CHEIRON Classic Values, Innovative Advice

Delaware State Volunteer Firemen's Pension Plan

Actuarial Valuation as of June 30, 2020

Produced by Cheiron

February 2021

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February 19, 2021

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 Volunteer Firemen's Pension Plan (Plan) as of June 30, 2020. 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 Delaware State Volunteer Firemen contributions for Fiscal Year (FY) 2021 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.

This report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations, 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 Volunteer Firemen's 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.

This report does not contain any adjustments for the potential impact of COVID-19 on either economic or demographic assumptions. We anticipate that the virus may have implications in both the short and long term, but the net impact of these is not determinable at this time.

Sincerely,
Cheiron

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 Volunteer Firemen's Pension Plan (Plan) as of June 30, 2020. 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 amount** to be paid by the participating employers for Fiscal Year (FY) 2021, 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 reviews the primary risks facing the Plan, and quantifies these using various risk and maturity measures.

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

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

Section V presents the FY 2021 actuarially determined contribution for participating employers.

Section VI 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.

SECTION I – BOARD SUMMARY

General Comments

The actuarially determined contribution (ADC) amount was calculated to decrease from $1,917,900 for FY 2020 to $1,896,800 for FY 2021.

During the year ended June 30, 2020, the Plan's assets earned 5.3% 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 6.2%. This return was less than the assumed investment rate of return of 7.0% for the prior year, resulting in an actuarial loss on investments of $170,000.

The Plan experienced an actuarial loss on plan liabilities resulting from members retiring, terminating, and dying at rates different from the actuarial assumptions. This liability loss increased the actuarial liability by $720,000. This type of gain or loss is normal in the course of plan experience, as we cannot predict exactly how people will behave.

This valuation report also contains certain information to be reported in the June 30, 2020 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 2019 actuarial valuation liability results. The calculation of net pension liability in Section VI is shown as disclosed for the plan year ending June 30, 2020, based on the 2019 funding actuarial valuation liability results, updated by the rollforward described above. We also present a projection of the June 30, 2021 disclosure in Section VI, assuming all actuarial assumptions are exactly met over the coming year, which is based on the 2020 actuarial valuation liability results.

As of the June 30, 2020 funding actuarial valuation, the Plan's unfunded actuarial liability (UAL) was $13.8 million. This is an increase from the $13.3 million UAL in the funding valuation for the prior year.

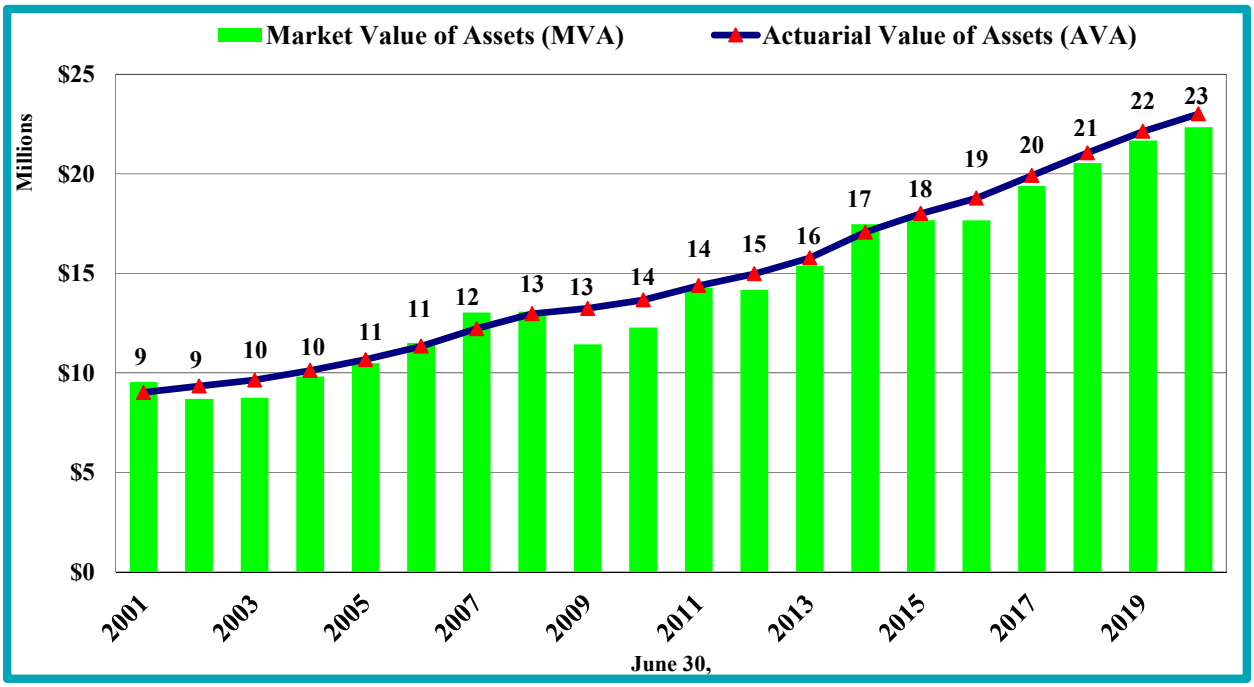
Effective with the June 30, 2020 valuation, the UAL is amortized over a closed 15-year period. Effective with the June 30, 2021 valuation, any new sources of UAL are amortized annually over individual closed 15-year periods as a level dollar amount.

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 5.3% over the last year. The determination of the Plan's actuarial value of assets (AVA) for the current year reflects a portion of this return below the 7.0% assumed, and continued recognition of prior years' gains and losses, with the combined effect of returning 6.2% over FY 2020.

Over the period July 1, 2001 to June 30, 2020, the Plan's assets measured using the actuarial value of asset measurements returned a compound just under 7.0%, almost equal to the current valuation assumption of 7.0%. On a market value of assets basis, the Plan returned 6.5% over the same period.

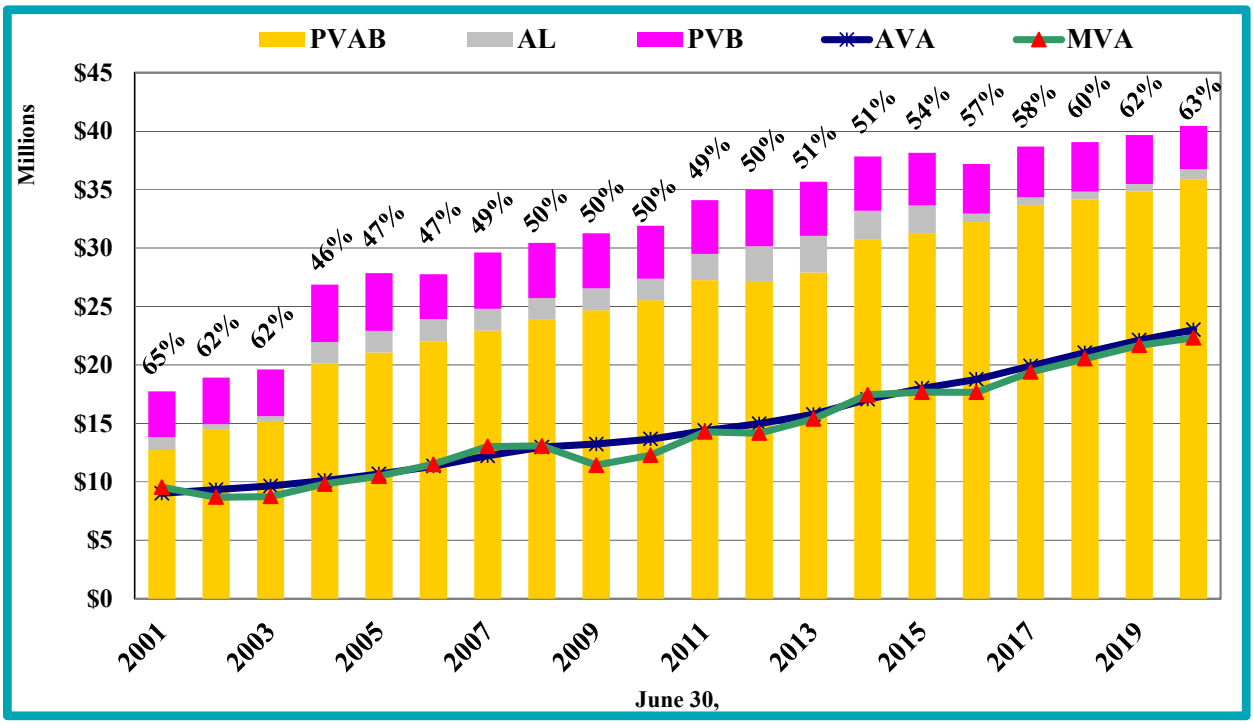
SECTION I – BOARD SUMMARY

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 increases for current members beyond the valuation dates.

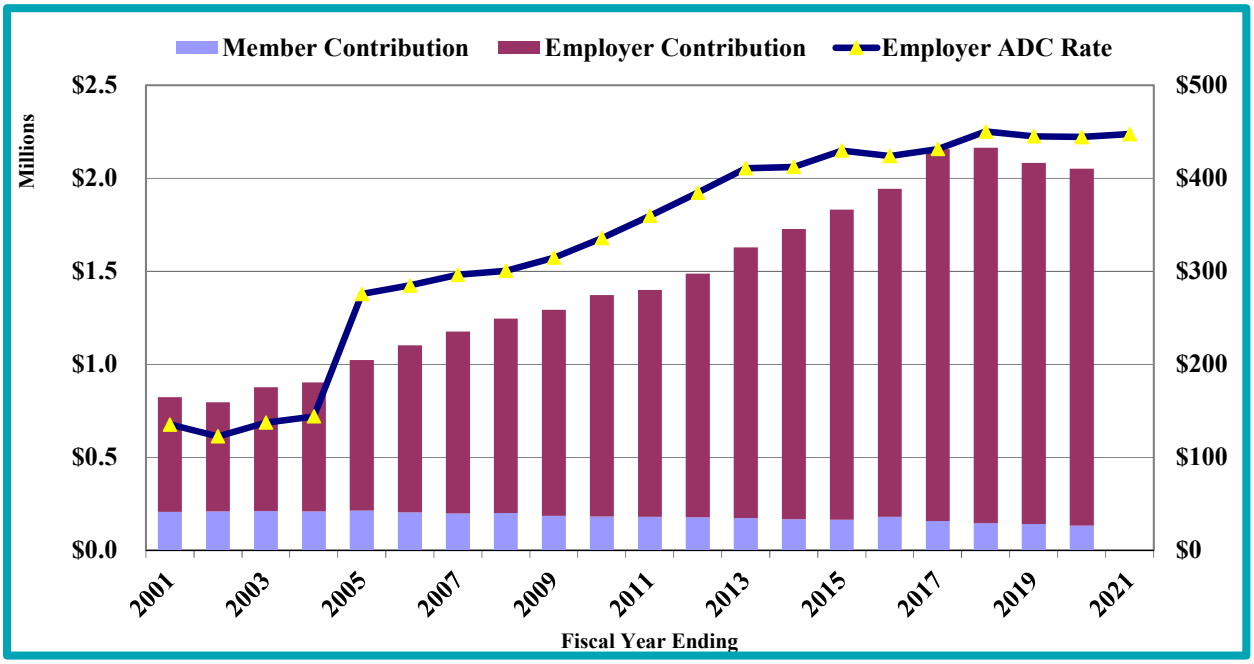
The second liability measure shown is the one currently used for the Plan's funding target, the actuarial liability (AL). These target amounts are represented by the top of the gray bars. This measurement is also the basis of the liability measure used in GASB 67. The funded ratios reported by the Plan 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. 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.



SECTION I – BOARD SUMMARY

Contribution Rates



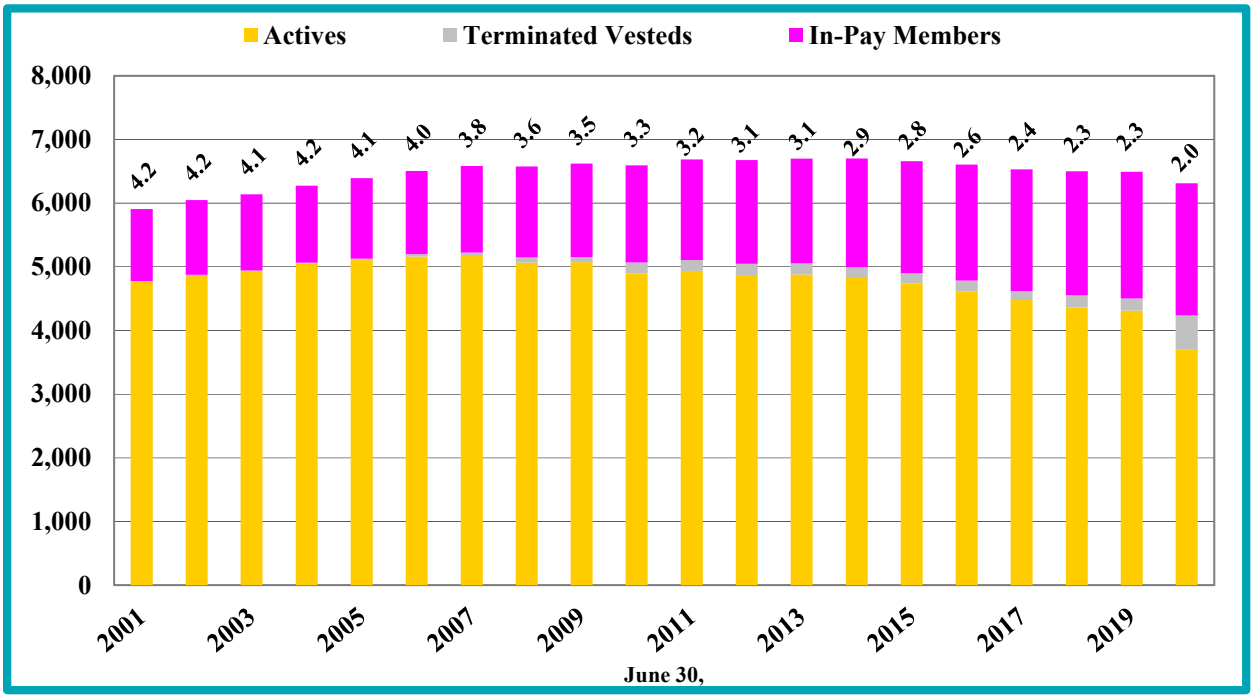
The stacked bars in the graph above show the actual dollar amounts of the contributions made by the participating employers and the members for each fiscal year and are read using the left-hand scale. The blue line shows the employers' per-head actuarially determined contribution (ADC) amount for each fiscal year 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 ADC amount is set by the actuarial process. Please note the timing between when the State contribution rates shown are calculated and when they are payable. For example, the value shown for the FY 2020 is the rate prepared by the June 30, 2019 valuation and implemented for the period July 1, 2019 to June 30, 2020. As such, there is one more year's rate shown beyond the years of actual contributions.

SECTION I – BOARD SUMMARY

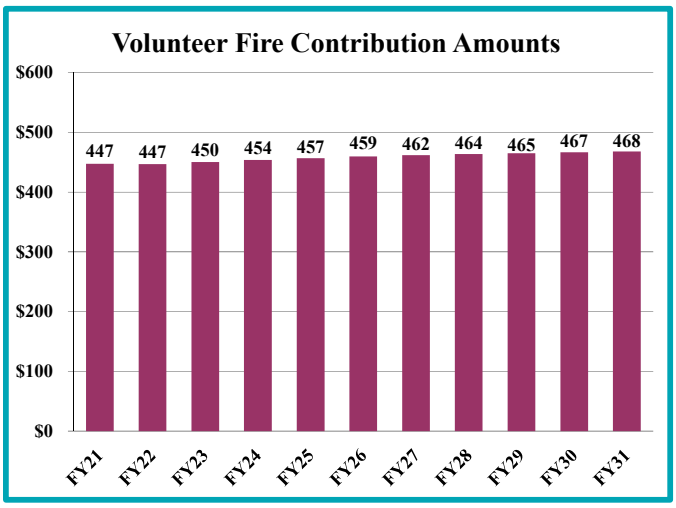
Participant Trends

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. The graph below shows that the number of active members has been dropping in recent years, while there has been an increase in the number of inactives over recent years. The numbers that appear above each bar represent the ratio of active members plus terminated vested members to members in pay at each valuation date. This ratio is different than that used in most pension plans by including the terminated vested members with the actives rather than the retirees. This is due to the funding method of this plan where employer contributions are made on the basis of terminated vested members as well as actives. This ratio has decreased from 4.2 members on whom employers make contributions for each inactive in 2001 to 2.0 actives and terminated vested members for each inactive in 2020. The decrease in active members from 2019 to 2020 was primarily the result of an administrative effort to process pension applications for members with the maximum of 25 years of service.



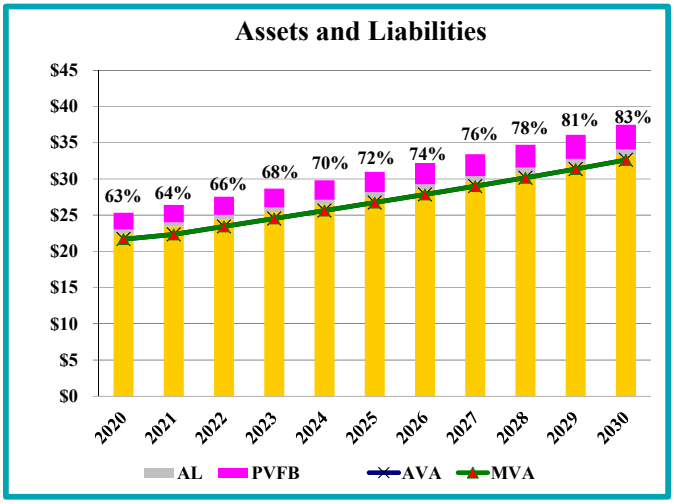
Future Outlook

Baseline Projections



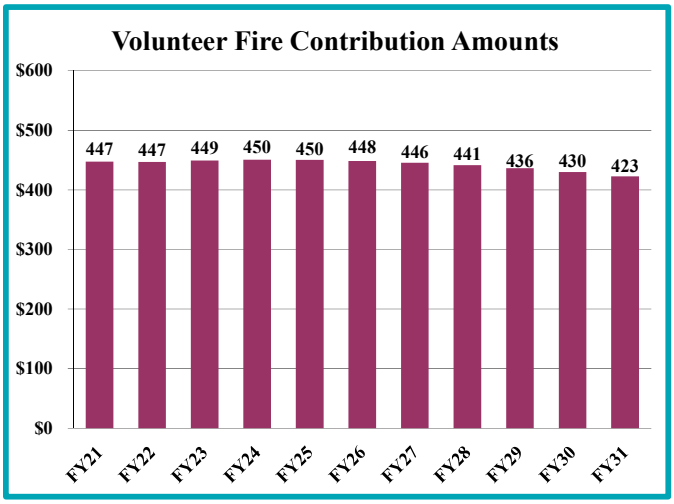
These graphs show the expected progress of the Plan over the next 10 years, assuming the Plan's assets earn 7.0% on a *market value* basis and assuming all other assumptions are exactly met, including that the actuarially determined contribution (ADC) amounts are made in full. The chart entitled "Volunteer Fire Contribution Amounts" shows that the projected employer ADC amount per head is expected to increase over this 10-year period, as the existing losses are recognized.

The "Assets and Liabilities" graph shows the projected funded ratios on an actuarial value of assets basis for the Plan over the 10-year projection period. The Plan's funded status is projected to increase from 63% to 83% over the 10-year projection period, assuming all assumptions are exactly met.



SECTION I – BOARD SUMMARY

Projections with Asset Returns of 8.0%

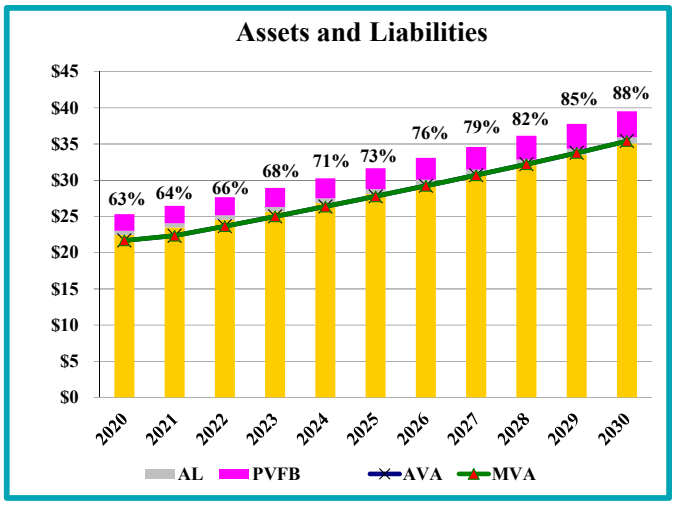


The Plan's investment earnings will affect the future funding status of the Plan. The two graphs on this page show what the next 10 years are expected to look like if the Plan's investment performance is 8.0% each year, 1.0% higher than the valuation investment rate of return assumption.

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

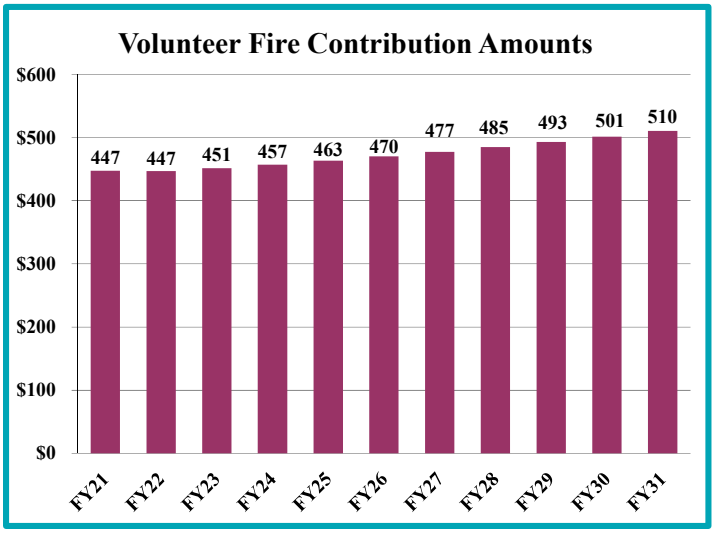
The "Volunteer Fire Contribution Amounts" graph shows that under this scenario, the employer ADC amount per head generally decreases during the 10-year period, to $423 per head instead of the $468 of the baseline scenario.

The "Assets and Liabilities" graph shows that under this scenario the Plan would reach an 88% funded ratio by 2030, an improvement over the baseline scenario's ultimate level of 83%.



SECTION I – BOARD SUMMARY

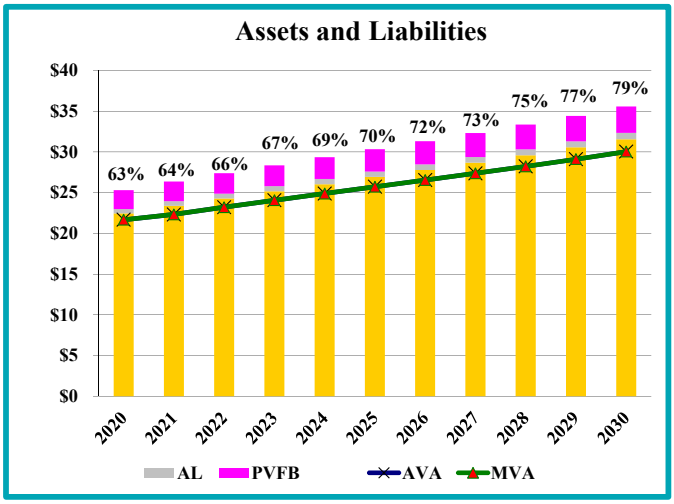
Projections with Asset Returns of 6.0%



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 amount increases more quickly than under the baseline scenario, reaching approximately $510 per head by the end of the 10-year projection period, significantly greater than the $468 per head ultimate amount in the baseline projection under this scenario. Additionally, the funded ratio is projected to also increase in this scenario, but at a slower pace with the emerging losses, reaching 79% at the end of the 10-year projection period, lower than the 83% ultimate ratio in the baseline scenario.



SECTION I – BOARD SUMMARY

Table I-1
Summary of Principal Plan Results

Valuation as of:	June 30, 2019	June 30, 2020	% Change
Member Counts			
Active Members	4,315	3,694	(14.39)%
Retirees and Beneficiaries	1,990	2,072	4.12%
Terminated Vested Members	186	545	193.01%
Terminated Non-Vested Members	16	27	68.75%
Total Member Counts	**6,507**	**6,338**	(2.60)%
Annual Benefit Payments for Retirees and Beneficiaries	$ 2,200,200	$ 2,317,900	5.35%
Assets and Liabilities			
Actuarial Liability (AL)	$ 35,471,900	$ 36,768,900	3.66%
Actuarial Value of Assets (AVA)	22,126,300	23,009,500	3.99%
Unfunded AL (UAL)	$ 13,345,600	$ 13,759,400	3.10%
Funded Ratio on AVA Basis (AVA/AL)	62.4%	62.6%	
Funded Ratio on MVA Basis (MVA/AL)	61.1%	60.7%	
Present Value of Accrued Benefits (PVAB)	$ 34,845,100	$ 35,895,900	3.02%
Market Value of Assets (MVA)	21,676,800	22,331,000	3.02%
Unfunded PVAB	$ 13,168,300	$ 13,564,900	3.01%
Accrued Benefit Funded Ratio (MVA/PVAB)	62.2%	62.2%	
Employer Contribution Amount	**Fiscal Year 2020**	**Fiscal Year 2021**	
Entry Age Normal Cost	$ 446,500	$ 388,200	
UAL Amortization Payment	1,416,500	1,460,500	
Administrative Expense	54,900	48,100	
Actuarially Determined Contribution (ADC)	$ 1,917,900	$ 1,896,800	
ADC per Active Member*	$ 444.47	$ 447.47	0.67%

* For FY 2021, the divisor was changed to use both actives and terminated vested members for developing the per-head rate to be more comparable to how this contribution is administered.

SECTION II – RISK DISCLOSURES

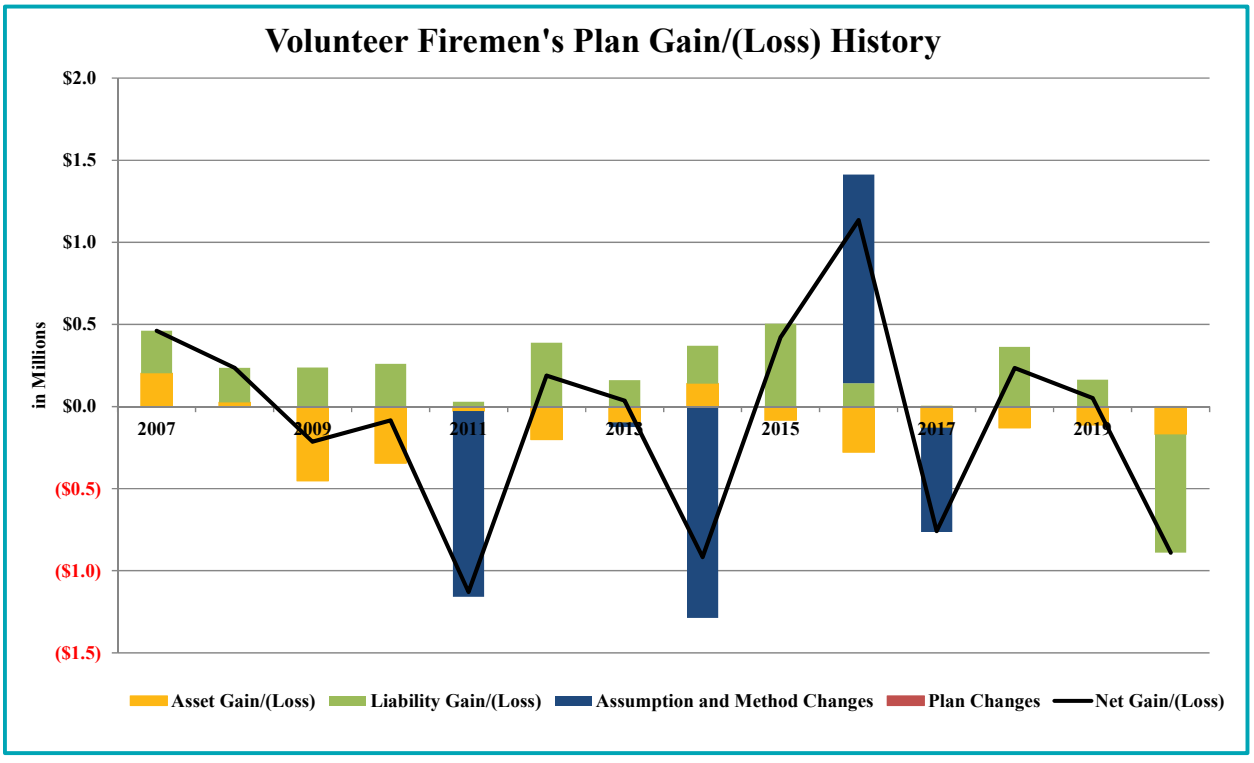
Introduction

The plan's actuarial valuation results are dependent on assumptions about future economic and demographic experience. Based on actuarial standards of practice, the assumptions represent a reasonable estimate for future experience. However, actual future experience will never conform exactly to the assumptions and may differ significantly from the assumptions. This deviation is the risk that pension plan sponsors undertake in relying on a pension plan's actuarial valuation results.

This section of this report is intended to identify the primary drivers of these risks, provide background information and assessments about these identified risks, and communicate the significance of these risks to this plan.

Historical Experience

For this plan, the two primary measurements where there is risk that the actual measurements will significantly differ from the expected future measurements are in the measurements of the liabilities of the Plan and the resulting calculation of the actuarially determined contributions. Therefore, while future experience will not be the same as past experience, it is useful to look at what factors have contributed to the actual liability measurements at each valuation date deviating from that which was predicted by the prior year's valuation. The following graph shows the gains/(losses) for each valuation date between the actual liability measurement and the expected liability broken down by cause.



SECTION II – RISK DISCLOSURES

This shows that the assumption and method changes gain/(loss) has been the most significant risk for the Plan over this period in regard to the actual liability measurements deviating from the expected. After that, the next two most significant causes are the liability gain/(loss) and the asset gain/(loss). Additionally, this graph shows that over the whole period shown the values for all three of these causes have somewhat offset each other. Over the whole period, liability gain/(loss) has had the greatest cumulative impact on the liability.

Risk Identification

Considering the specific characteristics of the Plan, the assumptions and methods used in the actuarial valuations for the Plan, and the recent history, we have identified the risks that we think are the most significant in terms of possibly leading to actual values of the measurements deviating from those expected by the valuation process, as follows:

- Investment risk,
- Longevity and other demographic risk, and
- Assumption change risk.

While we have identified these risks as potentially significant in regard to actual measurements deviating from expected, it is possible that there are other risks that we have not identified that will turn out to be significant. For example, while it is possible that the contributing employers could start paying contributions other than the actuarially determined contributions and the measurements thus differ as a result of contribution risk, we have not included contribution risk above as this Plan has consistently received contributions equal to what is assumed in the valuation process.

Investment Risk is the potential for investment returns to be different than anticipated. In the case of this Plan, that is the risk that the returns on assets will be materially different from the 7.0% that is currently assumed. If actual investment returns are lower than anticipated by the assumptions used in the actuarial valuation, this will increase the unfunded liability measurements and require higher contributions in the future than if the actual returns equaled the assumed returns. On the other hand, if the actual returns are higher than the assumption, the resulting unfunded liability measurements and actuarially determined contributions will be lower than anticipated. As seen in the historical section, this has been a significant driver of deviations in the actual measurements from those expected by prior valuations.

Longevity and Other Demographic Risk is the potential for mortality or other demographic experience to be different than expected. Generally, longevity and other demographic risks emerge slowly over time as the actual experience deviates from expected and is typically periodically reduced through the Plan's regular actuarial experience process. As such, these risks are often dwarfed by other risks, particularly those due to the investment returns. However, for small plans like this, there are relatively few members and so the behavior of individual members can have significant impact on the liabilities. In addition, this Plan is relatively young and so there has been limited information to develop the demographic assumptions on, which has

contributed to this risk. The historical section showed that this has been true for this Plan historically, with the magnitude of the gains and losses from liability experience being of even greater magnitude than those from investment experience, both cumulatively and in most years.

Assumption Change Risk is the potential for the environment to change such that future valuation assumptions are adjusted to be different than the current assumptions. For example, declines in interest rates resulting in changes in the assumed rates of return, changes in employee behavior and/or plan provisions requiring changes in the demographic assumptions, and similar. Assumption change risk is an extension of the risks previously identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in environment resulting in the current assumption no longer being reasonable. The historical review earlier in this section showed that assumption change risk has been a relatively significant risk for this plan over the recent historical period.

The revisions to the assumed rate of return from 8.0% to 7.5% in 2011, from 7.5% to 7.2% in 2014, and from 7.2% to 7.0% in 2017 constitute the majority of the increases to the unfunded measurements from the expected values as a result of assumption changes. Changes to the demographic assumptions to reflect mortality improvements have also had a relatively significant impact as have changes in the methodology of the funding policy throughout the years. Other changes to demographic assumptions have also resulted in deviations from the expected values, particularly the changes from the experience study reflected in the 2016 valuation.

It is important to note that these changes simply reflect recognizing changes in the expected values of assumptions. If these revisions had not been made, we would anticipate that these amounts would be gradually recognized in the other risks. If future expectations of assumptions, such as interest rates or mortality, change further, we anticipate similar amounts will have to be recognized.

Plan Maturity Measures

The future financial condition of a mature pension plan is more sensitive to each of the risks identified in the previous section than in a less mature plan. Before assessing the risks to the Plan from a forward-looking perspective, it is of value to understand the maturity of the Plan compared to other plans as well as how the Plan's maturity has changed over time.

Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic, the larger the plan is compared to the contribution or revenue base that supports it, the more sensitive the plan will be to risk. There are extensive measures available to assess plan maturity. For this plan, we have examined a number of these and all indicate that the Plan is maturing, but is less mature than most of its peers. We have included the most simplistic of these measures as a demonstration of this.

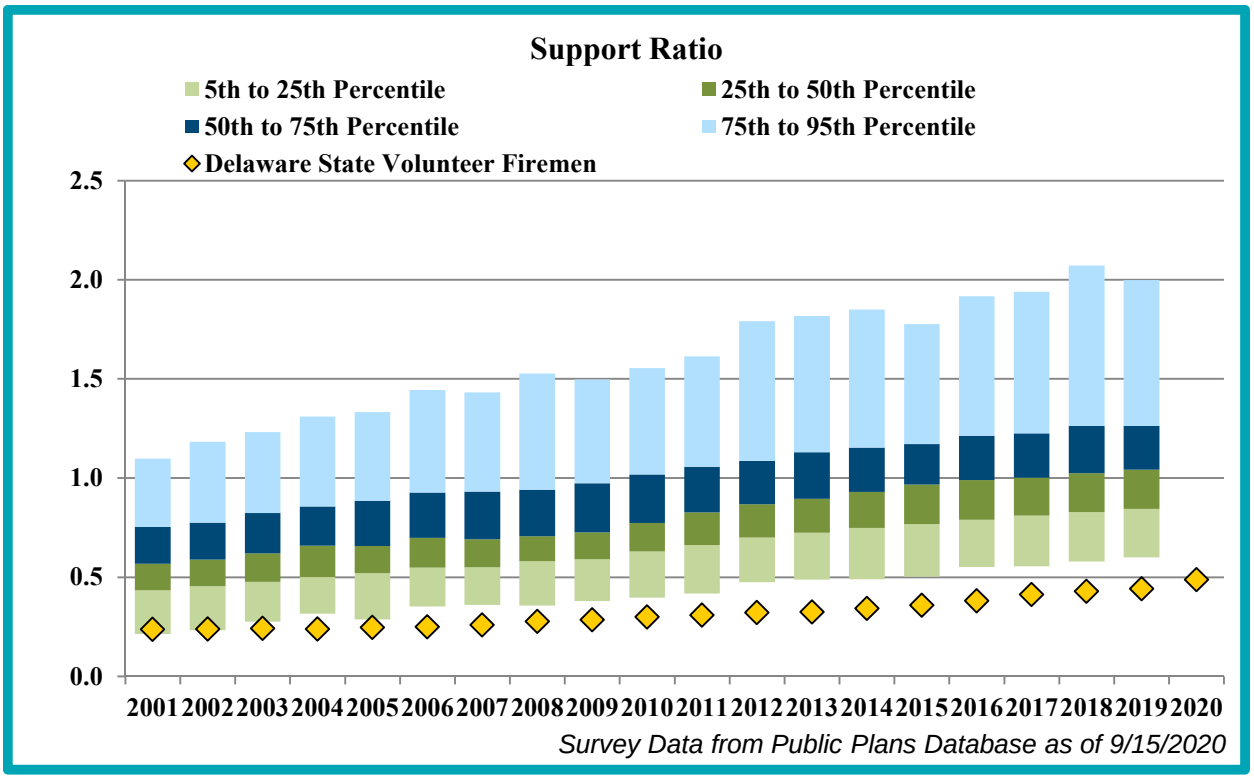
The most simplistic of the plan maturity measures is the support ratio, which is typically the ratio of the number of inactive members (those receiving benefits currently or entitled to a deferred

SECTION II – RISK DISCLOSURES

benefit) to the number of active members. In a typical plan, the contributions paid by the employers are only made on the basis of the actives, so they are the population that is supporting the remaining membership. However, for this plan, the employer contributions are made on the basis of the terminated vested members as well as the actives. As such, the support ratio we develop for this plan includes the terminated vested members with the actives instead of with the members whose benefits are in pay. The following graph shows the support ratio over time for the Plan versus a universe of other public plans.

The Boston College's Center for Retirement Research, NASRA and the Center for State and Local Government Excellence maintain the Public Plan Database that contains the majority of state plans as well as many large municipal plans, covering over 95% of the membership in public plans as well as over 95% of the assets held by public pension plans.

The chart that follows shows the support ratio for all plans in this database since 2001. The colored bars represent the central 90% of the support ratios for the plans in the database. Note that for these purposes, the support ratio calculated for the plans in the database is the traditional version where the terminated vested members are included with the in pay members in the ratio. The Delaware State Volunteer Firemen's Pension Plan is represented by the gold diamonds. For these gold diamonds, we have included the terminated vested members with the actives, consistent with how the Plan is funded. Note that this chart shows one more year for the System than the universe as the 2020 numbers are not yet available for the database.



SECTION II – RISK DISCLOSURES

This graph shows that the support ratio for the Plan has generally increased over time. This graph shows that Delaware Volunteer Fire's support ratio is much lower than a typical plan, indicating that the Plan is less mature based on this metric, and that over the recent history, the Plan's ratio has grown at a slower rate than typical plans in this universe through 2019. As of the most recent dates for which the full database is available, the Delaware Volunteer Fire's support ratio remains below the 5th percentile among all plans in the database.

More Detailed Assessment

A more detailed assessment is always valuable to enhance the understanding of the risks identified above, however the value of this must be compared alongside the costs of such an exercise. The costs in this case are both measureable costs as expressed by the actuarial fees for the additional assessment and the cost of staff time required to support the effort and more intangible costs such as the additional information potentially drowning out the principle findings from the valuation and overwhelming decision makers.

Whether or not to have a more detailed risk assessment performed at this time is the Board's decision, but we do not believe that this additional risk assessment is required at this time based on our understandings of the Board's priorities.

Conclusion

The results of this valuation are based on the assumptions and methodology used within the valuation and to the extent that actual experience deviates from these, the actual future measurements will deviate from those projected by this valuation. The most significant risks related to this are anticipated to be investment risk, mortality and other demographic risk, and assumption change risk.

SECTION III – 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, 2019 and June 30, 2020,
- Statement of the **changes** in market values during FY 2020,
- 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 III-1 below shows the market values as of June 30, 2019 and June 30, 2020, along with the changes between the two.

Table III-1
Changes in Market Values of Assets

Market Value of Assets – June 30, 2019		**$ 21,676,800**
Additions		
Member Contributions	$ 132,200	
Employer Contributions	1,919,300	
Investment Returns	1,133,700	
Total Additions	**$ 3,185,200**	
Deductions		
Benefit Payments	$ 2,482,900	
Administrative Expenses	48,100	
Total Deductions	**$ 2,531,000**	
Market Value of Assets – June 30, 2020		**$ 22,331,000**

SECTION III – 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, 2020.

Table III-2
Development of Actuarial Value of Assets

1.	Actuarial Value of Assets at June 30, 2019	$ 22,126,300
2.	Amount in (1) with interest to June 30, 2020 at 7.0% per year	23,675,100
3.	Employer and member contributions for FY 2020	2,051,500
4.	Interest on contributions assuming payments made uniformly throughout the year to June 30, 2020 at 7.0% per year	70,600
5.	Disbursements from Trust except investment expenses, July 1, 2019 through June 30, 2020	2,531,000
6.	Interest on disbursements to June 30, 2020 at 7.0% per year	87,100
7.	Expected Actuarial Value of Assets at June 30, 2020 = (2) + (3) + (4) – (5) – (6)	$ 23,179,100
8.	Actual Market Value of Assets at June 30, 2020	$ 22,331,000
9.	Excess of (8) over (7)	$ (848,100)
10.	Actuarial Value of Assets at June 30, 2020 = (7) + 20% of (9)	$ 23,009,500

SECTION III – ASSETS

Investment Performance

The market value of assets (MVA) returned 5.3% during 2020, less than the prior year's assumed 7.0% investment rate of return. The actuarial value of assets (AVA) returned 6.2% over this same year, reflecting the asset smoothing methodology being utilized by the Plan for the measurement of the AVA. 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 III-3
Cash Flow Projections

Year Beginning July 1,	Expected Benefit Payments	Expected Contributions*
2020	$ 2,455,000	$ 2,067,000
2021	2,522,000	2,045,000
2022	2,619,000	2,045,000
2023	2,688,000	2,045,000
2024	2,763,000	2,045,000
2025	2,843,000	2,045,000
2026	2,899,000	2,045,000
2027	2,949,000	2,045,000
2028	2,988,000	2,045,000
2029	3,023,000	2,045,000

* Expected contributions include employer contributions and member contributions. For illustration purposes, we have assumed the employer contribution rate will remain level at $447.47 from FYE 2021.

Expected benefit payments are projected for the closed group valued at June 30, 2020. 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 IV – 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, 2019 and June 30, 2020, 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. 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 IV – LIABILITIES

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

	June 30, 2019	June 30, 2020
Present Value of Benefits		
Active Member Benefits	$ 18,395,600	$ 13,973,900
Retiree, Beneficiary, and Terminated Member Benefits	21,274,300	26,477,400
Present Value of Benefits (PVB)	**$ 39,669,900**	**$ 40,451,300**
Market Value of Assets (MVA)	$ 21,676,800	$ 22,331,000
Future Member Contributions	1,284,000	1,120,000
Future Employer Contributions	16,709,100	17,000,300
Total Resources	**$ 39,669,900**	**$ 40,451,300**
Actuarial Liability		
Present Value of Benefits (PVB)	$ 39,669,900	$ 40,451,300
Present Value of Future Employer Normal Costs (PVFNC)	2,914,000	2,562,400
Present Value of Future Member Contributions (PVFEEC)	1,284,000	1,120,000
Actuarial Liability (AL=PVB–PVFNC–PVFEEC)	**$ 35,471,900**	**$ 36,768,900**
Actuarial Value of Assets (AVA)	22,126,300	23,009,500
Net (Surplus)/Unfunded AL (AL – AVA)	**$ 13,345,600**	**$ 13,759,400**
Present Value of Accrued Benefits		
Present Value of Benefits (PVB)	$ 39,669,900	$ 40,451,300
Present Value of Future Benefit Accruals (PVFBA)	4,824,800	4,555,400
Present Value of Accrued Benefits (PVAB=PVB–PVFBA)	**$ 34,845,100**	**$ 35,895,900**
Market Value of Assets (MVA)	$ 21,676,800	$ 22,331,000
Net (Surplus)/Unfunded PVAB (PVAB – MVA)	**$ 13,168,300**	**$ 13,564,900**

SECTION IV – 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 method

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 assets 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, in thousands.

Table IV-2
Liability Changes

(In Thousands)	Present Value of Benefits	Actuarial Liability	Present Value of Accrued Benefits
Liabilities June 30, 2019	$ 39,670	$ 35,472	$ 34,845
Liabilities June 30, 2020	40,451	36,769	35,896
Liability Increase/(Decrease)	781	1,297	1,051
Change Due to:			
Benefit Changes	0	0	0
Assumption Changes	0	0	0
Actuarial (Gain)/Loss	NC *	720	NC *
Benefits Accumulated and Other (Gain)/Loss	781	577	1,051

* NC = not calculated.

SECTION IV – LIABILITIES

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

Table IV-3
Actuarial Liabilities for Funding

	June 30, 2019	June 30, 2020
1. Actuarial Liabilities		
Retiree, Beneficiary, and Terminated Members	$ 21,274,300	$ 26,477,400
Active Members	14,197,600	10,291,500
Total Actuarial Liability (AL)	**$ 35,471,900**	**$ 36,768,900**
2. Actuarial Value of Assets (AVA)	$ 22,126,300	$ 23,009,500
3. Unfunded Actuarial Liability (UAL) [AL – AVA]	$ 13,345,600	$ 13,759,400

SECTION V – 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 projected future service. Then, this individual total normal cost rate is reduced by the member's contribution rate to produce the employer normal cost amount for each member. This employer normal cost amounts for all active members equals the sum of the employer normal cost amounts 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 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 over a 15-year closed period. The period was closed beginning with the 2020 valuation. Future gains and losses, beginning with the June 30, 2021 actuarial valuation, will be amortized over individual 15-year layers.

The current assumed administrative expense is equal to the actual administrative expenses charged in the prior year. This amount 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 amounts for the Plan based on this funding valuation and the immediately prior one.

Table V-1
Employer Contribution Amounts

Valuation Date	**June 30, 2019**	**June 30, 2020**
FY Contribution Amount Payable	**FY 2020**	**FY 2021**
Entry Age Normal Cost Amount	$ 446,500	$ 388,200
UAL Amortization Payment Amount	1,416,500	1,460,500
Administrative Expense Amount	54,900	48,100
Actuarially Determined Contribution	$ 1,917,900	$ 1,896,800

SECTION V – CONTRIBUTIONS

Table V-2 below provides additional detail about the development of the expected employer contribution amount for FY 2021.

Table V-2
Expected FY 2021
Employer Contributions

	In Dollars
1. Present Value of Projected Benefits Attributable to:	
a. Total Normal Cost	$ 501,200
b. Expected Member Contributions	113,000
c. Employer-Paid Normal Cost (a) – (b)	$ 388,200
2. Amortization of Unfunded Liability	1,460,500
3. Allowance for Administrative Expense	48,100
4. Total Employer Actuarially Determined Contribution Amount (1) + (2) + (3)	$ 1,896,800

SECTION VI – 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, 2019 and June 30, 2020 are provided for informational purposes and are exhibited in Table VI-1 which also includes a reconciliation of liabilities determined as of the prior valuation, July 1, 2019, to the liabilities as of June 30, 2020. These values are based on the funding liability results with level percentage of payroll used as discussed later in this section.

This valuation contains information reported in the June 30, 2020 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 2019 funding valuation results. The calculation of Net Pension Liability in Table VI-2 shows the amounts to be disclosed for FY 2020, based on the liabilities of the roll forward of the 2019 funding valuation, as well as a projection of the anticipated FY 2021 disclosures, based on liabilities from the 2020 funding valuation, assuming all actuarial assumptions are met over the coming year. The actual disclosures for FY 2021 will be developed once the asset measure for GASB as of June 30, 2021 is known.

Tables VI-3 through VI-5 are exhibits to be used for the System's CAFR. Table VI-3 is the Note to Required Supplementary Information, Table VI-4 is a history of gains and losses in accrued liability, and Table VI-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 is 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 contributions 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 employer's CAFR.

SECTION VI – ACCOUNTING STATEMENT INFORMATION

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

	June 30, 2019	June 30, 2020
FASB ASC Topic No. 960 Basis		
1. Present Value of Accrued Benefits (PVAB)		
a. Members Currently Receiving Payments	$ 19,390,700	$ 20,455,500
b. Former Vested Members	1,883,600	6,021,900
c. Active Members	13,570,800	9,418,500
2. Total PVAB [1(a) + 1(b) + 1(c)]	$ 34,845,100	$ 35,895,900
3. Market Value of Assets (MVA)	21,676,800	22,331,000
4. Unfunded PVAB [2 – 3]	$ 13,168,300	$ 13,564,900
5. Ratio of Market Value of Assets to Present Value of Benefits [3 / 2]	62.2%	62.2%
Reconciliation of PVAB		
PVAB at June 30, 2019		$ 34,845,100
Increase/(Decrease) During Year Attributable to:		
Passage of Time		2,353,700
Benefits Paid – FY 2020		(2,482,900)
Benefit Changes		0
Assumption Changes		0
Benefits Accrued, Other Gains/Losses		1,180,000
Net Increase/(Decrease)		1,050,800
PVAB at June 30, 2020		$ 35,895,900

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-2
GASB Number 67 Disclosures

	June 30, 2020	Estimated June 30, 2021
Total Pension Liability (TPL)		
Service cost	$ 717,000	$ 603,000
Interest	2,379,000	2,477,000
Changes in benefit terms	0	0
Differences between expected and actual experience	(97,000)	891,000
Changes in assumptions	0	0
Benefit payments, including refunds of member contributions	(2,483,000)	(2,455,000)
Net change in TPL	**$ 516,000**	**$ 1,516,000**
TPL – beginning	**$ 34,582,000**	**$ 35,098,000**
TPL - ending (a)	**$ 35,098,000**	**$ 36,614,000**
Fiduciary Net Position (FNP)		
Contributions - Employer	$ 1,919,000	$ 1,897,000
Contributions - Non-employer	0	0
Contributions - Member	132,000	170,000
Net investment income	1,134,000	1,548,000
Benefit payments, including refunds of member contributions	(2,483,000)	(2,455,000)
Administrative expenses	(48,000)	(54,000)
Net change in FNP	**$ 654,000**	**$ 1,106,000**
FNP - beginning	**$ 21,677,000**	**$ 22,331,000**
FNP - ending (b)	**$ 22,331,000**	**$ 23,437,000**
Net Pension Liability/(Asset) - ending [(a)-(b)]	**$ 12,767,000**	**$ 13,177,000**

Items printed in red will be replaced with actual amounts once known at the end of FY 2021.

Note that GASB Statement No. 67 requires that the level percentage of payroll version of Entry Age Normal calculations be used, even when benefits are not related to salary. As such, the liability calculations shown in these accounting exhibits are based on a level percentage of payroll methodology with the percentage being the assumed inflation rate, 2.5% for this valuation. For this reason, the figures shown for the GASB No. 67 disclosures above will not agree with those shown elsewhere in this report relating to funding.

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-3
Note to Required Supplementary Information

The June 30, 2020 total pension liability presented in Table VI-2 was determined as part of the measurement at the date indicated. Additional information as of the latest measurement date follows:

Measurement date:	July 1, 2020
Valuation date:	July 1, 2019
Actuarial cost method:	Entry age normal
Actuarial cost method:	Entry age normal with level % of pay using inflation as the rate of pay increase
Actuarial assumptions:	
Investment rate of return*	7.0%
Projected salary increases*	N/A
Cost-of-living adjustments	ad hoc
* Includes inflation at	2.50%

The actuarially determined contribution for fiscal year 2021 will use the contribution rate developed in section V of this valuation. It was determined using the measurement date and key assumptions that follow:

Measurement date:	July 1, 2020
Valuation date:	July 1, 2020
Actuarial cost method:	Entry age normal level dollar
Amortization method:	Level dollar closed as of June 30, 2020
Amortization period:	15 years
Asset valuation method:	Smoothed market, 20% annual market weight
Actuarial assumptions:	
Investment rate of return*	7.0%
Projected salary increases*	N/A
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'

The total amount of employer contributions to the Plan is composed of the employer normal cost, the unfunded actuarial liability amortization payment, and the administrative expenses. The employer normal cost is a level dollar amount 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.

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-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	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Investment Income on Actuarial Assets	$ (83)	$ (278)	$ (130)	$ (129)	$ (112)	$ (170)
Combined Liability Experience	505	142	6	364	163	(720)
(Loss)/Gain during Year from Financial Experience	$ 422	$ (136)	$ (124)	$ 235	$ 51	$ (890)
Non-Recurring Items	0	1,271	(634)	0	0	0
Composite Gain (or Loss) during Year	$ 422	$ 1,135	$ (758)	$ 235	$ 51	$ (890)

Table VI-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)
2020	$ 3,756	$ 20,456	$ 12,557	$ 23,010	100%	94%	0%
2019	5,283	19,391	10,798	22,126	100	87	0
2018	5,207	18,835	10,779	21,047	100	84	0
2017	5,302	18,326	10,713	19,911	100	80	0
2016	5,268	17,169	10,520	18,773	100	79	0
2015	5,282	15,850	12,507	18,002	100	80	0

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Volunteer Firemen's Pension Plan
Data Reconciliation

	A	P-TDV	P-SUPP	P-RET	P-DIS	P-SR	P-SURV	Total
1. June 30, 2019 valuation	**4,315**	**179**	**7**	**1,990**	**0**	**0**	**0**	**6,491**
2. Additions								
(a) New entrants	142	4		6				152
(b) New Beneficiary/QDRO								
(c) Total	142	4		6				152
3. Reductions								
(a) Terminated - not vested	(255)							(255)
(b) Paid Out/Expired/Death		(4)		(73)				(77)
(c) Total	(255)	(4)		(73)				(332)
4. Changes in status								
(a) P-TDV	(382)	384	(1)	(1)				
(b) P-SUPP								
(c) Returned to work								
(d) P-RET	(126)	(24)		150				
(e) PRET25								
(f) P-DIS								
(g) P-LTD								
(h) P-SURV								
(i) PSUR25								
(j) P-SR								
(k) Data corrections								
(l) Total	(508)	360	(1)	149				
5. June 30, 2020 valuation	**3,694**	**539**	**6**	**2,072**	**0**	**0**	**0**	**6,311**

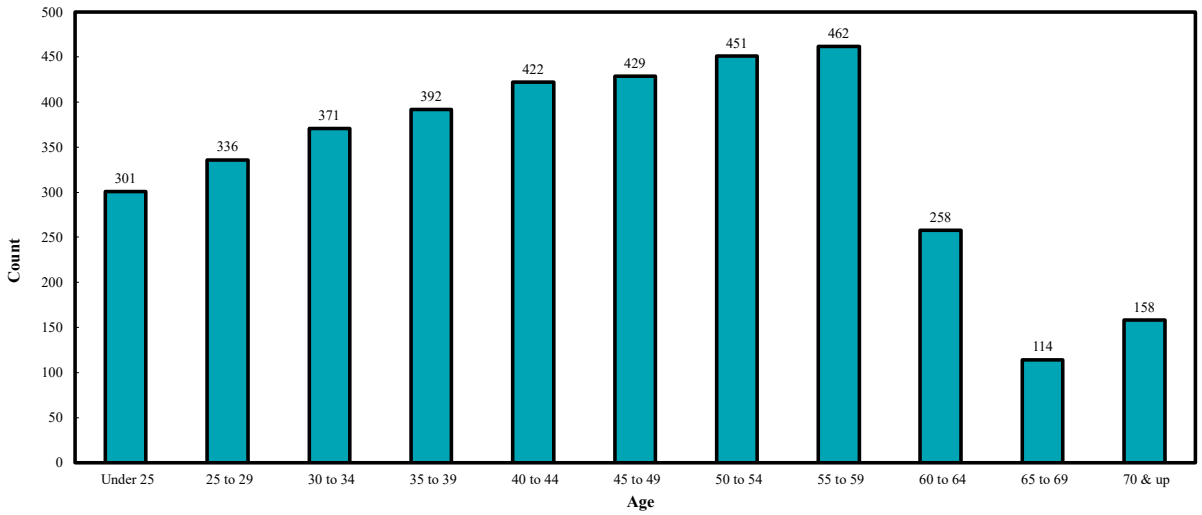
A=Active, P-TDV=Terminated Deferred Vested, P-SUPP=Terminated Deferred Vested, P-RET=Retired, PRET25=Retired, P-DIS=Disabled, P-LTD=Long-Term Disabled, P-SURV=Surviving Beneficiary, PSUR25=Surviving Beneficiary, P-SR=Disabled

APPENDIX A – MEMBERSHIP INFORMATION

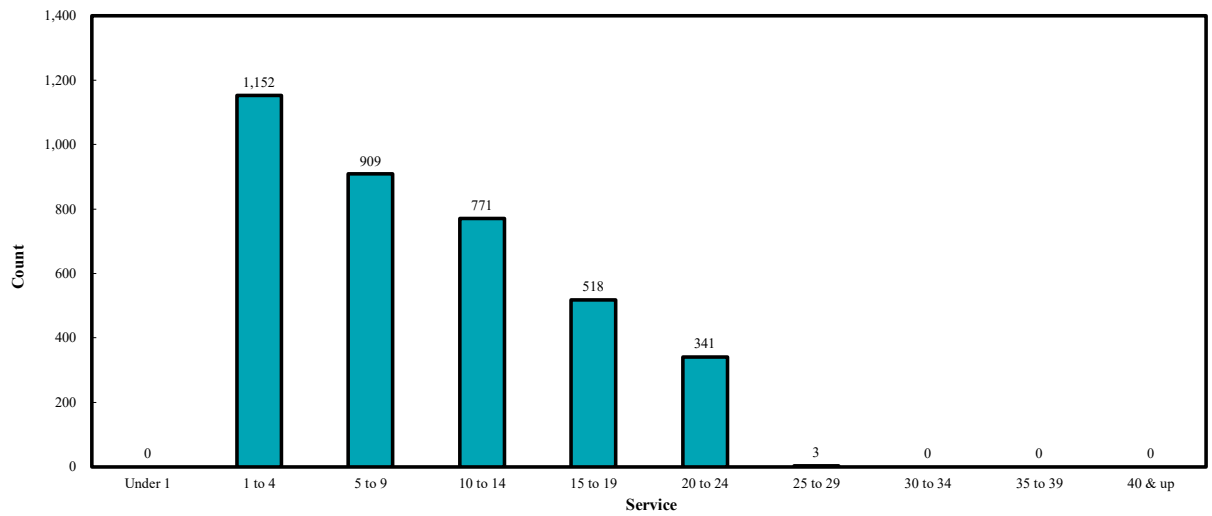
Delaware State Volunteer Firemen's Pension Plan Distribution of Active Members by Age and Service as of June 30, 2020											
Counts By Age/Service											
	Service										
Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	**Total**
Under 25	0	242	59	0	0	0	0	0	0	0	301
25 to 29	0	155	132	49	0	0	0	0	0	0	336
30 to 34	0	130	110	96	35	0	0	0	0	0	371
35 to 39	0	102	91	101	70	28	0	0	0	0	392
40 to 44	0	89	80	101	86	66	0	0	0	0	422
45 to 49	0	105	66	102	93	63	0	0	0	0	429
50 to 54	0	90	80	109	99	70	3	0	0	0	451
55 to 59	0	80	92	123	89	78	0	0	0	0	462
60 to 64	0	62	76	57	36	27	0	0	0	0	258
65 to 69	0	42	51	13	4	4	0	0	0	0	114
70 & up	0	55	72	20	6	5	0	0	0	0	158
Total	0	1,152	909	771	518	341	3	0	0	0	3,694

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Volunteer Firemen's Pension Plan Distribution of Active Members by Age as of June 30, 2020



Delaware State Volunteer Firemen's Pension Plan Distribution of Active Members by Service as of June 30, 2020



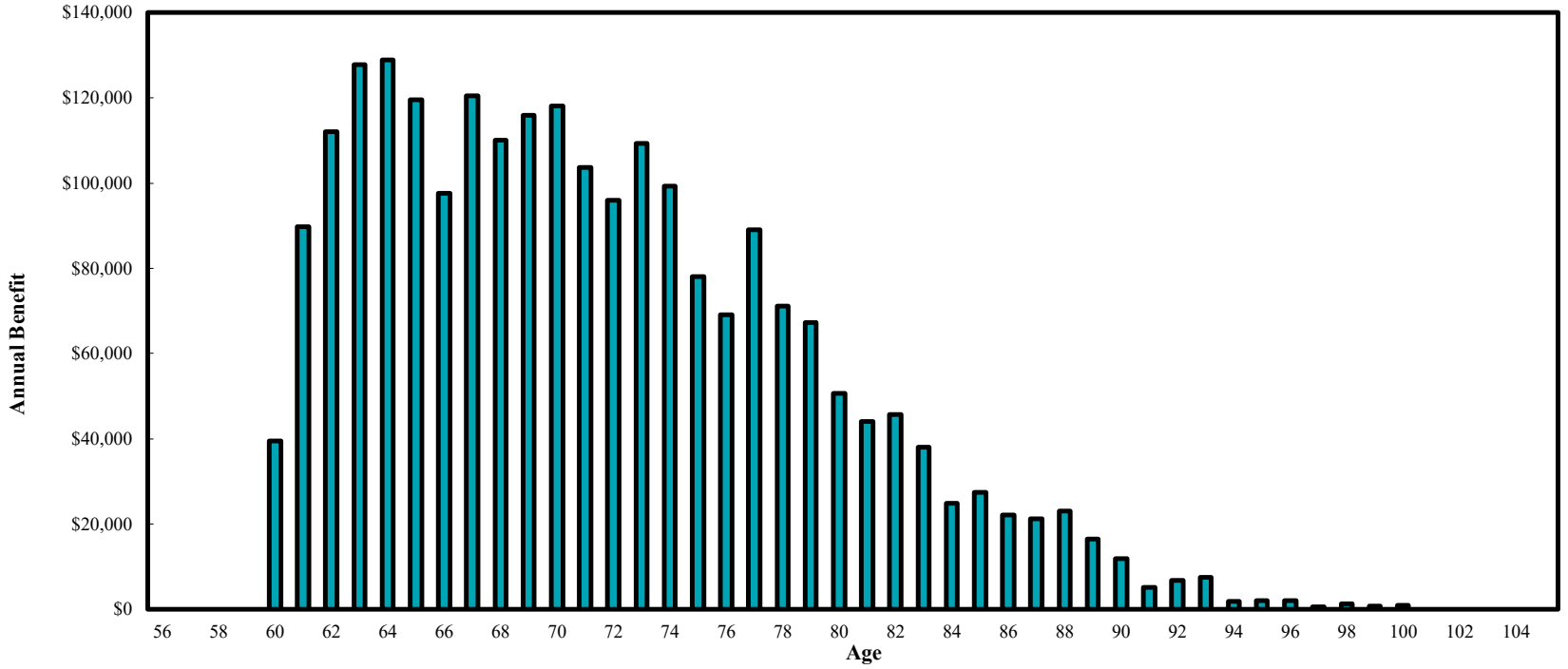
APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Volunteer Firemen's Pension Plan Annual Benefit Distribution of Retired Members and Beneficiaries as of June 30, 2020

Age	Count	Annual Benefit
<25	0	$0
25	0	$0
26	0	$0
27	0	$0
28	0	$0
29	0	$0
30	0	$0
31	0	$0
32	0	$0
33	0	$0
34	0	$0
35	0	$0
36	0	$0
37	0	$0
38	0	$0
39	0	$0
40	0	$0
41	0	$0
42	0	$0
43	0	$0
44	0	$0
45	0	$0
46	0	$0
47	0	$0
48	0	$0
49	0	$0
50	0	$0
51	0	$0
52	0	$0
53	0	$0
54	0	$0
55	0	$0
56	0	$0
57	0	$0
58	0	$0
59	0	$0
60	30	$39,540
61	67	$89,700
62	86	$112,020
63	102	$127,860
64	99	$128,940
65	101	$119,640
66	83	$97,560
67	98	$120,540
68	97	$110,040
69	102	$115,920
70	98	$118,200
71	88	$103,680
72	89	$96,000
73	98	$109,380
74	88	$99,240
75	70	$78,000
76	64	$69,180
77	78	$88,980
78	65	$71,160
79	65	$67,320
80	50	$50,700
81	47	$44,040
82	51	$45,720
83	39	$37,980
84	27	$24,900
85	31	$27,420
86	26	$22,200
87	26	$21,240
88	28	$23,040
89	22	$16,500
90	16	$11,940
91	7	$5,220
92	10	$6,900
93	10	$7,560
94	3	$1,860
95	3	$1,980
96	3	$2,040
97	1	$600
98	2	$1,380
99	1	$840
100	1	$900
101	0	$0
102	0	$0
103	0	$0
104	0	$0
105	0	$0
106	0	$0
107	0	$0
108	0	$0
109	0	$0
110	0	$0
111	0	$0
112	0	$0
113	0	$0
114	0	$0
115	0	$0
116	0	$0
117	0	$0
118	0	$0
119	0	$0
120	0	$0
Totals	2,072	$2,317,860

APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Volunteer Firemen's Pension Plan Annual Benefit Distribution of Retired Members and Beneficiaries as of June 30, 2020



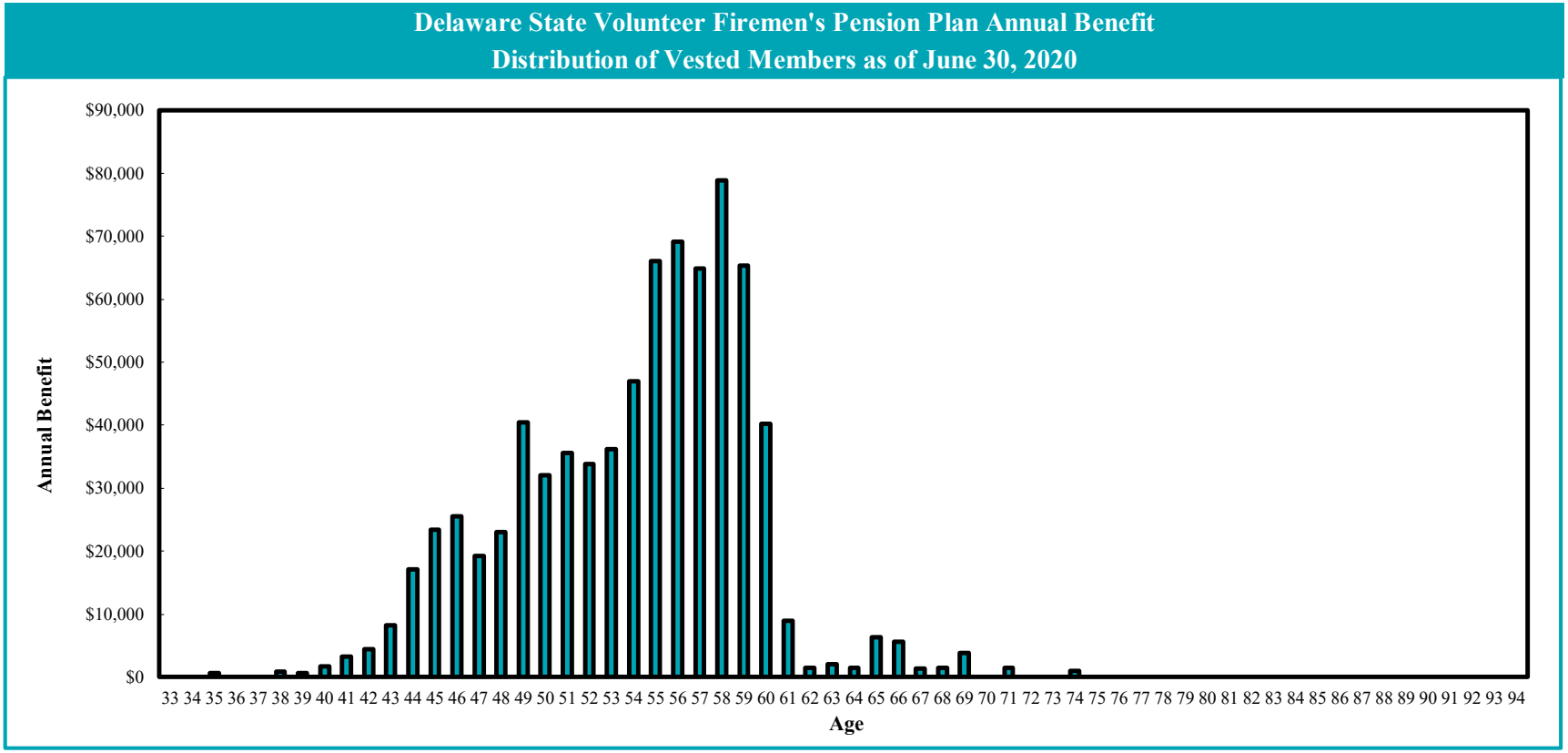
APPENDIX A – MEMBERSHIP INFORMATION

Delaware State Volunteer Firemen's Pension Plan Annual Benefit Distribution of Vested Members as of June 30, 2020

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	$0	73	0	$0
25	0	$0	74	1	$960
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	1	$600	84	0	$0
36	0	$0	85	0	$0
37	0	$0	86	0	$0
38	1	$840	87	0	$0
39	1	$600	88	0	$0
40	2	$1,680	89	0	$0
41	3	$3,300	90	0	$0
42	3	$4,500	91	0	$0
43	6	$8,280	92	0	$0
44	12	$17,100	93	0	$0
45	16	$23,460	94	0	$0
46	18	$25,560	95	0	$0
47	14	$19,260	96	0	$0
48	17	$23,100	97	0	$0
49	28	$40,440	98	0	$0
50	23	$32,100	99	0	$0
51	25	$35,580	100	0	$0
52	23	$33,780	101	0	$0
53	25	$36,240	102	0	$0
54	33	$46,980	103	0	$0
55	46	$66,120	104	0	$0
56	47	$69,120	105	0	$0
57	46	$64,920	106	0	$0
58	54	$78,900	107	0	$0
59	45	$65,340	108	0	$0
60	29	$40,260	109	0	$0
61	6	$9,000	110	0	$0
62	1	$1,500	111	0	$0
63	2	$2,040	112	0	$0
64	1	$1,500	113	0	$0
65	5	$6,360	114	0	$0
66	4	$5,580	115	0	$0
67	1	$1,380	116	0	$0
68	1	$1,500	117	0	$0
69	3	$3,840	118	0	$0
70	0	$0	119	0	$0
71	2	$1,500	120	0	$0
72	0	$0			
			Totals	545	$773,220

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

APPENDIX A – MEMBERSHIP INFORMATION



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 and healthy 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):

(2020 Values Shown)		
Age	Male	Female
25	5	2
30	4	2
35	5	3
40	6	4
45	10	6
50	17	10
55	29	16
60	49	24
65	87	36
70	148	61
75	251	106
80	425	183

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):

(2020 Values Shown)		
Age	Male	Female
50	42	26
55	60	35
60	81	51
65	115	78
70	179	125
75	291	206
80	490	348
85	855	617
90	1,524	1,116
95	2,431	1,856
100	3,482	2,782

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 the 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.

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

Rates of Termination	
Service	Rates
0-3	7.0%
4-5	6.0
6	5.0
7	4.0
8	3.0
9	9.0
10-25	1.0
26+	0.0

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

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

c. Rates of Retirement

Normal Retirement: eligible upon attaining age 60 with completion of 10 years of service

Rates of Retirement*	
Service	Rates
<60	0.0%
60	60.0
61-64	30.0
65-67	25.0
68-79	20.0
80+	100.0

* Rates only applicable if member meets eligibility.

d. Salary Increase Rates

Not applicable. Salary is not a component of this Plan.

e. Service Accrual Assumption

2/3 of active members will accrue additional service and make member contributions.

2. Economic Assumptions

a. Investment Rate of Return: 7.00%
b. General Wage Increase Rate: N/A
c. Annual Assumed Cost-of-Living Increase Rate for Retirees: 0.00%
d. Total Payroll Increase Rate (for Amortization): N/A
e. Administrative Expenses: Assume following year's expense will equal allocation of administrative expenses made in the prior year. Projections assume 3% increases.

3. Technical and Miscellaneous Assumptions

a. Decrement timing: Middle of year

4. Disclosures Regarding Models Used

In accordance with Actuarial Standard of Practice (ASOP) No. 56 *Modeling*, the following disclosures are made:

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

a. Valuation Software

Cheiron utilizes ProVal, an actuarial valuation software program leased from Winklevoss Technologies (WinTech), to calculate liabilities and projected benefit payments. We have reviewed the underlying workings of this model to the degree feasible and consistent with ASOP No. 56 and believe them to be appropriate for the purposes of the valuation.

b. Projections

This valuation report includes projections of future contributions and funded status for the purpose of assisting the Board of Trustees and the sponsors of the Plan with the management of the Plan.

The projections are based on the same census data and financial information as of June 30, 2020 as disclosed in this actuarial valuation. The projections assume continuation of the plan provisions and actuarial assumptions in effect as of June 30, 2020 and do not reflect the impact of any changes in benefits or actuarial assumptions that may be adopted after June 30, 2020.

The projections assume that all future assumptions are met except where specifically indicated. The future outcomes become increasingly uncertain over time, and therefore the general trends and not the absolute values should be considered in the review of these projections. Further, for the purpose of these projections, we have only reflected the impact of new entrants entering the plan in aggregate and have not developed individual liabilities or detailed profiles related to these potential new entrants. We feel this is appropriate for the purpose of these projections, but if they were to be used for other purposes, this may not be appropriate and alternative projections may need to be developed.

5. 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.

6. 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 is determined as the level dollar amount for each active member. The normal cost plus member contributions will pay for projected benefits at retirement for each active plan participant. Member contributions are assumed to be made by two-thirds of the active population in each year.

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 is amortized as a level dollar amount over individual 15-year periods. The unfunded liability was being amortized by annual payments over a 40-year period from July 1, 1987 until July 1, 2013, at which time the funding method was moved to a 15-year open period. This rolling 15-year period continued until July 1, 2020, when the method was changed to individual closed 15-year layers for periods beginning July 1, 2020. This method was chosen to provide more level contributions over time while ensuring that the UAL being paid off in a reasonable period of time.

For purposes of the GASB 67 disclosures, the Entry Age Normal funding method assuming a level percentage of pay is used. For this method, the pay increase assumption is the underlying inflation rate of 2.50%.

2. Actuarial Value of Assets

For purposes of determining the employer contribution rate to the Plan, we use an actuarial value of assets. The 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

Amortization period for future years was changed from an open fifteen-year period to individual closed fifteen-year layers.

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 actively participating volunteers of one of the State volunteer fire departments, ladies auxiliaries, and service organizations providing volunteer ambulance services.

2. Member Contributions

$60.00 per member per year
Interest is credited at the rate of 5% per year.

3. Credited Service

Service prior to July 1, 1986: one year of service for each three years of service

Service after June 30, 1986: all service as a volunteer as certified by a fire company

4. Normal Retirement

Eligibility: Age 60 with 10 years of credited service

Benefit: $5.00 per year of credited service, to a maximum of $125.00 per month

5. Survivor's Benefit

Eligibility: Death of a member, inactive member, or retired member

Benefit: Lump sum equal to the excess, if any, of the accumulated member contributions with interest over the total pension payments made, if any

6. Vesting

Eligibility: 10 years of credited service

Benefit: Normal retirement benefit payable at age 60 based on service at date of termination. In lieu of a pension, a member may receive a refund of accumulated employee contributions with interest. Upon application for a refund of contributions, a member's vested right to a monthly benefit shall be forfeited.

APPENDIX C – SUMMARY OF PLAN PROVISIONS

7. Form of Payment

The normal form of payment is a single life annuity with a guarantee that at least member contributions will be paid out.

8. Changes Since Last Valuation

None