CHEIRON

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Delaware County & Municipal Employees' 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 County & Municipal Employees' 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 employer contributions for Fiscal Year (FY) 2022 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: plan 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 County & Municipal 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.

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.

Cheiron

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Principal Consulting Actuary

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Consulting Actuary

FOREWORD

Cheiron has performed the annual actuarial valuation of the Delaware County & Municipal Employees' 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 rate** to be paid by the participating employers for Fiscal Year (FY) 2022, 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 2022 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) rate was calculated to decrease from 7.06% for FY 2021 to 6.78% for FY 2022.

During the year ended June 30, 2020, the Plan's assets earned 9.9% on a market value basis. However, due to the Plan's asset smoothing method, which recognizes portions of the investment gains and losses over time, the return on an actuarial value basis was 7.4%. This return was more than the assumed investment rate of return of 7.0% for the prior year, resulting in an actuarial gain on investments of $0.24 million.

The Plan experienced an actuarial gain on Plan liabilities resulting from salary increases different from those assumed and members retiring, terminating, becoming disabled, and dying at rates different from the actuarial assumptions. This liability gain decreased the actuarial liability by $0.36 million. This type of gain or loss is normal in the course of plan experience, as we cannot predict exactly how people will behave. There was also an increase in the actuarial liability of $4,100 due to a new group joining with partial past service. There was no impact on the Plan's unfunded liability for this group joining though since this amount was also contributed to the Plan by the new employer as an additional contribution.

In addition, the calculation of the final average compensation used in developing benefits for actives and terminated vested members was updated to include an average from previous years, newly provided in the data this year. This value is used if it is higher than the average projected based on the current year salary information. This assumption change increased the liabilities by $0.2 million.

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 updated 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. 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 funding actuarial valuation liability results.

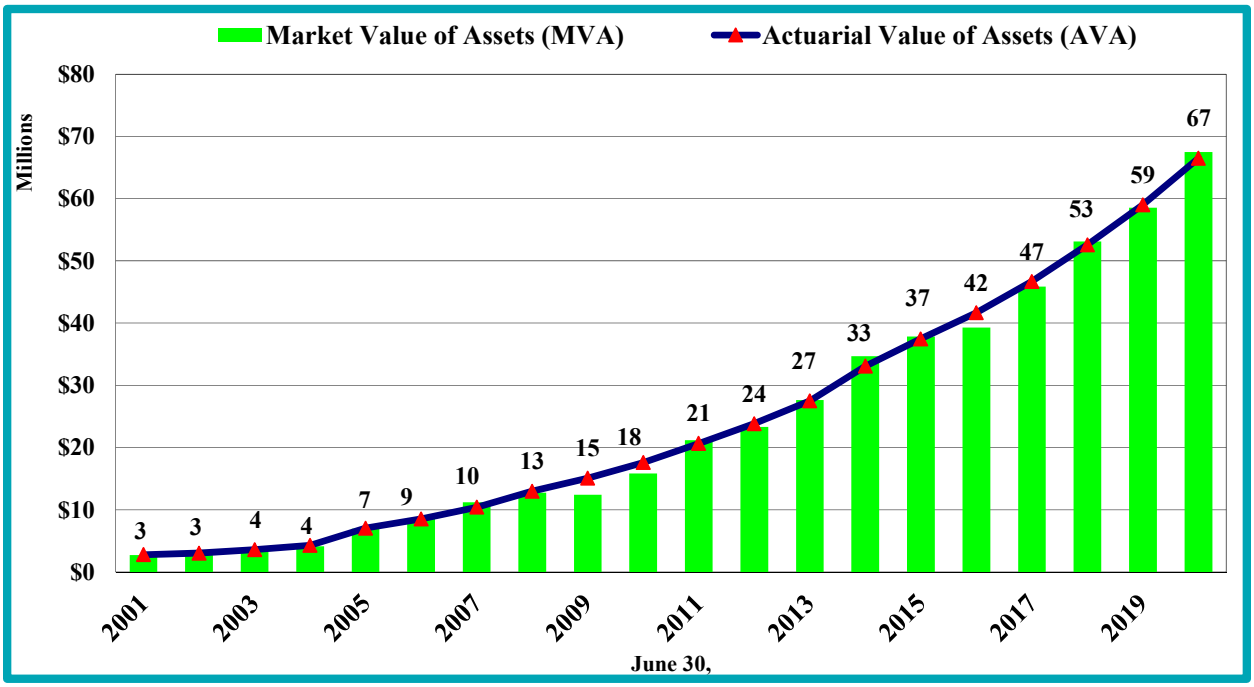
As of the June 30, 2020 funding actuarial valuation, the Plan's unfunded actuarial liability (UAL) was $2.9 million. This is a decrease from the $3.8 million UAL in the funding valuation for the prior year.

SECTION I – BOARD SUMMARY

Trends

Assets 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 9.9% over the last year. The determination of the Plan's actuarial value of assets (AVA) for the current year reflects a portion of the return above the 7.0% assumed for the prior year, and continued recognition of prior years' gains and losses, with the combined effect of returning 7.4% 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 7.2%, compared to the current valuation assumption of 7.0%. On a market value of assets basis, the Plan returned 6.9% over the same period.

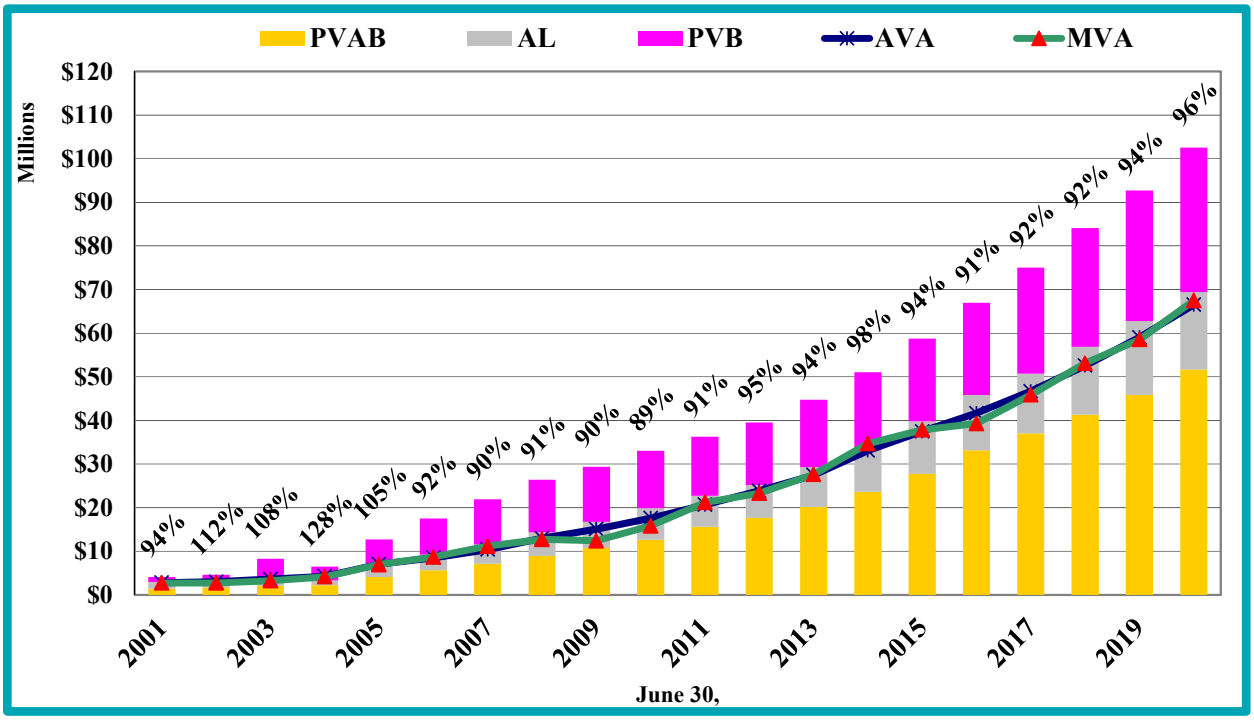
SECTION I – BOARD SUMMARY

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 dates.

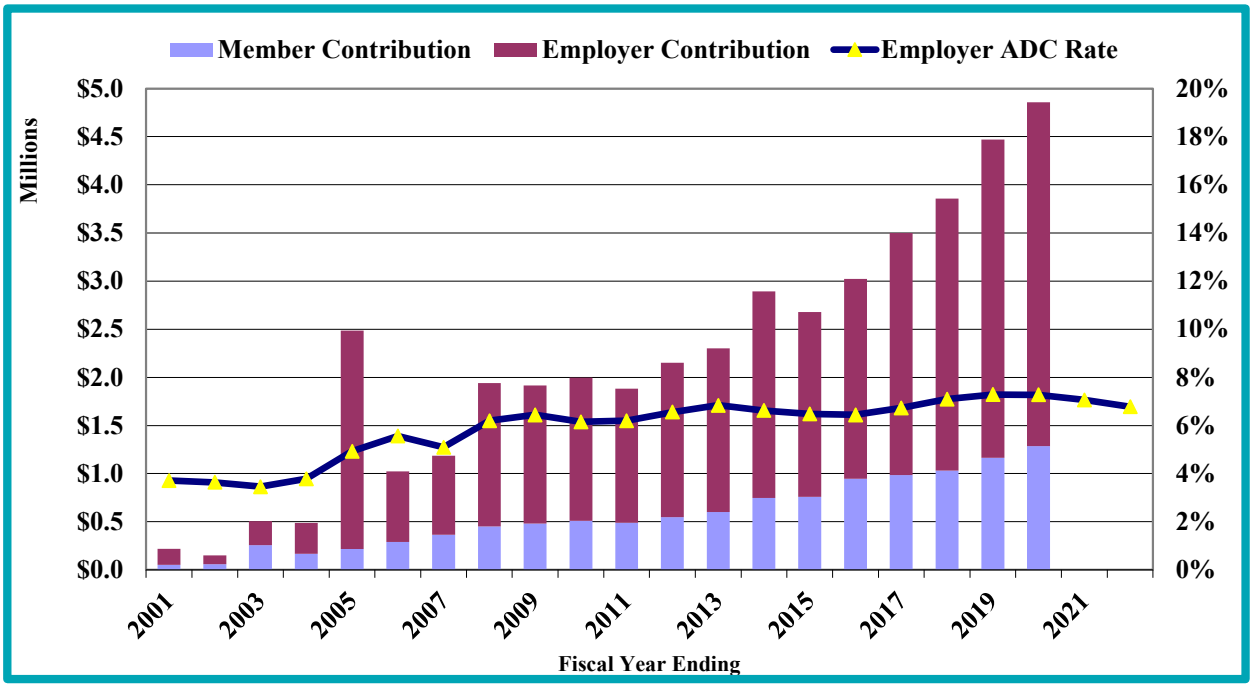
The second liability measure shown is the one currently used for the Plan's funding target, the actuarial liability (AL). These target amounts are represented by the top of the gray bars. This measurement is also the basis of the liability measure used in GASB 67. The funded ratios reported by the Plan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

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



SECTION I – BOARD SUMMARY

Contribution Rates



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

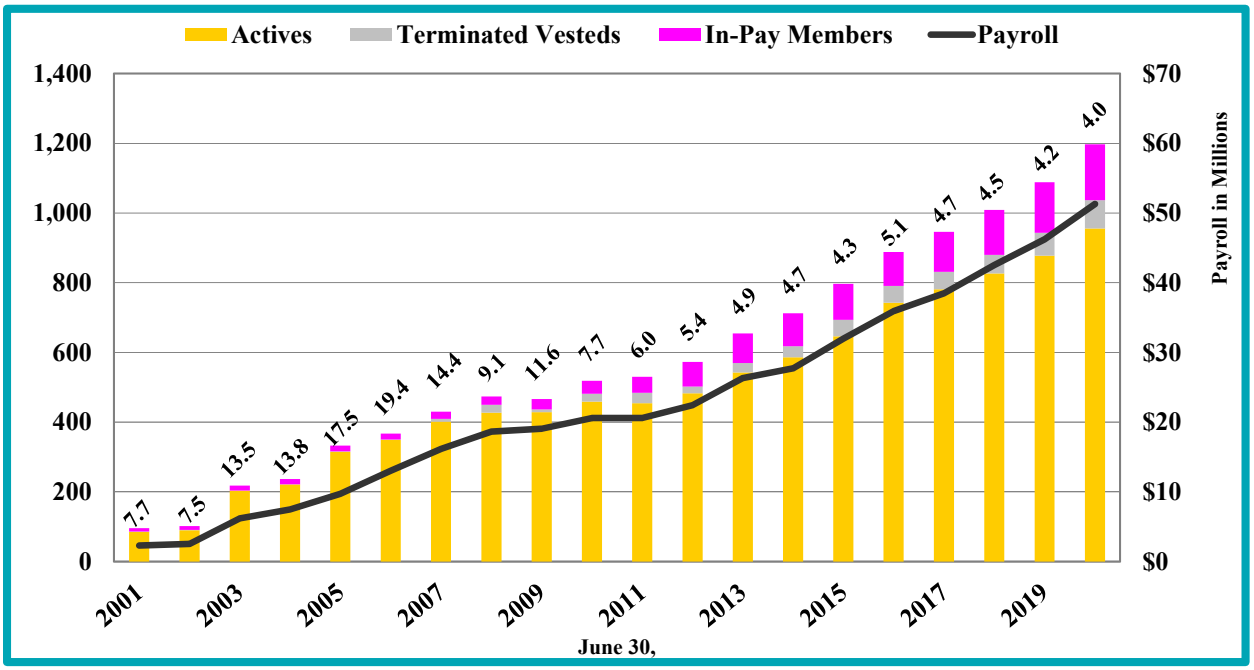
The member contribution rate is set by State law, based on the plan in which the member participates. The participating employer contribution rate is set by the actuarial process. Please note that there is a lag between the calculation of the State contribution rates and when they are payable. For example, the value shown for the FY 2020 is the rate prepared by the June 30, 2018 valuation and implemented for the period July 1, 2019 to June 30, 2020. As such, there are two more years of rates shown beyond the years of actual contributions.

SECTION I – BOARD SUMMARY

Participant Trends

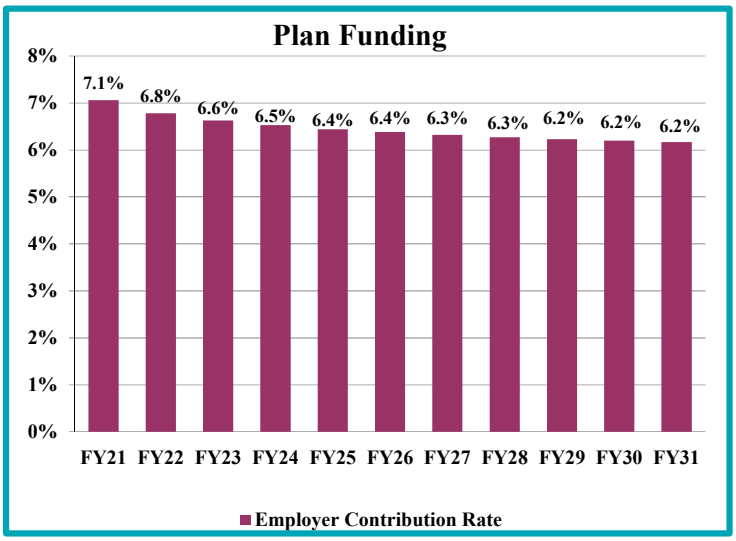
The bars below show the number of members as of each valuation date, divided between active members, terminated vested members, and retirees/beneficiaries. These bars are read using the left-hand scale. Since this is a relatively young plan, there are still far more active members than inactive members. However, as this plan continues to mature, this plan will continue to show growth in the number of inactive members. The numbers that appear above each bar represent the ratio of active members to inactive members (retirees, beneficiaries, and terminated vested members) at each valuation date. The active-to-inactive ratio has decreased from 7.7 actives for each inactive in 2001 to 4.0 actives for each inactive in 2020.

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



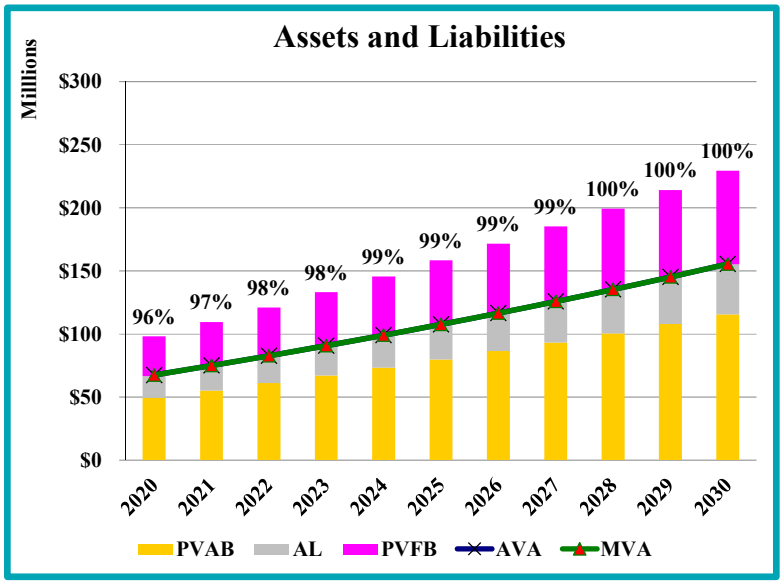
Future Outlook

Baseline Projections



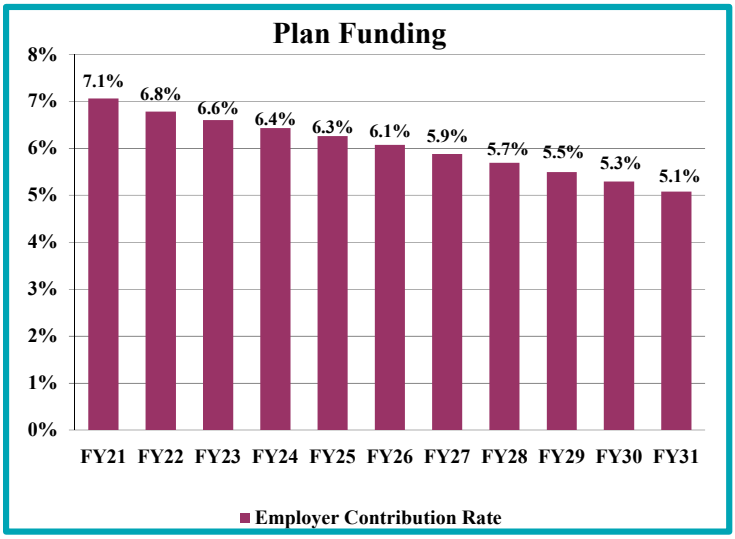
These graphs show the expected progress of the Plan over the next 10 years, assuming the Plan's assets earn 7.0% on a *market value* basis and assuming all other assumptions are exactly met, including that the actuarially determined contribution (ADC) amounts are made in full. The chart entitled "Plan Funding" shows a gradual decline in the projected employer ADC rates from the 6.78% rate in FY 2022, determined by the current valuation, to 6.17% at the end of this 10-year period, absent further gains and losses.

The "Assets and Liabilities" graph shows the projected funded ratios for the Plan over the 10-year projection period. The Plan's funded status is projected to improve from 96% to 100% at the end of the 10-year projection period, assuming all assumptions are exactly met.



SECTION I – BOARD SUMMARY

Projections with Asset Returns of 8.0%

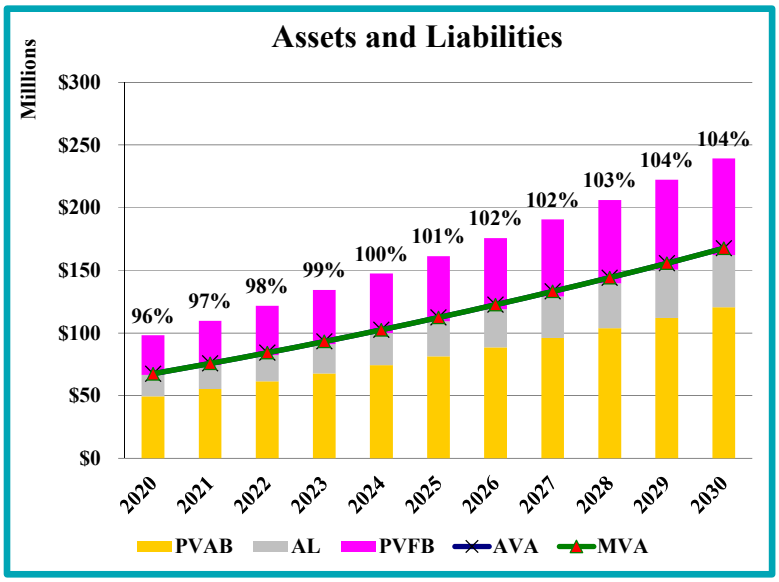


The Plan's investment earnings will affect the future funding status of the Plan. The two graphs on this page show what the next 10 years are expected to look like if the Plan's investment performance is 8.0% each year, 1.0% higher than the valuation investment rate of return assumption.

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

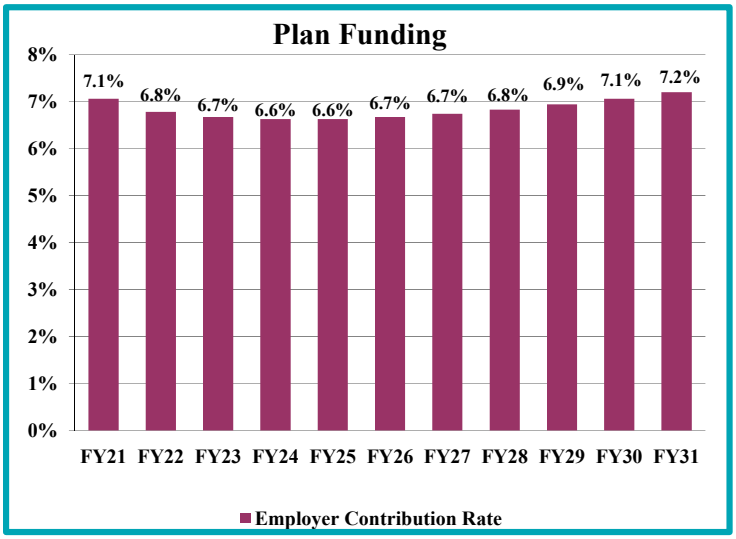
The "Plan Funding" graph shows that under this scenario, the employer ADC rate would decrease more rapidly than in the baseline case. The rate declines to 5.08% of payroll at the end of the 10-year projection period.

The "Assets and Liabilities" graph shows that under this scenario, the Plan would reach a 104% funded ratio by 2030, an improvement over the baseline scenario's ultimate level of 100%.



SECTION I – BOARD SUMMARY

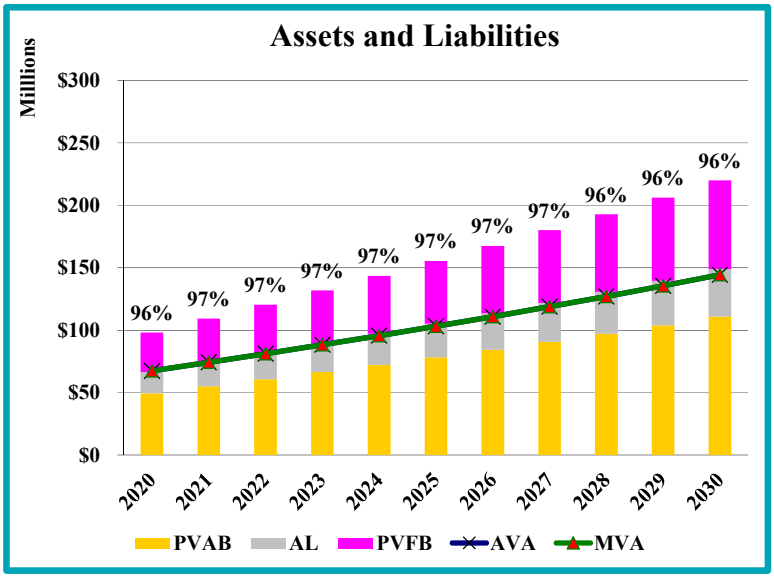
Projections with Asset Returns of 6.0%



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

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

Under this scenario, the employer ADC rate increases to approximately 7.20% of payroll by the end of the 10-year projection period, significantly greater than the 6.17% ultimate rate in the baseline projection. Additionally, the funded ratio is projected to be lower in this scenario, stabilized at 96% at the end of the 10-year projection period, compared to the 100% 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	878	956	8.88%
Disabled Members	5	5	0.00%
Retirees and Beneficiaries	140	155	10.71%
Terminated Vested Members	65	81	24.62%
Terminated Non-Vested Members	28	39	39.29%
Total Member Counts	**1,116**	**1,236**	**10.75%**
Covered Payroll of Active Members*	$ 46,214,900	$ 51,271,500	10.94%
Annual Benefit Payments for Retirees, Disabled Members, and Beneficiaries	$ 1,539,300	$ 1,671,100	8.56%
Assets and Liabilities			
Actuarial Liability (AL)	$ 62,793,600	$ 69,417,000	10.55%
Actuarial Value of Assets (AVA)	59,016,400	66,508,100	12.69%
Unfunded AL (UAL)	$ 3,777,200	$ 2,908,900	(22.99)%
Funded Ratio on AVA Basis (AVA/AL)	94.0%	95.8%	
Funded Ratio on MVA Basis (MVA/AL)	93.2%	97.2%	
Present Value of Accrued Benefits (PVAB)	$ 45,813,100	$ 51,662,300	12.77%
Market Value of Assets (MVA)	58,536,200	67,470,200	15.26%
Unfunded PVAB	$ (12,723,100)	$ (15,807,900)	(24.25)%
Accrued Benefit Funded Ratio (MVA/PVAB)	127.8%	130.6%	
Employer Contribution Rate	**Fiscal Year 2021**	**Fiscal Year 2022**	
Entry Age Normal Cost	5.74%	5.77%	
UAL Amortization Payment	1.02%	0.71%	
Administrative Expense	0.30%	0.30%	
Actuarially Determined Contribution (ADC)	7.06%	6.78%	

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

SECTION II – RISK DISCLOSURE

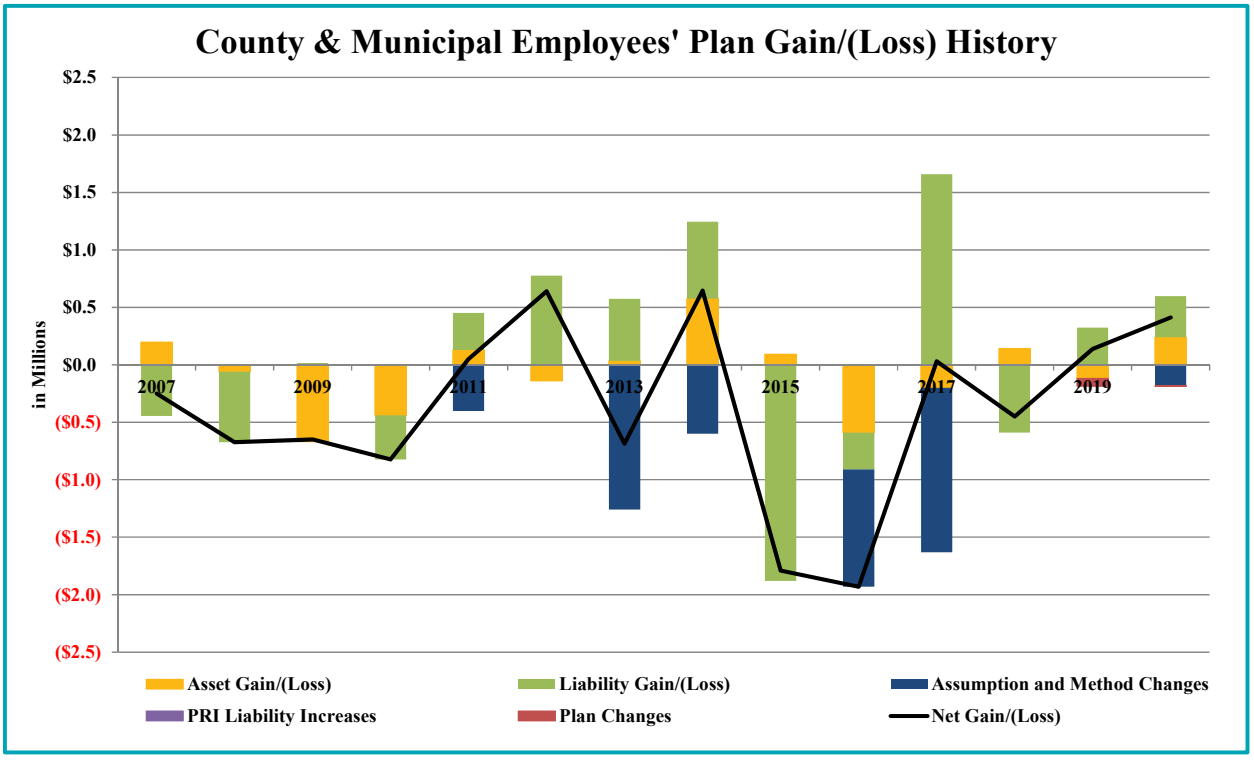
Introduction

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 DISCLOSURE

This shows that the liability gain/(loss) has been the most significant risk for the Plan for any given year over this period in regards to the actual liability measurements deviating from the expected. After that, the next two most significant causes are the asset gain/(loss) and the assumption and method changes. Additionally, this graph shows that over the whole period shown the liability gain/(loss) values have largely offset each other. Over the whole period, assumption changes have 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.

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 the 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.

SECTION II – RISK DISCLOSURE

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. Causes of these changes include capital market changes 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 changes. 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. The remaining changes to assumptions have had relatively insignificant impacts.

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.

SECTION II – RISK DISCLOSURE

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.

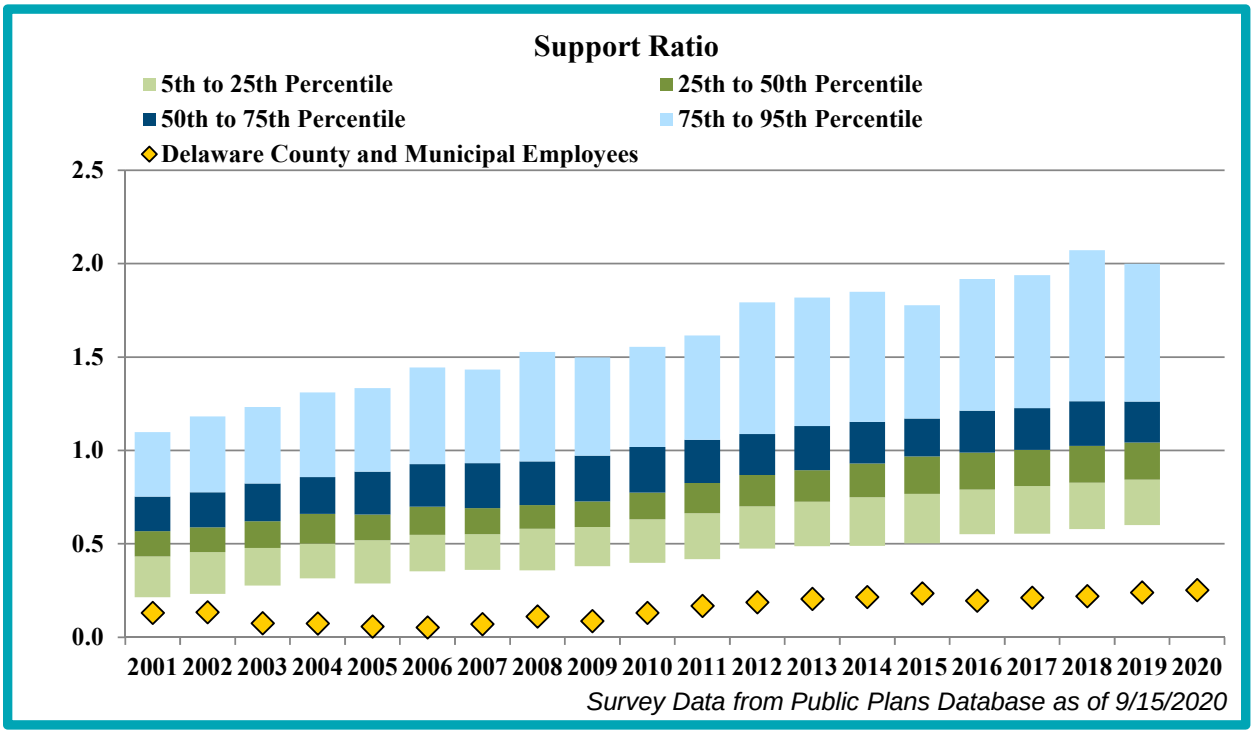
Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic the larger the plan is compared to the contribution or revenue base that supports it, the more sensitive the plan will be to risk. There are extensive measures available to assess plan maturity. For this plan, we 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 measure of the Plan's maturity is the support ratio, which is the ratio of the number of inactive members (those receiving benefits currently or entitled to a deferred benefit) to the number of active members. 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. The Delaware County & Municipal Employees' Pension Plan is represented by the gold diamonds. 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 DISCLOSURE



This graph shows the support ratio has generally increased over time. This graph shows that Delaware County & Municipal Employees' support ratio is lower than a typical plan, indicating that the Plan is less mature based on this metric. As of the most recent dates for which the full database is available, the Delaware County & Municipal Employees' support ratio remains well 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 understanding 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

SECTION II – RISK DISCLOSURE

related to this are anticipated to be investment risk, mortality and other demographic risk, and assumption change risk.

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.

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		**$ 58,536,200**
Additions		
Member Contributions	$ 1,285,000	
Employer Contributions	3,572,100	
Investment Returns	5,917,700	
Total Additions	**$ 10,774,800**	
Deductions		
Benefit Payments	$ 1,733,100	
Administrative Expenses	107,700	
Total Deductions	**$ 1,840,800**	
Market Value of Assets – June 30, 2020		**$ 67,470,200**

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	$ 59,016,400
2.	Amount in (1) with interest to June 30, 2020 at 7.0% per year	63,147,500
3.	Employer and member contributions for FY 2020	4,857,100
4.	Interest on contributions assuming payments made uniformly throughout the year to June 30, 2020 at 7.0% per year	167,100
5.	Disbursements from Trust except investment expenses, July 1, 2019 through June 30, 2020	1,840,800
6.	Interest on disbursements to June 30, 2020 at 7.0% per year	63,300
7.	Expected Actuarial Value of Assets at June 30, 2020 = (2) + (3) + (4) – (5) – (6)	$ 66,267,600
8.	Actual Market Value of Assets at June 30, 2020	$ 67,470,200
9.	Excess of (8) over (7)	$ 1,202,600
10.	Actuarial Value of Assets at June 30, 2020 = (7) + 20% of (9)	$ 66,508,100

SECTION III – ASSETS

Investment Performance

The market value of assets (MVA) returned 9.9% during 2020, which is more than the prior year's assumed 7.0% investment rate of return. The actuarial value of assets (AVA) returned 7.4% over this same year, reflecting the asset smoothing methodology being utilized by the Plan for the measurement of the actuarial value of assets. Since a maximum of 20% of the gain or loss from the performance of the Plan is typically recognized in a given year under the adopted asset smoothing method, in periods of very good performance, the AVA can lag significantly behind the MVA, and in a period of negative returns, the AVA does not decline as rapidly as the MVA.

Projection of Cash Flows

Table III-3
Cash Flow Projections

Year Beginning July 1,	Expected Benefit Payments	Expected Contributions*
2020	$ 2,217,000	$ 5,026,000
2021	2,456,000	5,004,000
2022	2,702,000	5,129,000
2023	3,071,000	5,257,000
2024	3,413,000	5,389,000
2025	3,793,000	5,523,000
2026	4,214,000	5,661,000
2027	4,606,000	5,803,000
2028	4,992,000	5,948,000
2029	5,365,000	6,097,000

* Expected contributions include participating employer contributions and member contributions. For illustration purposes, we have assumed the employer contribution rate will remain level from FYE 2022 at 6.78% 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, 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 or salary increases. These liabilities are also required for some accounting purposes of some plans (Topic No. 960) and are sometimes used as part of assessing whether a plan can meet its current benefit commitments. Note that the development of this amount also assumes that all actuarial assumptions are met, including the assets returning 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	$ 74,490,000	$ 82,343,100
Retiree, Beneficiary, Disabled, and Terminated Members Benefits	18,201,900	20,159,500
Present Value of Benefits (PVB)	**$ 92,691,900**	**$ 102,502,600**
Market Value of Assets (MVA)	$ 58,536,200	$ 67,470,200
Future Member Contributions	9,993,200	11,039,900
Future Employer Contributions	24,162,500	23,992,500
Total Resources	**$ 92,691,900**	**$ 102,502,600**
Actuarial Liability		
Present Value of Benefits (PVB)	$ 92,691,900	$ 102,502,600
Present Value of Future Employer Normal Costs (PVFNC)	19,905,100	22,045,700
Present Value of Future Member Contributions (PVFEEC)	9,993,200	11,039,900
Actuarial Liability (AL=PVB–PVFNC–PVFEEC)	**$ 62,793,600**	**$ 69,417,000**
Actuarial Value of Assets (AVA)	59,016,400	66,508,100
Net (Surplus)/Unfunded AL (AL – AVA)	**$ 3,777,200**	**$ 2,908,900**
Present Value of Accrued Benefits		
Present Value of Benefits (PVB)	$ 92,691,900	$ 102,502,600
Present Value of Future Benefit Accruals (PVFBA)	46,878,800	50,840,300
Present Value of Accrued Benefits (PVAB=PVB–PVFBA)	**$ 45,813,100**	**$ 51,662,300**
Market Value of Assets (MVA)	$ 58,536,200	$ 67,470,200
Net (Surplus)/Unfunded PVAB (PVAB – MVA)	**$ (12,723,100)**	**$ (15,807,900)**

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 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 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.

Table IV-2
Liability Changes

	Present Value of Benefits	Actuarial Liability	Present Value of Accrued Benefits
Liabilities June 30, 2019	$ 92,691,900	$ 62,793,600	$ 45,813,100
Liabilities June 30, 2020	102,502,600	69,417,000	51,662,300
Liability Increase/(Decrease)	9,810,700	6,623,400	5,849,200
Change Due to:			
Benefit Changes	4,100	4,100	4,100
Assumption Changes	228,500	181,700	918,700
Actuarial (Gain)/Loss	NC *	(357,700)	NC *
Benefits Accumulated and Other (Gain)/Loss	9,578,100	6,795,300	4,926,400

* 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, Disabled, and Terminated Members	$ 18,201,900	$ 20,159,500
	Active Members	44,591,700	49,257,500
	Total Actuarial Liability (AL)	**$ 62,793,600**	**$ 69,417,000**
2.	Actuarial Value of Assets (AVA)	$ 59,016,400	$ 66,508,100
3.	Unfunded Actuarial Liability (UAL) [AL – AVA]	$ 3,777,200	$ 2,908,900
4.	Unpaid UAL from Participating Municipalities	$ 0	$ 0
5.	**Net Base for 10-Year UAL Amortization (3-4)**	**$ 3,777,200**	**$ 2,908,900**

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 expected future salary. Then, this individual total normal cost rate is reduced by the member's contribution rate to produce the employer normal cost rate for each member. The employer normal cost rate, times payroll for each active member, equals the employer normal cost. The sum of the employer normal cost amounts for all active members is then divided by the covered payroll for all active members to produce the employer normal cost contribution rate.

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

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

The current assumed administrative expense rate is 0.30% 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 employer contribution rates for the Plan based on this funding valuation and the one immediately prior.

Table V-1
Employer Contribution Rate

Valuation Date	**June 30, 2019**	**June 30, 2020**
FY Contribution Rate Payable	**FY 2021**	**FY 2022**
Employer Entry Age Normal Cost Rate	5.74%	5.77%
UAL Amortization Payment Rate	1.02%	0.71%
Administrative Expense Rate	0.30%	0.30%
Actuarially Determined Contributions	7.06%	6.78%

SECTION V – CONTRIBUTIONS

Table V-2 below provides additional detail about the development of the actuarially determined contribution rate for participating employers as well as the expected dollar amounts these rates will result in for FY 2022.

Table V-2
Expected FY 2022
Employer Contributions

	In Dollars	As % of Payroll
1. Present Value of Projected Benefits Attributable to:		
a. Total Normal Cost	$ 4,363,200	8.51%
b. Expected Member Contributions	1,404,800	2.74%
c. Employer-Paid Normal Cost (a) – (b)	$ 2,958,400	5.77%
2. Amortization of Unfunded Liability	362,300	0.71%
3. Allowance for Administrative Expense	153,800	0.30%
4. Total Employer Actuarially Determined Contributions (1) + (2) + (3)	$ 3,474,500	6.78%

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.

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 payroll for future hires to pay for the benefits that have already been accrued by the current population. This valuation does not contain the additional disclosures required by GASB Statement No. 68 for the plan sponsor's CAFR.

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	$ 16,042,500	$ 17,381,700
b. Former Vested Members	2,159,400	2,777,800
c. Active Members	27,611,200	31,502,800
2. Total PVAB [1(a) + 1(b) + 1(c)]	$ 45,813,100	$ 51,662,300
3. Market Value of Assets (MVA)	58,536,200	67,470,200
4. Unfunded PVAB [2 – 3]	$ (12,723,100)	$ (15,807,900)
5. Ratio of MVA to PVAB [3 / 2]	127.8%	130.6%
Reconciliation of PVAB		
Actuarial PVAB at June 30, 2019		$ 45,813,100
Increase/(Decrease) During Years Attributable to:		
Passage of Time		3,147,300
Benefits Paid – FY 2020		(1,733,100)
Benefit Changes		64,100
Assumption Changes		918,700
Benefits Accrued, Other Gains/Losses		3,452,200
Net Increase/(Decrease)		5,849,200
PVAB at June 30, 2020		$ 51,662,300

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-2
GASB No. 67 Disclosures

	June 30, 2020	Estimated June 30, 2021
Total Pension Liability (TPL)		
Service cost	**$ 3,919,000**	**$ 4,362,000**
Interest	4,610,000	5,088,000
Changes in benefit terms	4,000	0
Differences between expected and actual experience	(324,000)	(358,000)
Changes in assumptions	0	182,000
Benefit payments, including refunds of member contributions	(1,733,000)	(2,217,000)
Net change in TPL	**$ 6,476,000**	**$ 7,057,000**
TPL - beginning	**$ 63,117,000**	**$ 69,593,000**
TPL - ending (a)	**$ 69,593,000**	**$ 76,650,000**
Fiduciary Net Position (FNP)		
Contributions - Employer	$ 3,572,000	$ 3,620,000
Contributions - Non-employer	0	0
Contributions - Member	1,285,000	1,406,000
Net investment income	5,918,000	4,814,000
Benefit payments, including refunds of member contributions	(1,733,000)	(2,217,000)
Administrative expenses	(108,000)	(154,000)
Net change in Plan FNP	**$ 8,934,000**	**$ 7,469,000**
FNP - beginning	**$ 58,536,000**	**$ 67,470,000**
FNP - ending (b)	**$ 67,470,000**	**$ 74,939,000**
Net Pension Liability/(Asset) - ending [(a)-(b)]	**$ 2,123,000**	**$ 1,711,000**

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

SECTION VI – ACCOUNTING STATEMENT INFORMATION

Table VI-3
Note to Required Supplementary Information

The June 30, 2019 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 assumptions:	
Investment rate of return*	7.0%
Projected salary increases*	2.5% plus merit component based on service
Cost-of-living adjustments	ad hoc
* Includes inflation at	2.50%

The actuarially determined contribution for fiscal year 2022 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
Amortization method:	Percentage of pay – open Pay increases at 2.5% per year
Amortization period:	10 years
Asset valuation method:	Smoothed market, 20% annual market weight
Actuarial assumptions:	
Investment rate of return*	7.0%
Projected salary increases*	2.5% plus merit component based on service
Cost-of-living adjustments	ad hoc
* Includes inflation at	2.50%

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

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

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

Type of Activity	*Gain (or Loss) for Year Ending June 30, (expressed in thousands)* 2015	2016	2017	2018	2019	2020
Investment Income on Actuarial Assets	$ 91	$ (592)	$ (203)	$ 138	$ (120)	$ 241
Combined Liability Experience	(1,881)	(324)	1,664	(594)	324	358
(Loss)/Gain during Year from Financial Experience	$ (1,790)	$ (916)	$ 1,461	$ (456)	$ 204	$ 599
Non-Recurring Items	0	(1,018)	(1,437)	0	(67)	(186)
Composite Gain (or Loss) during Year	$ (1,790)	$ (1,934)	$ 24	$ (456)	$ 137	$ 413

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	$ 9,049	$ 17,382	$ 42,986	$ 66,508	100%	100%	93%
2019	7,764	16,043	38,987	59,016	100	100	90
2018	7,057	13,729	36,077	52,571	100	100	88
2017	6,159	12,399	32,131	46,687	100	100	88
2016	5,749	9,241	30,821	41,660	100	100	87
2015	5,047	6,913	27,804	37,477	100	100	92

APPENDIX A – MEMBERSHIP INFORMATION

Delaware County & Municipal Employees' Pension Plan
Data Reconciliation

	A	P-TDV	P-SUPP	P-RET	P-DIS	P-SR	P-SURV	Total
1. June 30, 2019 valuation	**878**	**51**	**14**	**121**	**5**	**0**	**19**	**1,088**
2. Additions								
(a) New entrants	186	7		1				194
(b) New Beneficiary/QDRO							2	2
(c) Total	186	7		1			2	196
3. Reductions								
(a) Terminated - not vested	(80)							(80)
(b) Paid Out/Expired/Death		(3)		(4)				(7)
(c) Total	(80)	(3)		(4)				(87)
4. Changes in status								
(a) P-TDV	(18)	20	(2)					
(b) P-SUPP								
(c) Returned to work	3	(3)						
(d) P-RET	(13)	(3)		16				
(e) PRET25								
(f) P-DIS								
(g) P-LTD								
(h) P-SURV								
(i) PSUR25								
(j) P-SR								
(k) Data corrections								
(l) Total	(28)	14	(2)	16				
5. June 30, 2020 valuation	**956**	**69**	**12**	**134**	**5**	**0**	**21**	**1,197**

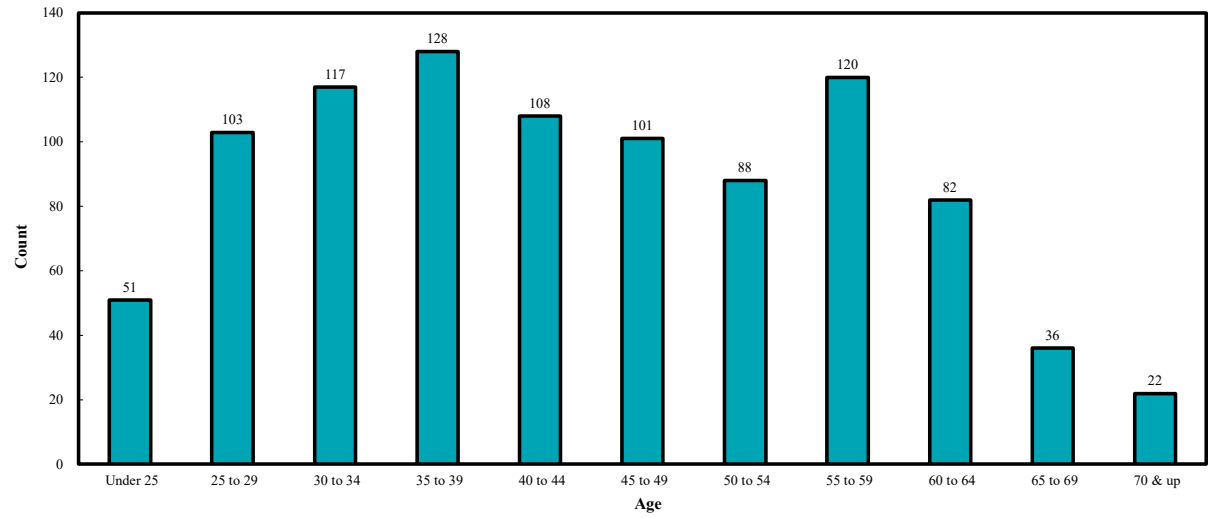
A=Active, P-TDV=Terminated Deferred Vested, P-SUPP=Terminated Deferred Vested, P-RET=Retired, PRET25=Retired, P-DIS=Disabled, P-LTD=Long-Term Disabled, P-SURV=Surviving Beneficiary, PSUR25=Surviving Beneficiary, P-SR=Disabled

APPENDIX A – MEMBERSHIP INFORMATION

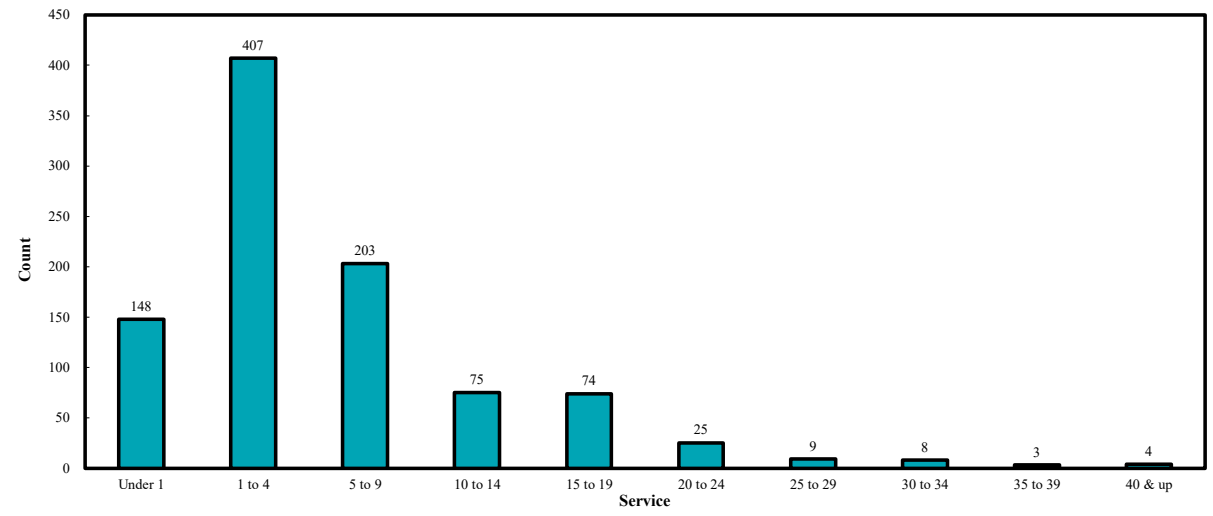
Delaware County and Municipal Pension Plan Distribution of Active Members by Age and Service as of June 30, 2020											
Counts By Age/Service											
	Service										
Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	**Total**
Under 25	21	30	0	0	0	0	0	0	0	0	51
25 to 29	33	60	10	0	0	0	0	0	0	0	103
30 to 34	21	59	30	6	1	0	0	0	0	0	117
35 to 39	19	58	34	11	6	0	0	0	0	0	128
40 to 44	8	49	25	13	10	3	0	0	0	0	108
45 to 49	7	37	25	10	16	4	2	0	0	0	101
50 to 54	9	31	12	14	12	7	1	2	0	0	88
55 to 59	17	41	32	7	10	7	2	1	3	0	120
60 to 64	5	26	22	8	11	2	3	3	0	2	82
65 to 69	3	13	8	2	7	1	0	2	0	0	36
70 & up	5	3	5	4	1	1	1	0	0	2	22
Total	148	407	203	75	74	25	9	8	3	4	956

APPENDIX A – MEMBERSHIP INFORMATION

Delaware County and Municipal Pension Plan Distribution of Active Members by Age as of June 30, 2020



Delaware County and Municipal Pension Plan Distribution of Active Members by Service as of June 30, 2020

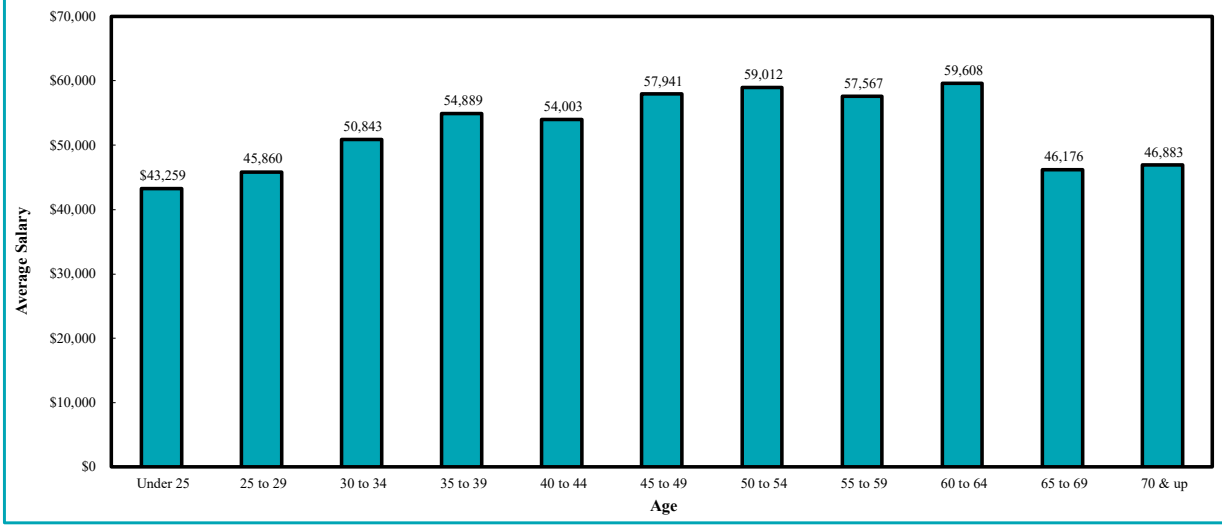


APPENDIX A – MEMBERSHIP INFORMATION

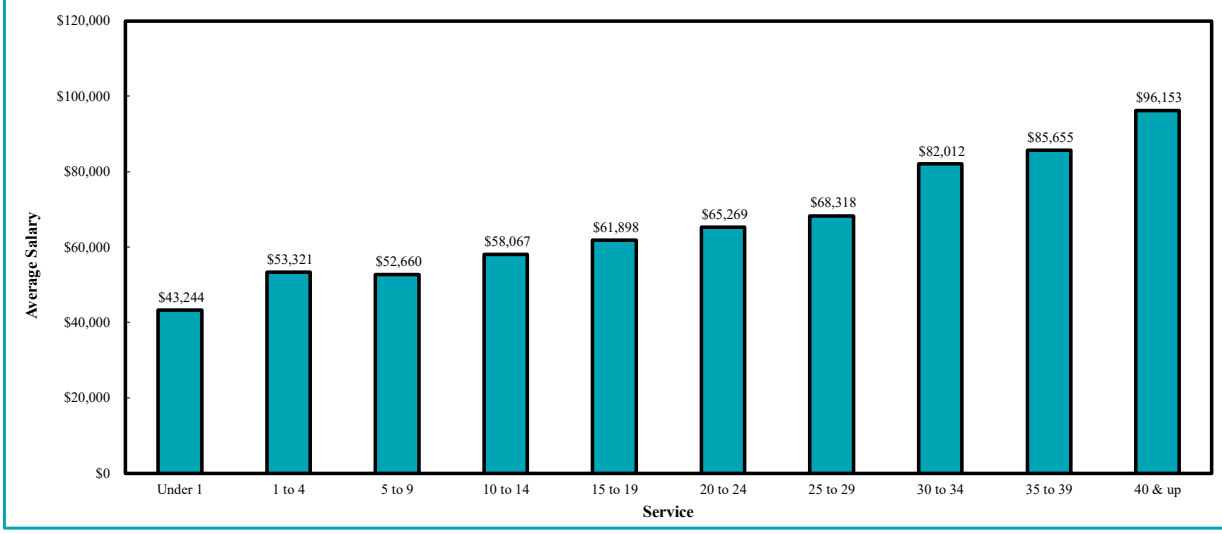
Delaware County and Municipal Pension Plan Salary Distribution of Active Members by Age and Service as of June 30, 2020											
Average Salary by Age/Service											
	Service										
Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	**Total**
Under 25	$ 44,213	$ 42,591	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 43,259
25 to 29	45,086	46,816	42,681	0	0	0	0	0	0	0	45,860
30 to 34	41,473	54,600	49,701	54,468	38,490	0	0	0	0	0	50,843
35 to 39	46,418	52,954	59,555	59,631	65,285	0	0	0	0	0	54,889
40 to 44	40,842	51,332	57,624	57,731	63,600	54,407	0	0	0	0	54,003
45 to 49	43,907	57,463	53,617	51,038	66,171	95,930	62,648	0	0	0	57,941
50 to 54	51,076	56,648	54,321	59,801	67,105	56,419	89,656	99,204	0	0	59,012
55 to 59	38,723	58,200	53,671	72,179	66,861	63,920	74,284	119,263	85,655	0	57,567
60 to 64	43,540	64,731	53,137	55,850	59,490	69,127	61,905	74,117	0	85,329	59,608
65 to 69	31,771	54,034	34,862	64,263	42,055	46,690	0	58,035	0	0	46,176
70 & up	33,156	51,010	29,814	48,403	32,875	57,473	65,630	0	0	106,977	46,883
Total	$ 43,244	$ 53,321	$ 52,660	$ 58,067	$ 61,898	$ 65,269	$ 68,318	$ 82,012	$ 85,655	$ 96,153	$ 53,631

APPENDIX A – MEMBERSHIP INFORMATION

Delaware County and Municipal Pension Plan Salary Distribution of Active Members by Age as of June 30, 2020



Delaware County and Municipal Pension Plan Salary Distribution of Active Members by Service as of June 30, 2020



APPENDIX A – MEMBERSHIP INFORMATION

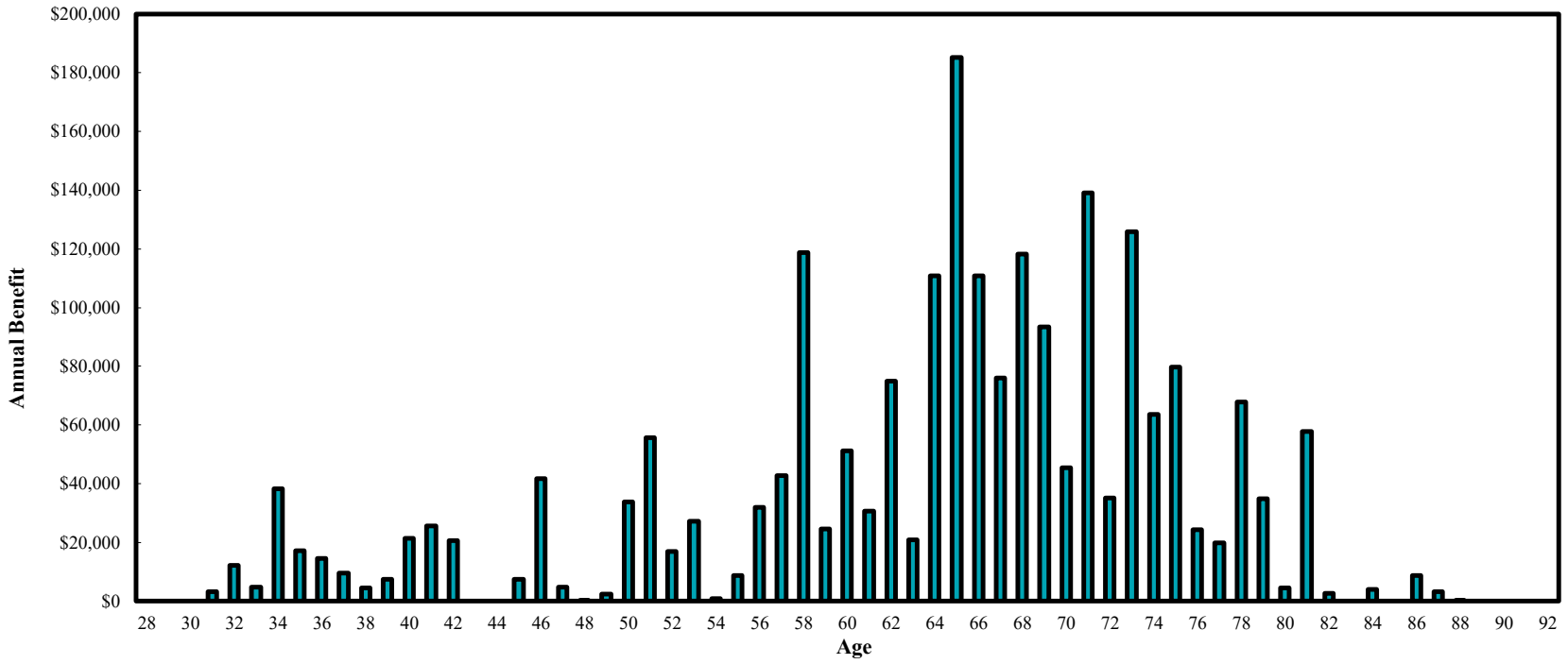
Delaware County and Municipal Pension Plan Annual Benefit Distribution of Retired Members, Survivors, Disabled, and Vested Members as of June 30, 2020

Age	Count	Annual Benefit	Age	Count	Annual Benefit
<25	0	$0	73	11	$125,751
25	0	$0	74	6	$63,700
26	0	$0	75	6	$79,680
27	0	$0	76	3	$24,301
28	0	$0	77	3	$19,806
29	0	$0	78	6	$67,955
30	0	$0	79	6	$34,938
31	1	$3,304	80	1	$4,468
32	2	$12,177	81	7	$57,852
33	1	$4,792	82	1	$2,692
34	5	$38,207	83	0	$0
35	3	$17,141	84	1	$3,899
36	3	$14,532	85	0	$0
37	2	$9,540	86	1	$8,858
38	1	$4,504	87	1	$3,347
39	2	$7,486	88	1	$310
40	4	$21,473	89	0	$0
41	3	$25,688	90	0	$0
42	4	$20,623	91	0	$0
43	0	$0	92	0	$0
44	0	$0	93	1	$436
45	1	$7,435	94	0	$0
46	3	$41,619	95	0	$0
47	1	$4,927	96	0	$0
48	1	$460	97	0	$0
49	1	$2,520	98	0	$0
50	5	$33,796	99	0	$0
51	5	$55,626	100	0	$0
52	4	$16,921	101	0	$0
53	3	$27,161	102	0	$0
54	1	$936	103	0	$0
55	1	$8,689	104	0	$0
56	4	$31,991	105	0	$0
57	5	$42,852	106	0	$0
58	7	$118,667	107	0	$0
59	3	$24,631	108	0	$0
60	5	$51,134	109	0	$0
61	7	$30,686	110	0	$0
62	5	$75,003	111	0	$0
63	6	$21,017	112	0	$0
64	11	$110,904	113	0	$0
65	14	$185,185	114	0	$0
66	13	$110,829	115	0	$0
67	6	$75,919	116	0	$0
68	12	$118,323	117	0	$0
69	10	$93,412	118	0	$0
70	6	$45,416	119	0	$0
71	11	$139,070	120	0	$0
72	4	$35,013			
			Totals	241	$2,187,601

For vested members, amounts shown are those payable once the participant reaches retirement eligibility.

APPENDIX A – MEMBERSHIP INFORMATION

Delaware County and Municipal Pension Plan Annual Benefit Distribution of Retired Members, Survivors, Disabled, and Vested Members as of June 30, 2020



For vested members, amounts shown are those payable once the participant reaches retirement eligibility.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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

1. Demographic Assumptions

a. Rates of Mortality

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

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

(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 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):

(2020 Values Shown)		
Age	Male	Female
25	89	27
30	86	34
35	101	47
40	121	65
45	188	102
50	231	133
55	266	168
60	303	200
65	362	243
70	469	330
75	642	484
80	915	730
85	1,364	1,107
90	2,116	1,658
95	2,999	2,437
100	3,953	3,429

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.

b. Sample Rates of Active Disability

Rates of Active Disability	
Age	Current
20	0.0522%
25	0.0522
30	0.1831
35	0.2694
40	0.3821
45	0.4653
50	0.6214
55	0.9522
60	1.565

No disability assumed once member reaches normal or early retirement eligibility or age 65.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

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

Rates of Termination*	
Service	Rates
0	21.00%
1	20.00
2	18.00
3	14.00
4	12.00
5	10.00
6	8.00
7	6.00
8	4.00
9 – 14	2.00
15	1.75
16	1.50
17	1.25
18	1.00
19	0.75
20	0.50
21	0.25
22+	0.00

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

d. Rates of Retirement

Retirement Rates*	
Age	Rate
<45	0.00%
45 – 59	10.00
60	30.00
61 – 64	15.00
65	20.00
66 – 74	15.00
75+	100.00

* Rates only applicable if member meets eligibility.

APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

e. Salary Increase Rates

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

Service	Increase
0	10.00%
1	8.00
2	6.00
3	5.00
4	4.75
5	4.50
6	4.25
7	4.00
8	3.75
9	3.50
10+	3.00

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%

3. Technical and Miscellaneous Assumptions

a. Decrement timing: Middle of year
b. Terminated vested death: All terminated vested members are assumed to be married

4. Disclosures regarding Models Used

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

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 rate is determined as a level percent of pay for each active member. The normal cost rate times payroll equals the normal cost for each active member. The normal cost plus member contributions will pay for projected benefits at retirement for each active plan participant.

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

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

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

2. Actuarial Value of Assets

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

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 or regular part-time employees and elected or appointed officials of a county or municipality including state governmental subdivisions.

2. Member Contributions

3% of compensation that exceeds $6,000 per annum

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

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

3. Credited Service

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

4. Final Average Compensation

Final Average Compensation is the average over the highest 60 consecutive months (or shorter period of total service).

5. Normal Retirement

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

Benefit: 1 2/3% of final average compensation for each year of credited service

6. Early Retirement

Eligibility: Age 55 with 15 years of credited service

Benefit: Normal retirement benefit reduced by 0.4% for each month the member is under age 60 at the time of retirement

APPENDIX C – SUMMARY OF PLAN PROVISIONS

7. Disability Benefit

Eligibility: Five years of credited service

Benefit: Normal retirement benefit

8. Survivor's Benefit

Eligibility: Death while active with five years of credited service

Benefit: For eligible survivors of employees who die in active service: 50% of the normal retirement benefit the employee would have been eligible to receive at age 62

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

9. Vesting

Eligibility: Five years of credited service

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

10. Withdrawal of Employee Contributions

Eligibility: Terminated service

Benefit: Accumulated employee contributions with interest

11. Form of Payment

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

APPENDIX C – SUMMARY OF PLAN PROVISIONS

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

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

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

12. Cost-of-Living Adjustment

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

13. Changes Since Last Valuation

None