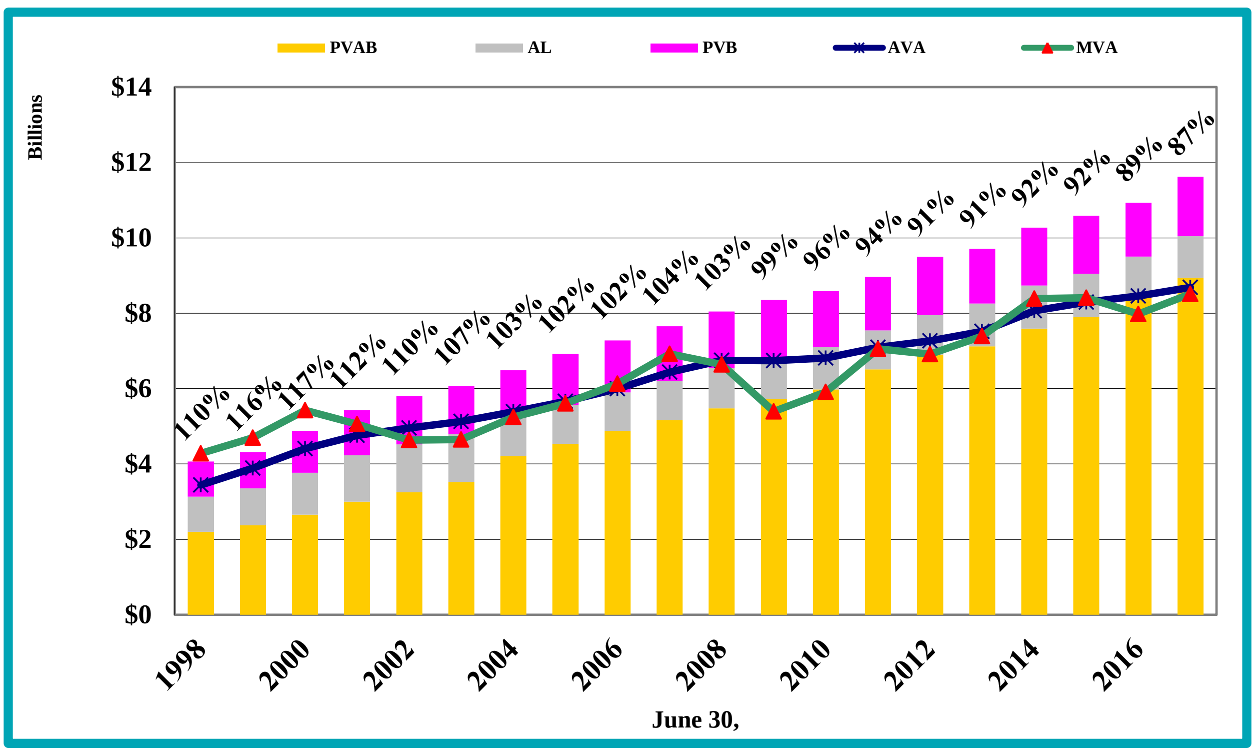
SECTION I – BOARD SUMMARY

Assets and Liabilities

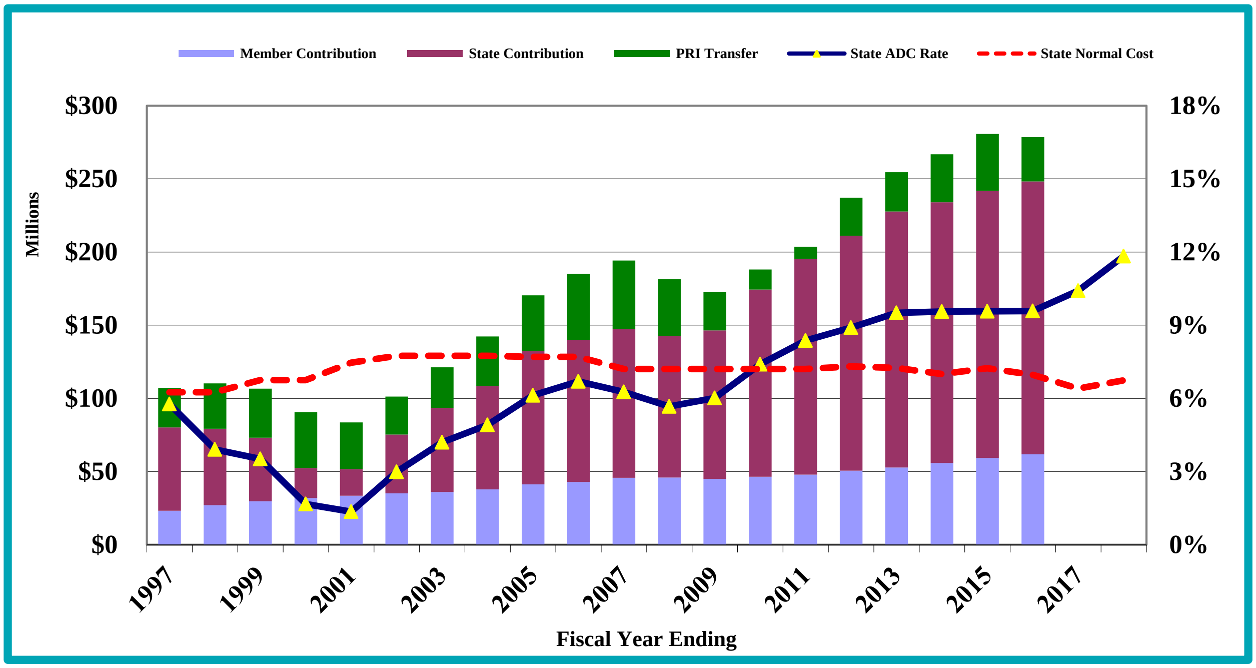
The three colored bars below represent the three different measures of liability discussed in this report. The first measure is given by the yellow bars, the present value of accrued benefits (PVAB). The PVAB values represent the value of all benefits earned by current members through the valuation date.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

The second liability measure 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 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.



Contribution Rates



The stacked bars in the graph above show the dollar amounts of the contributions made by the State, the Post-Retirement Increase Fund (PRI), and the members for each fiscal year and are read using the left-hand scale. The blue line shows the State ADC rate for each fiscal year as a percentage of payroll (right-hand scale). The red line shows the level of the State normal cost rate, which measures the value of benefits being accrued each year, offset by the portion paid through member contributions, also read with the right-hand scale.

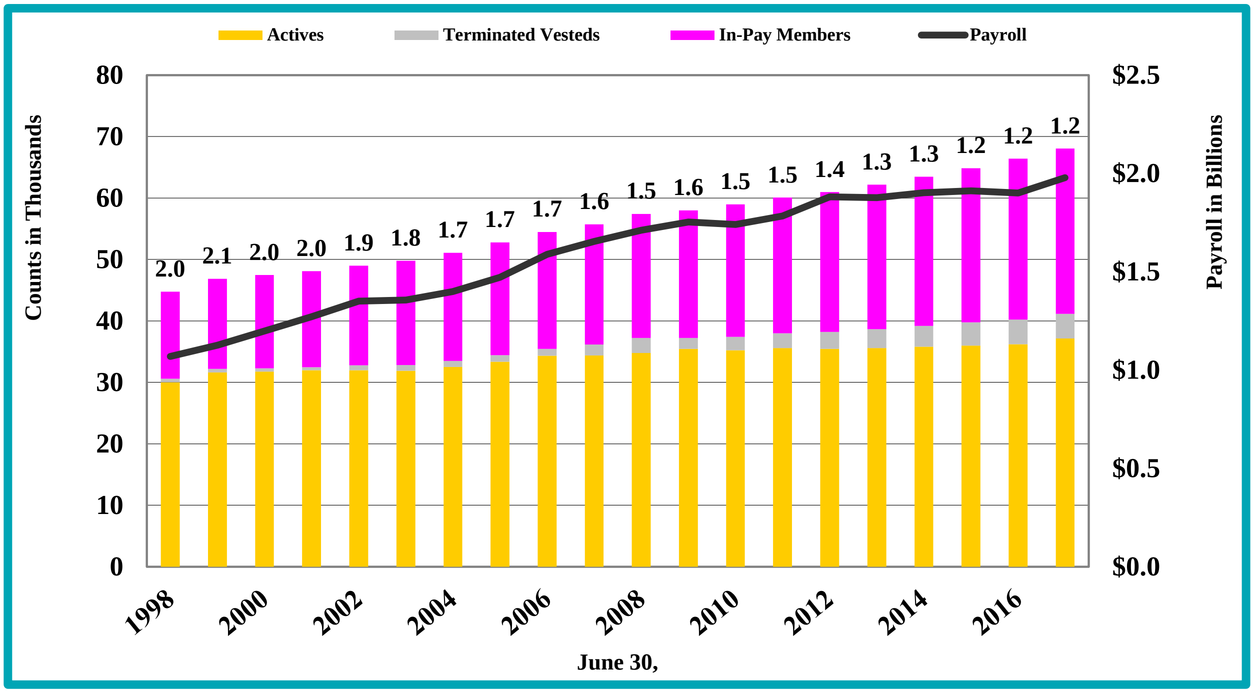
The member contribution rate is set by State law, based on the Plan in which the member participates. The State contribution rate is set by the actuarial process, while the PRI transfer amounts depend on the increases granted by the State Legislature. Please note that there is a lag in the State contribution rates shown. For example, the value shown for the FY 2017 is the rate prepared by the June 30, 2015 valuation and implemented for the period July 1, 2016 to June 30, 2017.

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. As with most maturing plans, this Plan continues 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. This active-to-inactive ratio has decreased from 2.0 actives to each inactive in 1998 to 1.2 actives for each inactive in 2017.

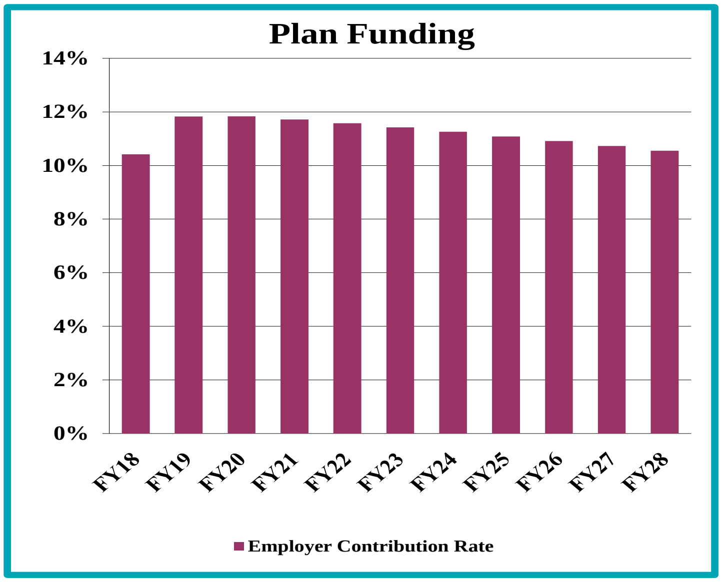
The black line shows the covered payroll for the Plan as of each valuation date and is read using the right-hand scale.



SECTION I – BOARD SUMMARY

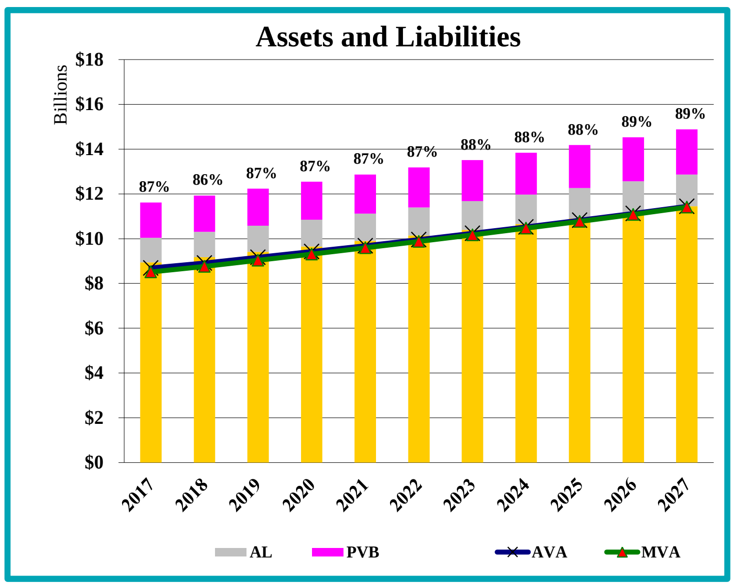
Future Outlook

Baseline Projections



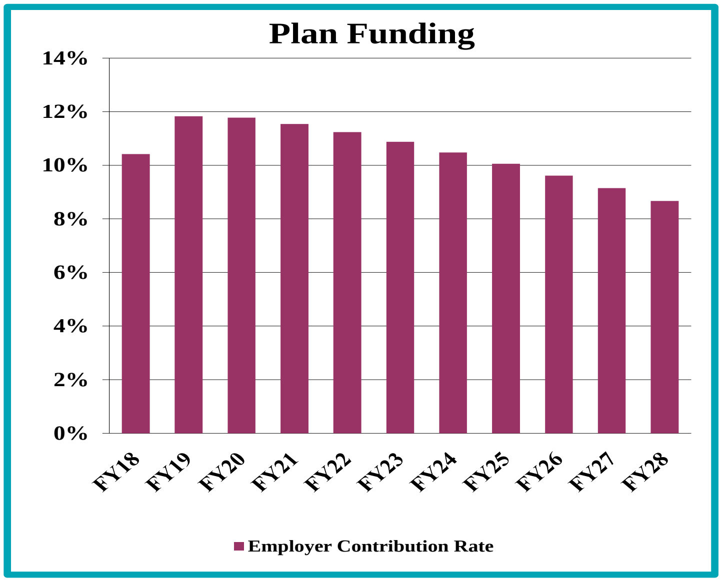
These graphs show the expected progress of the Plan over the next 10 years, assuming the Plan's assets earn 7.0% on a *market value* basis and assuming all other assumptions are exactly met, including that the actuarially determined contribution (ADC) amounts are made in full. The chart entitled "Plan Funding" shows a decrease in the State ADC rate from 11.83% in FY 2019, determined by the current valuation, to 10.55% at the end of this period, absent further gains or losses.

The "Assets and Liabilities" graph shows the projected funded ratios of the Plan over the next 10 years. The Plan's funded status is projected to decrease from 87% to 86% and then begin increasing again, to 89% at the end of the 10-year period, assuming all assumptions are exactly met.



SECTION I – BOARD SUMMARY

Projections with Asset Returns of 8.0%

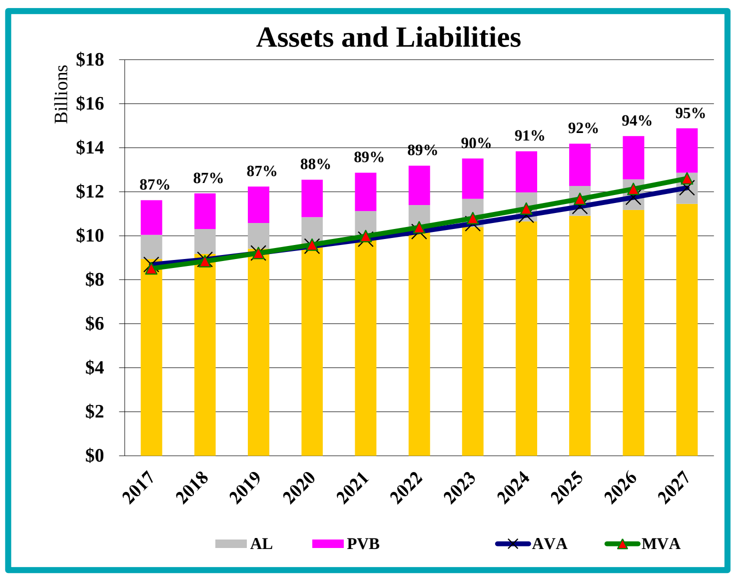


The Plan's investment earnings will affect the future funding status of the Plan. The two graphs on this page show what the next 10 years would be expected to look like if the Plan's investment performance is 8.0% each year, 1.0% higher than the valuation investment rate of return assumption.

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

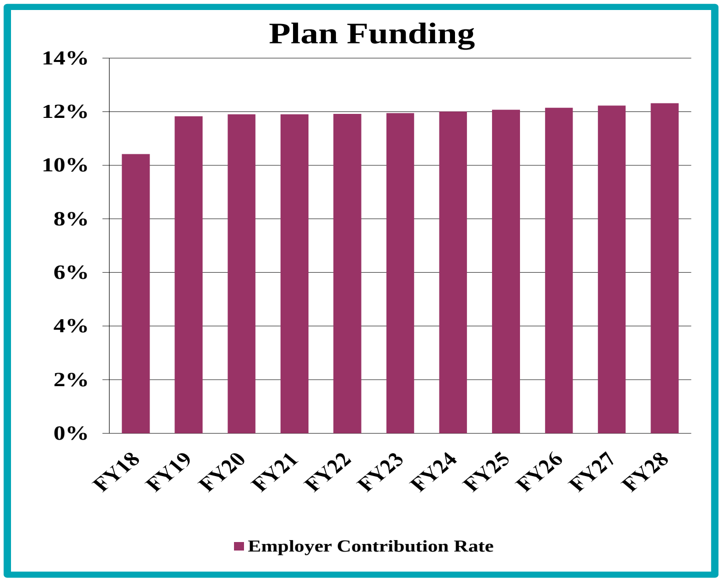
The "Plan Funding" graph shows that under this scenario the State ADC rate would decrease immediately after the FY 2019 rate determined by this valuation, as the investment gains offset any stored investment losses recognized by the asset smoothing method.

The "Assets and Liabilities" graph shows that under this scenario the Plan would stay around the same funded ratio for the next five years and then begin to increase, reaching a 95% funded ratio by 2027, an improvement over the baseline scenario's ultimate level of 89%.



SECTION I – BOARD SUMMARY

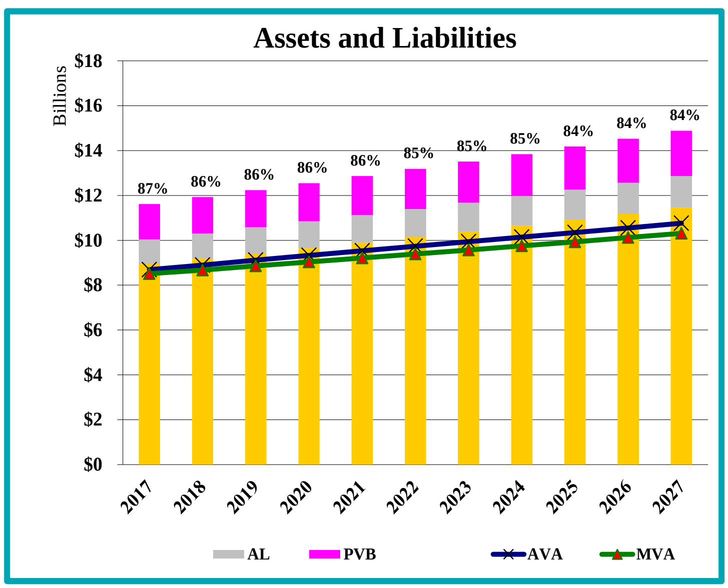
Projections with Asset Returns of 6.0%



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 State contributions equal to the full actuarially determined contribution.

Under this scenario, the State's ADC rate increases to approximately 12.3% of payroll by the end of the 10-year period, significantly greater than the 10.6% ultimate rate in the baseline projection. Additionally, the funded ratio is projected to drop in this scenario, reaching 84% at the end of the 10-year period, significantly lower than the 89% ultimate ratio in the baseline scenario.



SECTION I – BOARD SUMMARY

Table I-1
Summary of Principal Plan Results

Valuation as of:	**June 30, 2016**	**June 30, 2017**	**% Change**
Member Counts			
Active Members	36,198	37,119	2.54%
Disabled Members	1,646	1,583	(3.83%)
Retirees and Beneficiaries	24,533	25,296	3.11%
Terminated Vested Members	3,374	3,470	2.85%
Terminated Non-Vested Members	906	869	(4.08%)
Long-term Disability Members	647	573	(11.44%)
Total Member Counts	**67,304**	**68,910**	**2.39%**
Covered Payroll of Active Members*	$ 1,900,763,600	$ 1,979,138,300	4.12%
Annual Benefit Payments for Retirees, Disabled Members, and Beneficiaries	$ 571,723,500	$ 594,894,600	4.05%
Assets and Liabilities			
Actuarial Liability (AL)	$ 9,504,791,500	$ 10,044,583,200	5.68%
Actuarial Value of Assets (AVA)	8,460,614,400	8,688,641,300	2.70%
Unfunded AL (UAL)	$ 1,044,177,100	$ 1,355,941,900	29.86%
Funded Ratio AVA Basis (AVA/AL)	89.0%	86.5%	
Funded Ratio on MVA Basis (MVA/AL)	83.9%	84.8%	
Present Value of Accrued Benefits (PVAB)	$ 8,464,286,300	$ 8,938,613,700	5.60%
Market Value of Assets (MVA)	7,977,541,200	8,513,828,800	6.72%
Unfunded PVAB	$ 486,745,100	$ 424,784,900	(12.73%)
Accrued Benefit Funded Ratio (MVA/PVAB)	94.2%	95.2%	
State Contribution Rate	**Fiscal Year 2018**	**Fiscal Year 2019**	
Entry Age Normal Cost	6.10%	6.44%	
UAL Amortization Payment	4.02%	5.09%	
Administrative Expense	0.30%	0.30%	
Actuarially Determined Contribution (ADC)	10.42%	11.83%	

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

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, State 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, 2016 and June 30, 2017,
- Statement of the **changes** in market values during FY 2017,
- 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, 2016 and June 30, 2017, along with the changes between the two.

Table II-1
Changes in Market Value of Assets

Market Value of Assets – June 30, 2016		**$ 7,977,541,200**
Additions		
Member Contributions	$ 61,685,600	
State Contributions	186,625,300	
PRI Transfers	30,301,800	
Investment Returns	861,996,300	
Total Additions	**$ 1,140,609,000**	
Deductions		
Benefit Payments	$ 598,685,600	
Administrative Expenses	5,635,800	
Total Deductions	**$ 604,321,400**	
Market Value of Assets – June 30, 2017		**$ 8,513,828,800**

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, 2017.

Table II-2
Development of Actuarial Value of Assets

1.	Actuarial Value of Assets at June 30, 2016	$ 8,460,614,400
2.	Amount in (1) with interest to June 30, 2017 at 7.20% per year	9,069,778,600
3.	State, PRI, and member contributions for FY 2017	278,612,700
4.	Interest on contributions assuming payments made uniformly throughout the year to June 30, 2017 at 7.20% per year	10,030,100
5.	Disbursements from Trust except investment expenses, June 30, 2016 through June 30, 2017	604,321,400
6.	Interest on disbursements to June 30, 2017 at 7.20% per year	21,755,600
7.	Expected Actuarial Value of Assets at June 30, 2017 = (2) + (3) + (4) – (5) – (6)	$ 8,732,344,400
8.	Actual Market Value of Assets at June 30, 2017	$ 8,513,828,800
9.	Excess of (8) over (7)	$ (218,515,600)
10.	Actuarial Value of Assets at June 30, 2017 = (7) + 20% of (9)	$ 8,688,641,300

Investment Performance

The market value of assets (MVA) returned 11.0% during 2017, which is more than the prior year's assumed 7.2% investment rate of return. The actuarial value of assets (AVA) returned 6.7% over this same year, reflecting the asset smoothing method 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 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*
2017	$ 616,684,000	$ 286,837,000
2018	636,707,000	322,694,000
2019	656,858,000	319,177,000
2020	677,246,000	327,157,000
2021	697,496,000	335,336,000
2022	716,358,000	343,719,000
2023	735,721,000	352,312,000
2024	754,846,000	361,120,000
2025	773,981,000	370,148,000
2026	793,603,000	379,402,000

* Expected contributions include State contributions, member contributions, and PRI transfers. For illustration purposes, we have assumed the State contribution rate will remain at 11.83% from FYE 2019 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, 2017. 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, 2016 and June 30, 2017, 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 State 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 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.

SECTION III – LIABILITIES

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

	June 30, 2016	June 30, 2017
Present Value of Benefits		
Active Member Benefits	$ 5,077,089,900	$ 5,479,206,700
Retiree, Beneficiary, Disabled, and Terminated Members Benefits	5,851,217,400	6,139,438,300
Present Value of Benefits (PVB)	**$ 10,928,307,300**	**$ 11,618,645,000**
Market Value of Assets (MVA)	$ 7,977,541,200	$ 8,513,828,800
Future Member Contributions	524,913,700	570,762,600
Future State Contributions & PRI Fund Transfers	2,425,852,400	2,534,053,600
Total Resources	**$ 10,928,307,300**	**$ 11,618,645,000**
Actuarial Liability		
Present Value of Benefits (PVB)	$ 10,928,307,300	$ 11,618,645,000
Present Value of Future State Normal Costs (PVFNC)	898,602,100	1,003,299,200
Present Value of Future Member Contributions (PVFEEC)	524,913,700	570,762,600
Actuarial Liability (AL=PVB–PVFNC–PVFEEC)	**$ 9,504,791,500**	**$ 10,044,583,200**
Actuarial Value of Assets (AVA)	8,460,614,400	8,688,641,300
Net (Surplus)/Unfunded AL (AL – AVA)	**$ 1,044,177,100**	**$ 1,355,941,900**
Present Value of Accrued Benefits		
Present Value of Benefits (PVB)	$ 10,928,307,300	$ 11,618,645,000
Present Value of Future Benefit Accruals (PVFBA)	2,464,021,000	2,680,031,300
Present Value of Accrued Benefits (PVAB=PVB–PVFBA)	**$ 8,464,286,300**	**$ 8,938,613,700**
Market Value of Assets (MVA)	$ 7,977,541,200	$ 8,513,828,800
Net (Surplus)/Unfunded PVAB (PVAB – MVA)	**$ 486,745,100**	**$ 424,784,900**

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:

- State contributions different than expected
- Investment earnings different than expected
- A change in the method 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 liabilities since the last valuation.

Table III-2
Liability Changes

(In Millions)	Present Value of Benefits	Actuarial Liability	Present Value of Accrued Benefits
Liabilities June 30, 2016	$ 10,928	$ 9,505	$ 8,464
Liabilities June 30, 2017	11,619	10,045	8,939
Liability Increase/(Decrease)	691	540	475
Change Due to:			
PRI	0	0	0
Actuarial (Gain)/Loss	NC*	65	NC*
Benefit Changes	6	5	2
Assumption Changes	308	212	237
Benefits Accumulated and Other (Gain)/Loss	378	258	233

*NC = not calculated.

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, 2016	June 30, 2017
1.	Actuarial Liabilities		
	Retiree, Beneficiary, Disabled, and Terminated Members	$ 5,851,217,400	$ 6,139,438,300
	Active Members	3,653,574,100	3,905,144,900
	Total Actuarial Liability (AL)	**$ 9,504,791,500**	**$ 10,044,583,200**
2.	Actuarial Value of Assets (AVA)	$ 8,460,614,400	$ 8,688,641,300
3.	Unfunded Actuarial Liability (UAL) [AL – AVA]	$ 1,044,177,100	$ 1,355,941,900
4.	Present Value of Outstanding PRI Transfers	$ 48,050,200	$ 20,044,300
5.	**Net Base for 20-Year UAL Amortization (3-4)**	**$ 996,126,900**	$ **1,335,897,600**

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 State 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 State normal cost rate for each member. This State normal cost rate times payroll for each active member equals the State normal cost. The sum of the State normal cost amounts for all active members is then divided by the covered payroll for all active members to produce the State normal cost contribution rate.

The actuarial liability is that portion of the present value of projected benefits that will not be paid by future State 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 the present value of scheduled PRI transfers as well, over an open 20-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 0.30% 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 State contribution rates for the Plan based on this funding valuation and the immediately prior one.

Table IV-1
State Contribution Rate

Valuation Date	**June 30, 2016**	**June 30, 2017**
FY Contribution Rate Payable	**FY 2018**	**FY 2019**
State Entry Age Normal Cost Rate	6.10%	6.44%
UAL Amortization Payment Rate	4.02%	5.09%
Administrative Expense Rate	0.30%	0.30%
Actuarially Determined Contributions	10.42%	11.83%

SECTION IV – CONTRIBUTIONS

Table IV-2 below provides additional detail about the development of the State contribution rate as well as the expected dollar amounts these rates will result in for FY 2019.

Table IV-2
Expected FY 2019
State Contributions

	In Dollars	As % of Payroll
1. Present Value of Projected Benefits Attributable to:		
a. Total Normal Cost	$ 197,122,200	9.96%
b. Expected Member Contributions	69,665,700	3.52%
c. State Normal Cost (a) – (b)	$ 127,456,500	6.44%
2. Amortization of Unfunded Liability	100,799,100	5.09%
3. Allowance for Administrative Expense	5,937,400	0.30%
4. Total State Actuarially Determined Contributions (1) + (2) + (3)	$ 234,193,000	11.83%

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, 2016 and June 30, 2017 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, 2016, to the liabilities as of June 30, 2017. These values are based on the funding liability results.

This valuation contains information reported in the June 30, 2017 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 2016 funding valuation results. The calculation of Net Pension Liability in Table V-2 shows the amounts to be disclosed for FY 2017, based on the liabilities of the roll forward of the 2016 funding valuation, as well as a projection of the anticipated FY 2018 disclosures, based on liabilities from the 2017 funding valuation, assuming all actuarial assumptions are met over the coming year. The actual disclosures for FY 2018 will be developed once the asset measure for GASB as of June 30, 2018 is known.

Tables V-3 through V-5 are exhibits to be used for the State'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 Solvency Test, 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 Solvency Test. None of the liabilities or assets shown are appropriate for settlement purposes. Furthermore, the Solvency Test 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 only for the State's CAFR.

SECTION V – ACCOUNTING STATEMENT INFORMATION

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

	June 30, 2016	June 30, 2017
FASB ASC Topic No. 960 Basis		
1. Present Value of Accrued Benefits (PVAB)		
a. Members Currently Receiving Payments	$ 5,641,344,100	$ 5,932,584,000
b. Former Vested Members (and LTDs)	209,873,300	206,854,300
c. Active Members	2,613,068,900	2,799,175,400
2. Total PVAB [1(a) + 1(b) + 1(c)]	$ 8,464,286,300	$ 8,938,613,700
3. Market Value of Assets (MVA)	7,977,541,200	8,513,828,800
4. Unfunded PVAB [2 – 3]	$ 486,745,100	$ 424,784,900
5. Ratio of MVA to PVAB [3 / 2]	94.2%	95.2%
Reconciliation of PVAB		
PVAB at June 30, 2016		$ 8,464,286,300
Increase/(Decrease) During Year Attributable to:		
Passage of Time		587,875,900
Benefits Paid – FY 2017		(598,685,600)
Benefit Change		1,197,400
Assumption Changes		236,610,900
PRI		1,197,400
Benefits Accrued, Other Gains/Losses		247,328,800
Net Increase/(Decrease)		474,327,400
PVAB at June 30, 2017		$ 8,938,613,700

SECTION V – ACCOUNTING STATEMENT INFORMATION

Table V-2
GASB No. 67 Disclosures

	June 30, 2017	Estimated June 30, 2018
Total Pension Liability (TPL)		
Service cost	**$ 180,695,000**	**$ 212,642,000**
Interest	676,524,000	696,787,000
Changes in benefit terms	4,814,000	0
Differences between expected and actual experience	20,308,000	64,746,000
Changes in assumptions	211,698,000	0
Benefit payments, including refunds of member contributions	(598,685,000)	(616,684,000)
Net change in TPL	**$ 495,353,000**	**$ 357,492,000**
TPL - beginning	**$ 9,484,483,000**	**$ 9,979,837,000**
TPL - ending (a)	**$ 9,979,837,000**	**$ 10,337,329,000**
Plan Fiduciary Net Position (FNP)		
Contributions - State	$ 186,625,000	$ 206,226,000
Contributions - Non-employer	30,302,000	10,945,000
Contributions - Member	61,686,000	69,666,000
Net investment income	861,996,000	584,414,000
Benefit payments, including refunds of member contributions	(598,686,000)	(616,684,000)
Administrative expenses	(5,636,000)	(5,937,000)
Net change in FNP	**$ 536,288,000**	**$ 248,630,000**
FNP - beginning	**$ 7,977,541,000**	**$ 8,513,829,000**
FNP - ending (b)	**$ 8,513,829,000**	**$ 8,762,459,000**
Plan Net Pension Liability/(Asset) - ending [(a)-(b)]	**$ 1,466,008,000**	**$ 1,574,870,000**

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

Gain (or Loss) for Year ending June 30,
(expressed in thousands)

Type of Activity	2012	2013	2014	2015	2016	2017
Investment Income on Actuarial Assets	$ (88,902)	$ (31,048)	$ 115,262	$ 10,364	$ (120,768)	$ (43,703)
Combined Liability Experience	(79,091)	71,572	17,908	23,571	(20,308)	(64,746)
(Loss)/Gain During Year from Financial Experience	$ (167,993)	$ 40,524	$ 133,170	$ 33,935	$ (141,076)	$ (108,449)
Non-Recurring Items	(39,896)	(84,221)	(98,842)	(132,191)	(167,455)	(211,698)
Composite Gain (or Loss) During Year	$ (207,889)	$ (42,697)	$ 34,328	$ (98,256)	$ (308,531)	$ (320,147)

Table V-5
Solvency Test
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)
2017	$ 704,684	$ 5,932,584	$ 3,407,315	$ 8,688,641	100%	100%	60%
2016	666,617	5,641,344	3,196,831	8,460,614	100	100	67
2015	657,050	5,172,570	3,221,414	8,289,879	100	100	76
2014	633,353	4,901,957	3,204,762	8,067,032	100	100	79
2013	606,874	4,600,135	3,050,261	7,519,770	100	100	76
2012	629,639	4,370,623	2,949,593	7,270,430	100	100	77

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan
Data Reconciliation

	A	P-TDV	P-SUPP	P-RET	PRET25	P-DIS	P-LTD	P-SURV	PSUR25	Total
1. June 30, 2016 valuation	**36,198**	**3,374**	**0**	**20,979**	**0**	**1,646**	**647**	**3,554**	**0**	**66,398**
2. Additions										
(a) New entrants	3,740	11		105		4	1			3,861
(b) New Beneficiary/QDRO								278	4	282
(c) Total	3,740	11		105		4	1	278	4	4,143
3. Reductions										
(a) Terminated - not vested	(1,449)									(1,449)
(b) Paid Out/Expired/Death		(146)		(569)		(75)	(35)	(223)		(1,048)
(c) Total	(1,449)	(146)		(569)		(75)	(35)	(223)		(2,497)
4. Changes in status										
(a) P-TDV	(463)	537					(72)	(2)		
(b) P-SUPP		(1,214)	1,242				(28)			
(c) Returned to work	145	(117)		(8)		(1)	(19)			
(d) P-RET	(859)	(204)		1,136		(1)	(72)			
(e) PRET25	(43)				43					
(f) P-DIS	(6)	(1)				10	(3)			
(g) P-LTD	(143)	(12)		(1)			156			
(h) P-SURV										
(i) PSUR25										
(j) P-SR										
(k) Data corrections	(1)						(2)			(3)
(l) Total	(1,370)	(1,011)	1,242	1,127	43	8	(40)	(2)		(3)
5. June 30, 2017 valuation	**37,119**	**2,228**	**1,242**	**21,642**	**43**	**1,583**	**573**	**3,607**	**4**	**68,041**

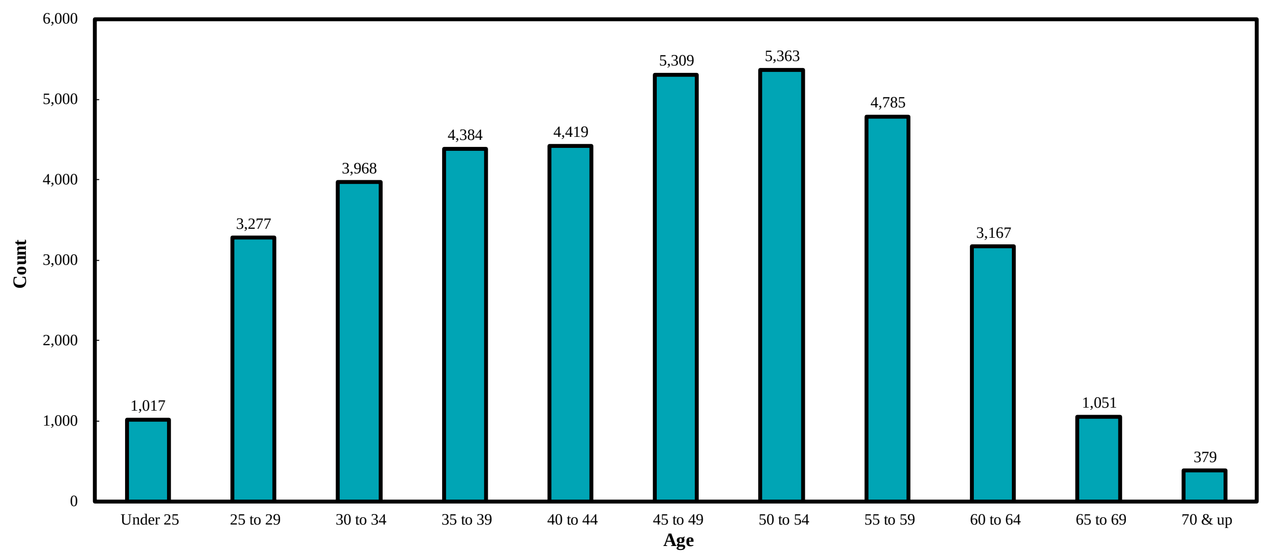
A=Active, P-TDV=Terminated Deferred Vested, P-SUPP=Terminated Deferred Vested, P-RET=Retired, PRET25=Retired, P-DIS=Disabled, P-LTD-Long-Term Disabled, P-SURV=Surviving Beneficiary, PSUR25=Surviving Beneficiary

APPENDIX A – MEMBERSHIP INFORMATION

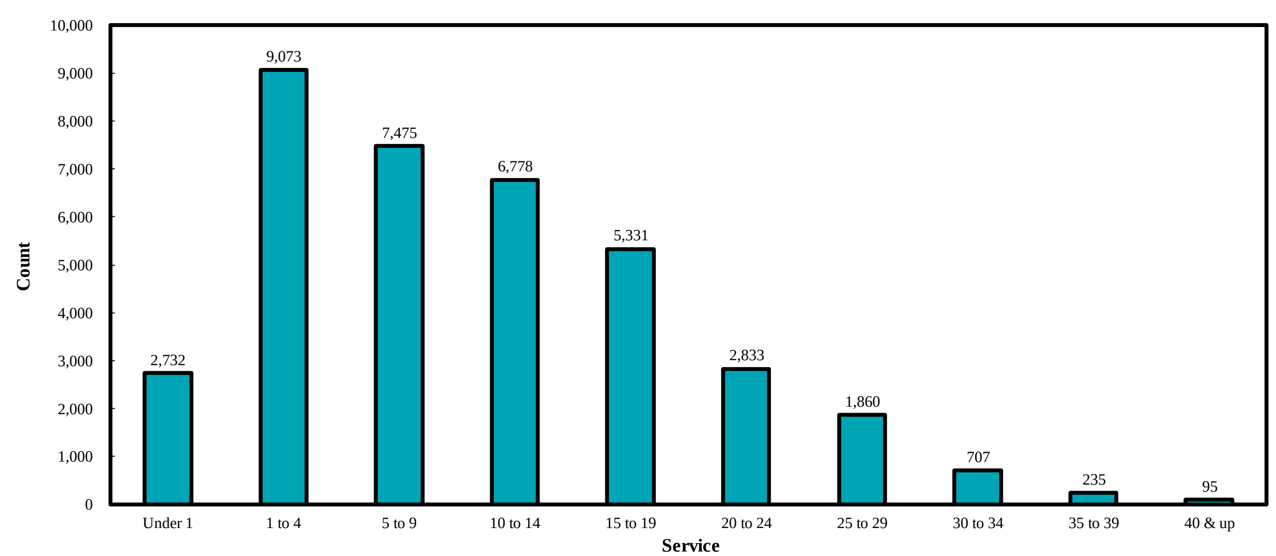
Delaware State Employees' Pension Plan Population Distribution of Active Members by Age and Service as of June 30, 2017											
Counts By Age/Service											
	Service										
Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	**Total**
Under 25	445	568	4	0	0	0	0	0	0	0	1,017
25 to 29	575	2,075	614	13	0	0	0	0	0	0	3,277
30 to 34	354	1,455	1,590	559	10	0	0	0	0	0	3,968
35 to 39	291	1,122	1,093	1,424	449	5	0	0	0	0	4,384
40 to 44	254	919	851	979	1,135	275	6	0	0	0	4,419
45 to 49	266	941	946	1,012	999	816	322	7	0	0	5,309
50 to 54	246	803	889	1,012	940	653	645	164	11	0	5,363
55 to 59	165	645	728	901	927	579	458	285	97	0	4,785
60 to 64	90	359	493	603	623	366	309	193	92	39	3,167
65 to 69	33	140	197	196	180	109	89	47	21	39	1,051
70 & up	13	46	70	79	68	30	31	11	14	17	379
Total	2,732	9,073	7,475	6,778	5,331	2,833	1,860	707	235	95	37,119

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Population Distribution of Active Members by Age as of June 30, 2017



Delaware State Employees' Pension Plan Population Distribution of Active Members by Service as of June 30, 2017



APPENDIX A – MEMBERSHIP INFORMATION

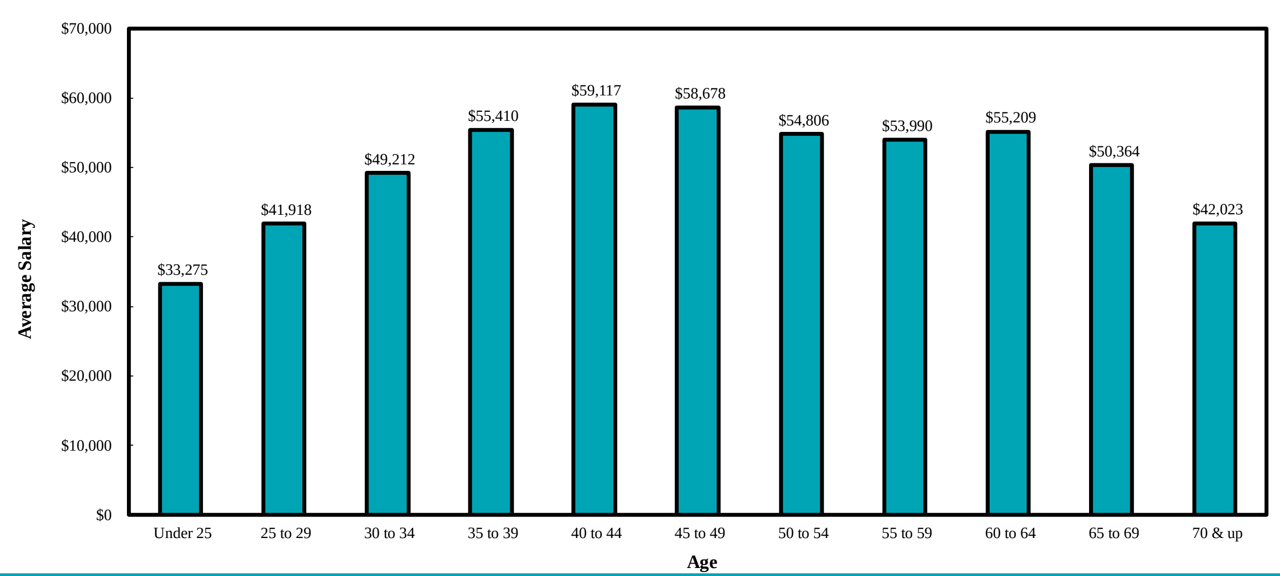
Delaware State Employees' Pension Plan Salary Distribution of Active Members by Age and Service as of June 30, 2017

Average Salary by Age/Service

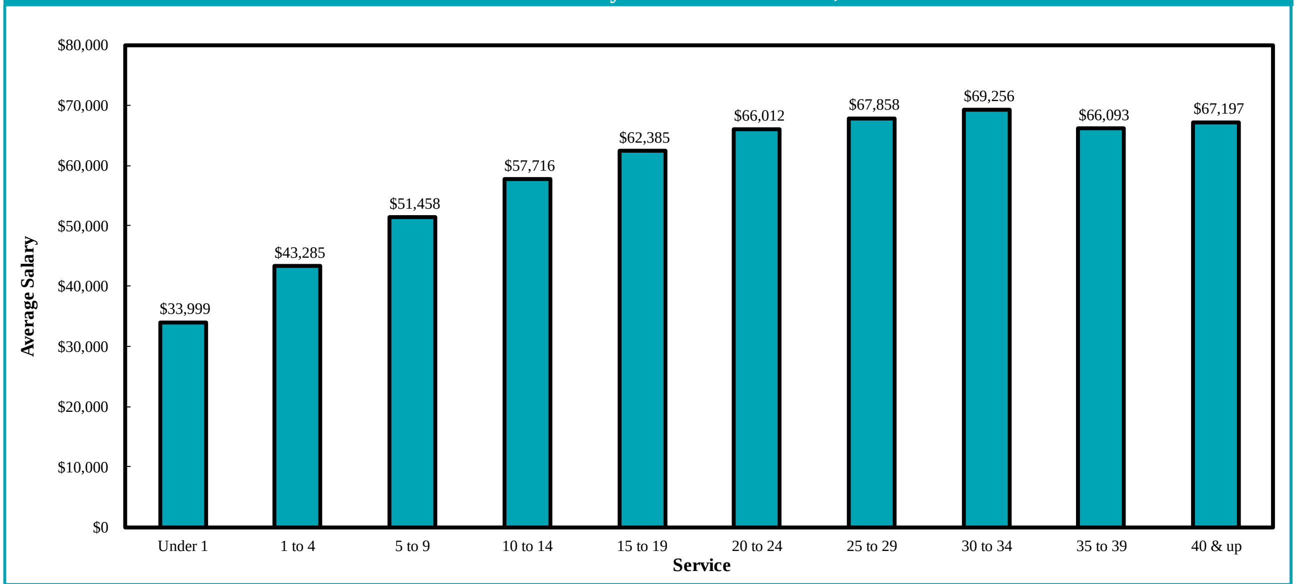
	Service										
Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	**Total**
Under 25	$ 29,023	$ 36,656	$ 26,188	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 33,275
25 to 29	33,534	41,723	50,444	41,407	0	0	0	0	0	0	41,918
30 to 34	34,400	44,550	53,708	58,130	38,387	0	0	0	0	0	49,212
35 to 39	37,451	45,299	55,330	63,720	66,335	39,251	0	0	0	0	55,410
40 to 44	35,565	46,950	56,138	62,958	70,140	71,516	62,218	0	0	0	59,117
45 to 49	36,889	46,635	52,350	59,714	65,890	73,097	68,537	47,628	0	0	58,678
50 to 54	34,986	42,733	48,131	53,273	58,797	64,210	70,737	66,544	51,425	0	54,806
55 to 59	34,238	41,546	46,489	52,256	56,807	60,954	65,425	73,903	61,779	0	53,990
60 to 64	36,576	43,205	47,391	52,840	57,455	59,786	68,249	67,750	69,629	65,955	55,209
65 to 69	24,300	34,920	42,574	47,611	56,466	62,553	60,242	63,340	70,194	69,948	50,364
70 & up	31,969	24,849	28,815	40,129	45,412	52,677	55,913	54,749	78,112	63,733	42,023
Total	$ 33,999	$ 43,285	$ 51,458	$ 57,716	$ 62,385	$ 66,012	$ 67,858	$ 69,256	$ 66,093	$ 67,197	$ 53,292

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Salary Distribution of Active Members by Age as of June 30, 2017



Delaware State Employees' Pension Plan Salary Distribution of Active Members by Service as of June 30, 2017



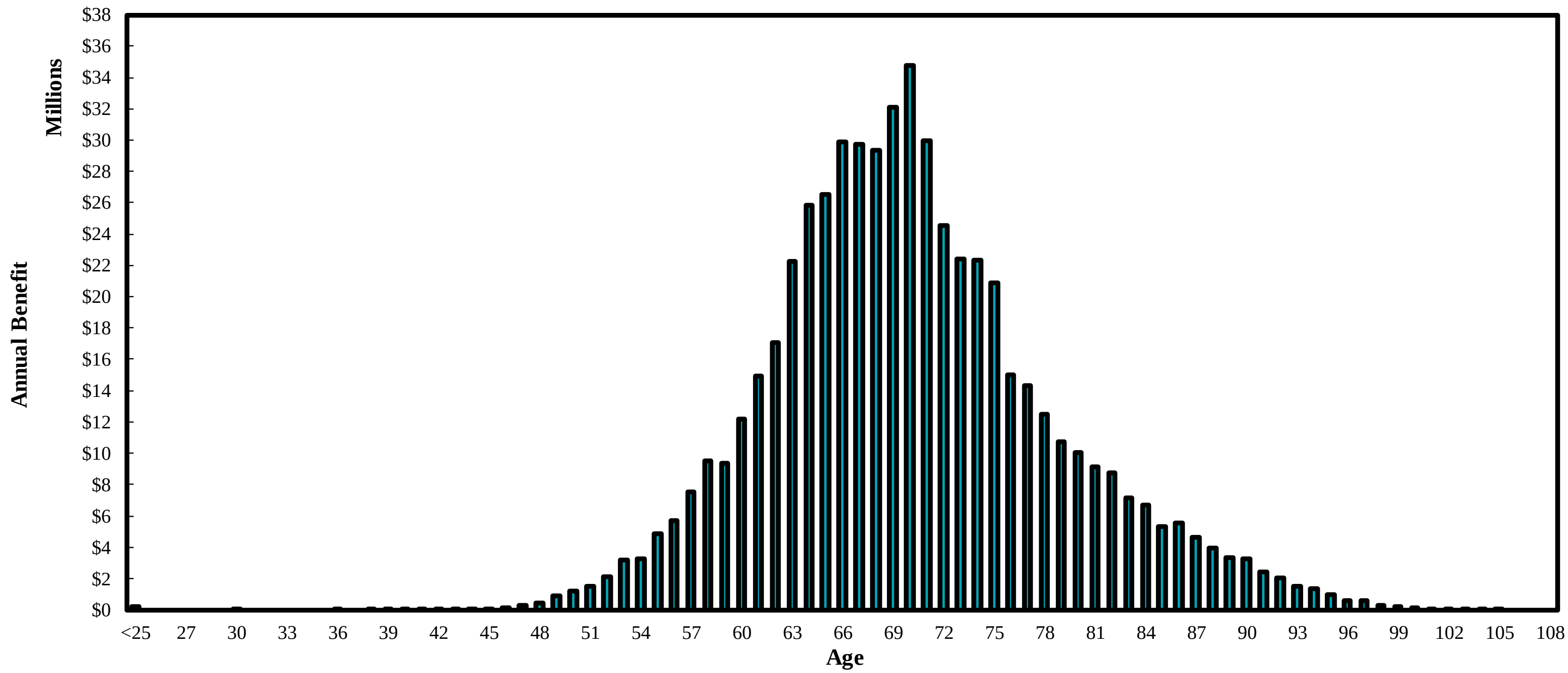
APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution by Age of Retired Members and Beneficiaries as of June 30, 2017

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	32	$ 227,709	73	881	$ 22,409,427
25	0	-	74	958	22,366,471
26	0	-	75	920	20,912,169
27	0	-	76	726	15,024,655
28	0	-	77	701	14,294,302
29	0	-	78	629	12,486,331
30	1	5,381	79	581	10,719,008
31	0	-	80	554	10,011,649
32	0	-	81	519	9,140,064
33	0	-	82	521	8,757,601
34	0	-	83	481	7,164,734
35	0	-	84	446	6,726,382
36	2	7,335	85	416	5,303,187
37	0	-	86	400	5,563,266
38	2	11,960	87	355	4,617,780
39	6	30,730	88	293	3,971,095
40	3	5,865	89	273	3,349,850
41	3	36,805	90	268	3,245,088
42	1	14,989	91	199	2,387,274
43	2	22,814	92	171	2,027,909
44	5	33,686	93	133	1,482,027
45	6	45,136	94	115	1,316,140
46	9	110,735	95	100	980,787
47	15	273,601	96	64	580,570
48	32	449,470	97	49	616,575
49	39	903,538	98	32	313,151
50	56	1,159,095	99	25	197,411
51	59	1,491,166	100	13	161,818
52	85	2,078,969	101	5	29,175
53	111	3,156,766	102	5	62,163
54	122	3,253,170	103	3	53,234
55	165	4,830,226	104	2	18,292
56	210	5,689,158	105	3	18,549
57	285	7,529,002	106	0	-
58	333	9,532,292	107	0	-
59	328	9,347,604	108	0	-
60	407	12,156,681	109	1	8,058
61	503	14,939,782	110	0	-
62	612	17,059,335	111	0	-
63	862	22,246,479	112	0	-
64	947	25,829,249	113	0	-
65	1,022	26,508,230	114	0	-
66	1,117	29,850,945	115	0	-
67	1,194	29,764,343	116	0	-
68	1,167	29,390,055	117	0	-
69	1,225	32,117,669	118	0	-
70	1,365	34,776,128	119	0	-
71	1,178	29,970,274	120	0	-
72	943	24,548,608			
			Totals	25,296	$575,721,172

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution by Age of Retired Members and Beneficiaries as of June 30, 2017



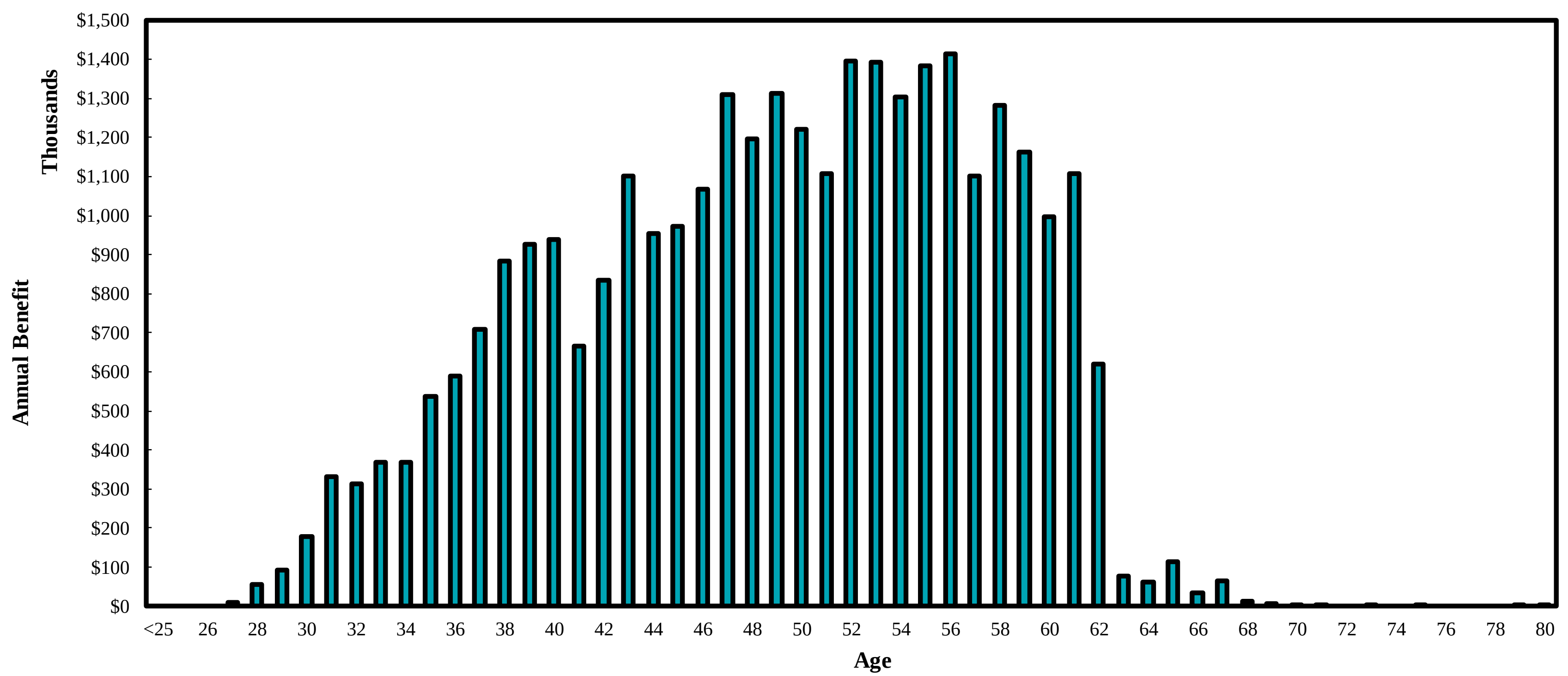
APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution by Age of Vested Members as of June 30, 2017

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	$ -	73	1	$ 1,645
25	0	-	74	0	-
26	0	-	75	1	194
27	4	9,299	76	0	-
28	10	56,685	77	0	-
29	18	92,083	78	0	-
30	33	179,346	79	1	1,459
31	55	331,928	80	1	3,260
32	58	313,059	81	0	-
33	52	367,651	82	0	-
34	61	368,946	83	0	-
35	73	536,576	84	0	-
36	81	588,672	85	0	-
37	94	707,865	86	0	-
38	104	884,591	87	0	-
39	107	925,271	88	0	-
40	106	938,167	89	0	-
41	79	664,822	90	0	-
42	92	835,267	91	0	-
43	109	1,101,853	92	0	-
44	113	952,757	93	0	-
45	115	971,973	94	0	-
46	109	1,066,855	95	0	-
47	114	1,309,633	96	0	-
48	123	1,195,074	97	0	-
49	127	1,312,501	98	0	-
50	119	1,221,890	99	0	-
51	122	1,107,291	100	0	-
52	134	1,397,362	101	0	-
53	128	1,393,800	102	0	-
54	117	1,304,060	103	0	-
55	144	1,383,890	104	0	-
56	138	1,414,782	105	0	-
57	112	1,101,036	106	0	-
58	133	1,282,494	107	0	-
59	127	1,162,057	108	0	-
60	116	998,457	109	0	-
61	127	1,108,796	110	0	-
62	72	620,476	111	0	-
63	9	77,684	112	0	-
64	8	60,980	113	0	-
65	8	112,277	114	0	-
66	4	34,905	115	0	-
67	5	64,934	116	0	-
68	2	12,336	117	0	-
69	2	5,612	118	0	-
70	1	1,511	119	0	-
71	1	214	120	0	-
72	0	-			
			Totals	3,470	$ 31,584,274

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution by Age of Vested Members as of June 30, 2017



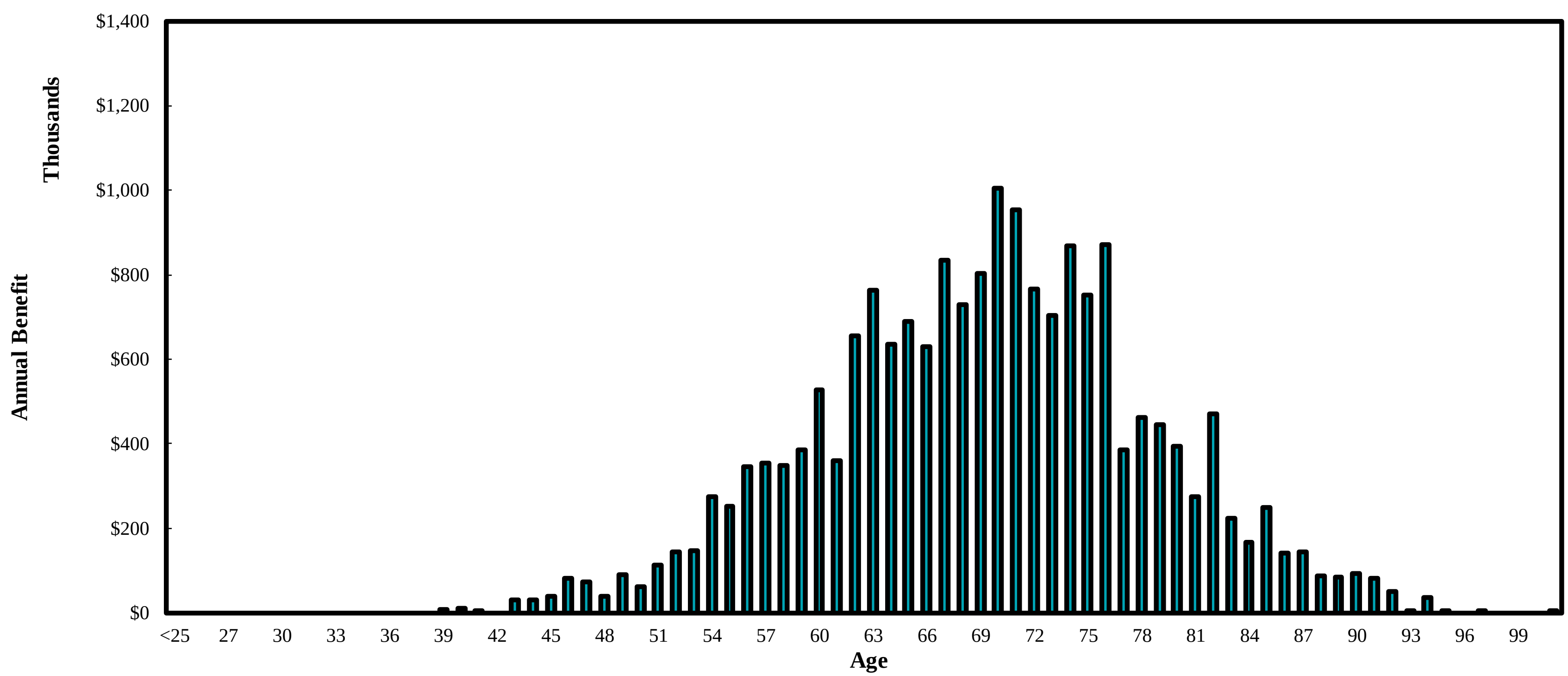
APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution by Age of Disabled Members as of June 30, 2017

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	$ -	73	46	$ 702,385
25	0	-	74	67	867,481
26	0	-	75	60	751,536
27	0	-	76	61	872,579
28	0	-	77	28	385,203
29	0	-	78	42	461,017
30	0	-	79	38	443,906
31	0	-	80	32	392,632
32	0	-	81	26	274,757
33	0	-	82	39	470,837
34	0	-	83	22	222,423
35	0	-	84	18	167,052
36	0	-	85	24	247,670
37	0	-	86	9	142,039
38	0	-	87	15	144,366
39	1	8,318	88	14	85,979
40	2	10,059	89	9	84,683
41	1	4,179	90	10	92,854
42	0	-	91	6	79,973
43	3	29,287	92	4	50,845
44	3	29,576	93	1	3,960
45	4	38,745	94	5	35,344
46	8	81,617	95	1	3,880
47	9	73,427	96	0	-
48	2	38,440	97	1	3,724
49	8	88,692	98	0	-
50	9	61,196	99	0	-
51	13	112,960	100	0	-
52	17	144,453	101	1	5,646
53	17	145,391	102	0	-
54	21	274,328	103	0	-
55	21	251,350	104	0	-
56	28	346,195	105	0	-
57	31	354,874	106	0	-
58	34	349,319	107	0	-
59	29	386,606	108	0	-
60	37	528,169	109	0	-
61	40	359,677	110	0	-
62	57	654,090	111	0	-
63	57	764,368	112	0	-
64	54	633,957	113	0	-
65	58	688,623	114	0	-
66	52	630,001	115	0	-
67	59	834,670	116	0	-
68	64	729,382	117	0	-
69	70	802,064	118	0	-
70	71	1,004,391	119	0	-
71	66	955,035	120	0	-
72	58	767,214			
			Totals	1,583	$ 19,173,425

APPENDIX A – MEMBERSHIP INFORMATION

**Delaware State Employees' Pension Plan Annual Benefit
Distribution by Age of Disabled Members as of June 30, 2017**

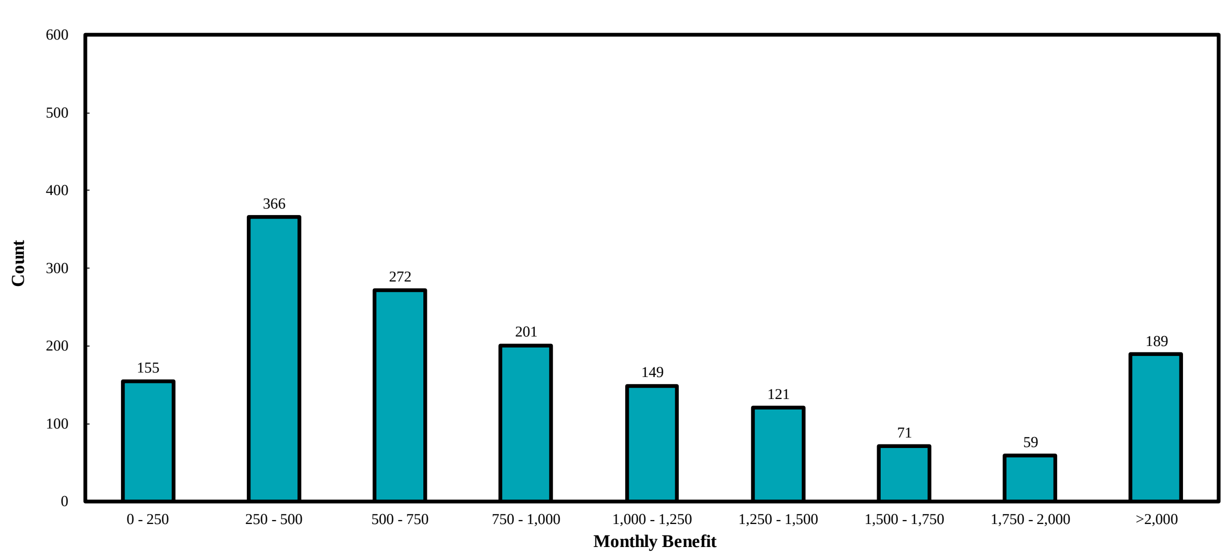


APPENDIX A – MEMBERSHIP INFORMATION

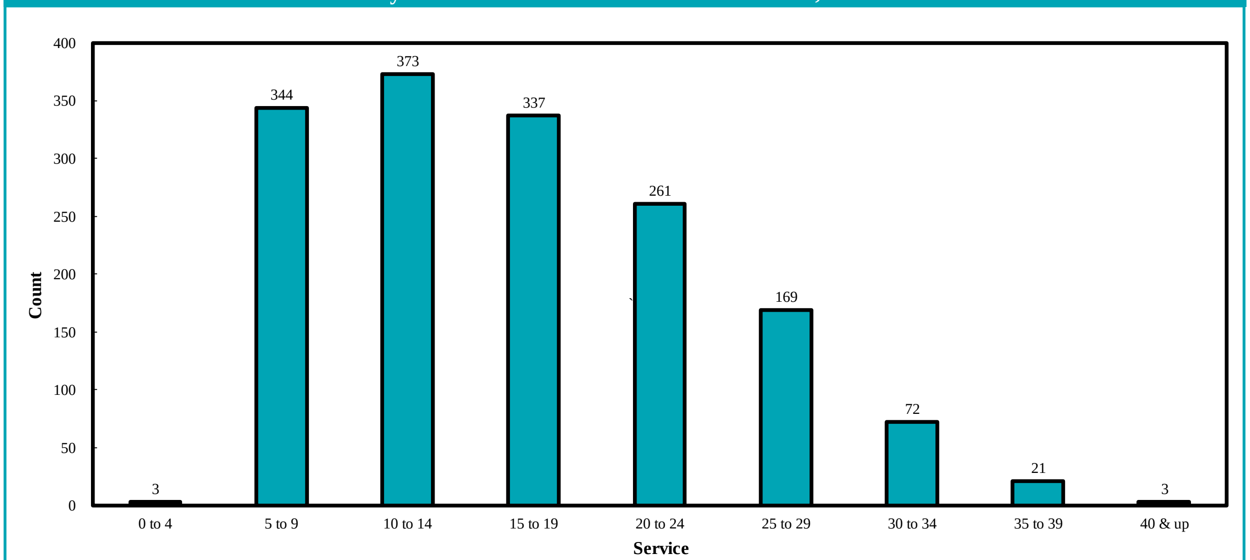
Delaware State Employees' Pension Plan Annual Benefit Distribution by Service of Disabled Members as of June 30, 2017										
Counts By Benefit/Service										
Monthly	**Service**									
Benefit	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	**Total**
0 - 250	0	139	15	1	0	0	0	0	0	155
250 - 500	2	163	147	43	10	1	0	0	0	366
500 - 750	1	30	123	80	32	6	0	0	0	272
750 - 1,000	0	9	44	90	41	12	5	0	0	201
1,000 - 1,250	0	2	21	52	53	16	5	0	0	149
1,250 - 1,500	0	1	12	35	43	23	5	2	0	121
1,500 - 1,750	0	0	7	13	24	21	5	1	0	71
1,750 - 2,000	0	0	1	9	23	18	5	3	0	59
>2,000	0	0	3	14	35	72	47	15	3	189
Total	3	344	373	337	261	169	72	21	3	1,583

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution of Disabled Members as of June 30, 2017



Delaware State Employees' Pension Plan Annual Benefit Distribution by Service of Disabled Members as of June 30, 2017



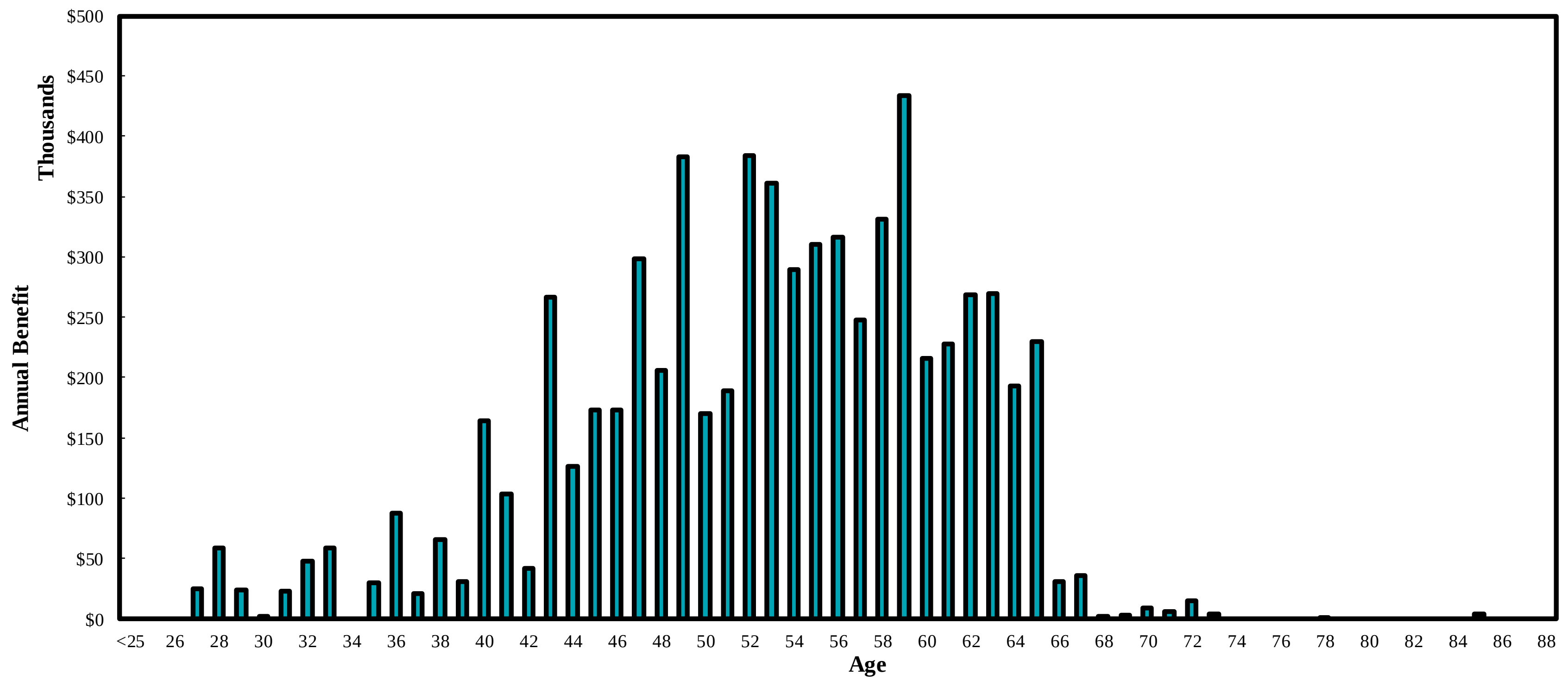
APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution by Age of Long-Term Disability Members as of June 30, 2017

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	$ -	73	1	$ 3,973.92
25	0	-	74	0	-
26	0	-	75	0	-
27	1	24,215	76	0	-
28	2	58,541	77	0	-
29	1	23,610	78	1	144
30	1	1,448	79	0	-
31	1	22,332	80	0	-
32	2	47,680	81	0	-
33	7	58,884	82	0	-
34	0	-	83	0	-
35	3	29,684	84	0	-
36	5	87,617	85	1	3,463
37	1	20,731	86	0	-
38	3	65,107	87	0	-
39	3	30,525	88	0	-
40	9	163,851	89	0	-
41	7	103,110	90	0	-
42	4	41,608	91	0	-
43	15	266,771	92	0	-
44	6	125,992	93	0	-
45	14	172,840	94	0	-
46	12	172,687	95	0	-
47	16	298,667	96	0	-
48	15	206,000	97	0	-
49	22	383,008	98	0	-
50	12	169,870	99	0	-
51	12	188,941	100	0	-
52	28	383,884	101	0	-
53	28	361,537	102	0	-
54	22	289,803	103	0	-
55	27	310,093	104	0	-
56	36	316,835	105	0	-
57	26	247,603	106	0	-
58	29	331,694	107	0	-
59	36	433,950	108	0	-
60	21	216,294	109	0	-
61	25	227,721	110	0	-
62	28	268,986	111	0	-
63	28	269,694	112	0	-
64	22	192,961	113	0	-
65	20	229,302	114	0	-
66	6	31,045	115	0	-
67	7	35,485	116	0	-
68	1	1,949	117	0	-
69	1	2,964	118	0	-
70	2	8,553	119	0	-
71	1	6,262	120	0	-
72	2	14,878			
			Totals	573	$ 6,952,790

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Employees' Pension Plan Annual Benefit Distribution by Age of Long Term Disability Members as of June 30, 2017



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):

(2017 Values Shown)		
Age	**Male**	**Female**
25	5	2
30	5	2
35	5	3
40	7	4
45	10	6
50	18	11
55	30	17
60	50	25
65	89	37
70	151	63
75	258	109
80	436	188

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.

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):

(2017 Values Shown)		
Age	Male	Female
50	43	27
55	62	36
60	83	52
65	118	80
70	183	129
75	299	211
80	503	357
85	877	633
90	1,545	1,131
95	2,439	1,862
100	3,491	2,789

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.

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):

(2017 Values Shown)		
Age	**Male**	**Female**
25	92	27
30	88	35
35	104	48
40	125	67
45	194	104
50	237	137
55	273	173
60	311	205
65	372	249
70	481	339
75	659	497
80	940	750
85	1,399	1,135
90	2,145	1,681
95	3,009	2,445
100	3,963	3,437

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.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

b. Rates of Active Disability

Rates of Active Disability	
Age	**Rates**
20	0.0522%
25	0.0522
30	0.1831
35	0.2694
40	0.3821
45	0.4643
50	0.6214
55	0.8579
60	1.0699

Rates of Active Disability for those who opted into the Disability Insurance Program*	
Age	**Rates**
65	1.3018%
70	1.3464
75	1.7914
80	1.0234

* For those who remained in the Pension Plan for disability purposes, the assumption stops at age 64.

c. Termination of Employment (Prior to Retirement Eligibility)

Rates of Termination*	
Service	**Rates**
0	16.5%
1	15.5
2	11.0
3	9.0
4	7.5
5	6.5
6	5.0
7	4.5
8	4.0
9	3.5
10-11	3.0
12-13	2.5
14-15	2.0
16-18	1.5
19-24	1.0
25+	0.0

* Termination rates zero once member has reached early or normal retirement eligibility regardless of service.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

d. Rates of Retirement

Employees (including Elected Officials and Correctional Officers/Specified Peace Officers):

	Retirement Rates*	
Service	Early**	Normal
5-14	0.00%	15.00%
15	7.50%	20.00%
16	5.00%	17.50%
17	5.00%	15.00%
18	5.00%	12.50%
19	5.00%	15.00%
20	7.50%	30.00%
21	7.50%	27.50%
22-23	7.50%	20.00%
24	7.50%	17.50%
25	10.00%	27.50%
26	5.00%	20.00%
27-28	5.00%	25.00%
29	12.50%	25.00%
30	N/A	25.00%
>=31	N/A	20.00%

* Rates only applicable if member meets eligibility.

** Early retirement is increased by 5% for Correctional Officers (HB207, SB50, HB363, and HA1 Employees) classified as hazardous duty level A-1 where their early retirement is unreduced.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

e. Salary Increase

30-year service-based table includes an annual inflation rate of 2.50%.

Service	Increase
0	11.50%
1	7.50
2	6.25
3	5.75
4	5.50
5	5.15
6	4.80
7	4.60
8	4.20
9	4.00
10	3.80
11	3.70
12	3.50
13	3.35
14	3.20
15	3.10
16	3.00
17	2.90
18	2.80
19	2.70
20	2.60
21+	2.50

f. Family Composition

Female spouses are assumed to be three years younger than males. 70% are assumed married for both male and female employees. Actual marital characteristics are used for pensioners.

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:	0.30%

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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

The investment rate of return was reduced from 7.2% to 7.0%.

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 State 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 State 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 not expected to be paid through PRI transfers is amortized over a rolling 20-year period as a percentage of payroll. PRI transfers are made to pay for each PRI as granted over a five-year period. These transfers are treated as a receivable for purposes of developing the State rate. 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 for a more level contribution rate over time.

2. Actuarial Value of Assets

For purposes of determining the State 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 full-time and regular part-time employees of the State of Delaware, which includes:

- State Department of Public Education,
- School Districts' part of the State School System (the membership includes 19 school districts),
- Delaware Department of Finance, State Lottery Office,
- Delaware Department of Transportation,
- Delaware Solid Waste Authority (1986),
- Delaware State University,
- Delaware Technical & Community College,
- University of Delaware (excluding most faculty and designated professional staff), and
- State Agencies supported wholly or in part by federal funds granted to the State.

There are two groups that have slightly different benefit structures within the Plan: Elected Officials (EO) and Correctional Officers/Specified Peace Officers (CO/SPD). Where the benefits for these groups vary from the remainder of the members covered in this Plan, this is noted in the remainder of this summary.

2. Member Contributions

Pre-2012 hires:	3% of compensation in excess of $6,000 per annum
Post-2011 hires:	5% of compensation in excess of $6,000 per annum

Interest is credited at the rate of 5% per year. Member contributions are made through an "employer pick-up" arrangement that results in deferral of taxes on the contributions.

CO/SPO members pay an additional 2% of compensation in excess of $6,000 per annum.

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 of any 36 months comprised of three periods of 12 consecutive months (or shorter period of total service) of compensation paid to the member, including salary, wages and fees, plus overtime payments and special payments for extra duty. Overtime payments are excluded for Post – 2011 hires.

5. Normal Retirement

Eligibility: Pre-2012 hires: (i) age 62 with five years of credited service, or (ii) age 60 with 15 years of credited service, or (iii) any age with 30 years of credited service

Post-2011 hires: (i) age 65 with 10 years of credited service, or (ii) age 60 with 20 years of credited service, or (iii) any age with 30 years of credited service

EO Pre-2012 hires: (i) age 60 with five years of credited service or (ii) age 55 with 10 years of credited service

EO Post-2011 hires: (i) age 65 with 10 years of credited service, or (ii) age 60 with 20 years of credited service, or (iii) any age with 30 years of credited service

Benefit: 2.0% of final average compensation multiplied by years of service prior to January 1, 1997 plus 1.85% of final average compensation multiplied by years of service after January 1, 1997.

CO/SPD members covered by HB207 and SB50 receive a benefit of 2.45% of final average compensation in lieu of the 1.85% multiplier for years of service greater than 25.

CO/SPD members covered by HB363 and HA1 receive a benefit of 2.45% of final average compensation in lieu of the 1.85% multiplier for years of service greater than 25 for retirements on or after January 1, 2019.

EO members elected before February 1, 1997 additionally have a minimum benefit equal to the member's years of service as an elected member of the General Assembly times the highest rate of payment being paid to any retired member of the General Assembly, with that rate computed by dividing the retired member's monthly pension by the member's years of service as an elected member of the General Assembly.

6. Early Retirement

Eligibility: (i) age 55 with 15 years of credited service, or (ii) any age with 25 years of credited service

Benefit: Normal retirement benefit calculated using final average compensation and service at early retirement, and reduced by 0.2% (by 0.4% if post-2011 hire) for each month which retirement age precedes the earlier of age 60 or the attainment of 30 years of service.

CO/SPO members covered by HB207 and SB50 receive an early retirement benefit with no reduction if they have at least 25 years of State service, including at least 20 years as a Correctional Officer.

CO/SPO members covered by HB363 and HA1 receive an early retirement benefit with no reduction for retirements on or after January 1, 2019 if they have at least 25 years of State service, including at least 20 years as a Correctional Officer.

7. Disability Benefit

Eligibility: Five years of credited service and eligible disability

Benefit: Normal retirement benefit calculated using service and salary at disability date

A member who opted into the Disability Insurance Program will not receive a benefit from this plan until they reach normal retirement eligibility. All members hired on or after January 1, 2006 are covered by the Disability Insurance Program and thus will not receive a benefit from this plan until they reach normal retirement eligibility.

For EO members, the minimum benefit described in the normal retirement section also applies.

8. Survivor's Benefit

Eligibility: Five years of credited service and death while active

Benefit: For eligible survivors of employees who die in active service: 75% of service pension the employee would have been eligible to receive at age 62, calculated using final average compensation and credited service accrued to the date of death and reduced by 3% for the form of payment. If the surviving spouse has not yet attained age 50, the benefit will be actuarially reduced for each month he or she is under 50. However, this actuarial reduction will not apply for any period in which the survivor has a dependent child.

Eligible survivors include: (1) spouse (legally married/civil union), or (2) child or children under 18, 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. If no eligible survivors, accumulated contributions with interest over aggregate pension payments are payable to the beneficiary.

9. Burial Benefit

$7,000 lump sum, paid at death after disability or service retirement of a member

10. Vesting

Eligibility: Pre-2012 hires: Employees who separate from service with at least five years of service

Post-2011 hires: Employees who separate from service with at least 10 years of service

Benefit: Accrued normal retirement benefit, payable at age 62 for Pre-2012 hires and age 65 for Post-2011 hires. 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.

11. Withdrawal of Employee Contributions

Eligibility: Terminates service and is not eligible for other benefits

Benefit: Accumulated employee contributions with interest

12. 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.

13. Cost-of-Living Adjustment

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

14. Changes Since Last Valuation

The provisions of House Bill 363 and House Amendment 1 from the 2016 Legislature were first effective this year. The bill provided unreduced benefits at 25 years of service to Correctional Officers, in addition to those covered by House Bill 207 and Senate Bill 50, for retirements on and after January 1, 2019. For service after 25 years, they receive a higher benefit multiplier and they must pay an additional 2% of annual compensation in excess of $6,000.

CHEIRON

Classic Values, Innovative Advice