

**Via Electronic Mail**

January 20, 2022

Ms. Joanna M. Adams  
 Pension Administrator  
 Delaware Public Employees' Retirement System  
 McArdle Building  
 860 Silver Lake Boulevard, Suite 1  
 Dover, Delaware 19904

**Re: Closed State Police June 30, 2021 Actuarial Valuation**

Dear Joanna:

We have completed our Actuarial Valuation of the 458 members remaining in the Closed State Police Plan as of June 30, 2021. Our results are as follows.

<b>Valuation Results</b>	
Actuarial Liability (AL)	\$ 249,152,600
Actuarial Value of Assets (AVA, equal to MVA)	<u>4,258,800</u>
AVA Unfunded AL (UAL)	\$ 244,893,800
Funded Ratio on AVA (AVA/AL)	1.7%
Present Value Accumulated Plan Benefits (PVAB)	\$ 249,152,600
MVA	<u>4,258,800</u>
Unfunded PVAB	\$ 244,893,800
Accrued Benefit Funded Ratio (MVA/PVAB)	1.7%

Beginning with the June 30, 2021 valuation, the actuarial value of assets is set equal to the market value of assets.

The Closed State Police Plan is funded on a pay-as-you-go basis. We have calculated an actuarially determined contribution amount for disclosure purposes, using a closed amortization period with 15 years remaining as of the June 30, 2021 valuation date. The amortization uses a level dollar method and a discount rate of 7.0% for a resulting contribution amount of \$26,029,800 (including a margin for expenses) for fiscal year 2022.

**Data and Assumptions**

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.

Ms. Joanna M. Adams

January 20, 2022

Page ii

We found the data to be reasonably consistent and comparable with data used in the prior valuation. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

Appendix A outlines the actuarial assumptions used, and Appendix B provides a summary of the Plan provisions. Appendix C contains a summary of the data, and Appendix D contains risk and accounting disclosure information.

The Actuarial Liability was based on a 7.00% net investment return and mortality tables as outlined in Appendix A for valuation purposes. For GASB 67, the disclosure used 2.21% at the beginning of the current measurement period and 2.16% at the end, based on the Bond Buyer GO 20-Year Municipal Bond Index, an index satisfying the GASB requirement for 20-year, tax-exempt general obligation bonds with an average rating of AA/Aa or higher.

We believe these assumptions reflect our best estimate of anticipated future experience of the Plan. Our results are dependent upon future experience conforming to these assumptions. It is certain that actual experience will not conform exactly to these assumptions. Actual amounts will differ from projected amounts to the extent actual experience differs from expected experience.

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

Sincerely,

Cheiron



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



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

Attachments

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX A – ACTUARIAL ASSUMPTIONS**

**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 Healthy Annuitant Lives at Selected Ages  
(number of deaths per 10,000 members):**

(2021 Values Shown)		
Age	Male	Female
50	30	21
55	45	30
60	69	41
65	99	59
70	153	95
75	259	170
80	467	315
85	859	596
90	1,490	1,111
95	2,322	1,811
100	3,341	2,729

Rates are based on 107% and 100% of the Pub-2010 General Benefits Weighted Healthy Annuitant Mortality Table, respectively, for males and females, using the Pub-2010 General Employee Mortality Table for ages prior to start of the Healthy Annuitant Mortality Table, both projected from the 2010 base rates using the RPEC-2020 model, with an ultimate rate of 0.85% for ages 20-80, grading down to an ultimate rate of 0% for ages 114-120, and convergence to the ultimate rate in the year 2027. The valuation uses a fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX A – ACTUARIAL ASSUMPTIONS**

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

(2021 Values Shown)		
Age	Male	Female
25	36	22
30	53	38
35	72	58
40	89	78
45	112	102
50	161	148
55	220	190
60	279	220
65	330	230
70	390	271
75	503	384
80	719	597
85	1,081	949
90	1,650	1,401
95	2,396	1,968
100	3,341	2,893

Rates are based on 107% and 106% of the Pub-2010 General Benefits Weighted Disabled Annuitant Mortality Table, respectively, for males and females, projected from the 2010 base rates using the RPEC-2020 model, with an ultimate rate of 0.85% for ages 20-80, grading down to an ultimate rate of 0% for ages 114-120, and convergence to the ultimate rate in the year 2027. The valuation uses a fully generational projection of mortality improvements. Sample rates shown are those projected through the valuation date.

**2. Economic Assumptions**

- a. Investment Rate of Return for valuation purposes: 7.00%
- b. Discount Rate as of June 30, 2020 for GASB No. 67: 2.21%
- c. Discount Rate as of June 30, 2021 for GASB No. 67: 2.16%
- d. Annual Assumed Cost-of-Living Increase Rate for Retirees: 2.50%
- e. Administrative Expenses Assumption: Assumed equal to prior year's actual value

**3. Rationale for Assumptions**

The assumptions were adopted by the Board of Trustees upon the recommendation of the actuary, based on an experience study review performed in 2021 and covering the period July 1, 2015 to June 30, 2020. 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.

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX A – ACTUARIAL ASSUMPTIONS**

**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.

**5. Changes Since Last Valuation and Rationale for Changes**

The discount rates for GASB purposes were updated to reflect the current Bond Buyer GO 20-Year Municipal Bond Index.

The following assumption was changed to better reflect the experience observed during the experience study covering the period July 1, 2015 through June 30, 2020. The Board of Trustees adopted the experience study at the September 24, 2021 meeting.

- Healthy Inactive Mortality and Disabled Mortality

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX A – ACTUARIAL ASSUMPTIONS**

**B. Actuarial Methods**

**1. Funding Method**

This plan is funded on a pay-as-you-go basis, with contributions added to the Trust annually, approximately equal to the amount of benefits being paid out that year.

**2. Actuarial Value of Assets**

The actuarial value of assets is set equal to the market value of assets as of the valuation date.

**3. Changes Since Last Valuation**

None

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX B – SUMMARY OF PLAN PROVISIONS**

**1. Membership**

The Plan covers all State police officers in employment after June 11, 1970 and appointed before July 1, 1980.

**2. Benefit Amounts**

As the Plan has no remaining actives, benefit amounts are paid as have been determined under the Plan's provisions through the end of the month in which the last of the member and eligible survivors (if any) dies.

**3. Form of Payment**

For members receiving a service pension or service-related disability pension, eligible survivors receive 75% of the member's pension at time of death. For members receiving a non-service related disability pension, eligible survivors receive 50% of the member's pension at time of death.

**4. Cost-of-Living Adjustment**

A cost-of-living adjustment is made annually.

**5. Burial Benefit**

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

**6. Changes Since Last Valuation**

None

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX C – DATA SUMMARY**

<b>Data Summary</b>			
	<b>Count</b>	<b>Average Age</b>	<b>Average Monthly Benefit</b>
Healthy Retirees	275	75	\$ 4,490.98
Disabled Retirees	55	74	\$ 4,645.03
Beneficiaries	128	79	\$ 3,079.55

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX D – RISK AND ACCOUNTING DISCLOSURE INFORMATION**

**Risk Disclosure**

The Plan’s actuarial valuation results are dependent upon assumptions about future economic and demographic experience. Based on the 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**

Given that this is a closed plan with no actives, the historical experience of this plan is of limited applicability, but the three most significant sources of deviations of actual results from expected for this plan in recent years have been assumption and method changes, investment gain/(loss), and liability gain/(loss). For historical information, we refer you to the accounting disclosures which follow.

**Risk Identification**

Considering the specific characteristics of the Plan, the assumptions and methods used in the actuarial valuations for the Plan, and the frozen nature of this plan, 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.

*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. However, given the very low level of assets for this plan relative to liabilities, this risk is negligible.

*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

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX D – RISK AND ACCOUNTING DISCLOSURE INFORMATION**

periodically reduced through the Plan’s regular actuarial experience process. As this plan is now frozen, the only source of demographic risk is longevity experience.

*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, a reduction in the assumed rate of return would result in a higher measurement of the Plan’s liability.

**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 measurable 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 principal 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.

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX D – RISK AND ACCOUNTING DISCLOSURE INFORMATION**

**Accounting Statement Information**

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.

This letter contains information reported in the June 30, 2021 Annual Comprehensive Financial Report (ACFR) of Delaware PERS under GASB Statement No. 67. Disclosures are based on the use of updated procedures to roll forward the 2020 funding valuation results. The calculation of Net Pension Liability in the GASB No. 67 Disclosures table on the following page shows the amounts to be disclosed for FY 2021 based on the liabilities of the roll forward of the 2020 funding valuation.

The remaining tables in this section are exhibits to be used for the System’s ACFR. These tables include the Note to Required Supplementary Information, the Analysis of Financial Experience, which is a history of gains and losses in accrued liability, and 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 ACFR.

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX D – RISK AND ACCOUNTING DISCLOSURE INFORMATION**

<b>GASB No. 67 Disclosures</b>	
	<b>June 30, 2021</b>
<b><u>Total Pension Liability (TPL)</u></b>	
Service cost	\$ 0
Interest	8,646,000
Changes in benefit terms	0
Differences between expected and actual experience	97,000
Changes in assumptions	8,125,000
Benefit payments, including refunds of member contributions	(22,652,000)
<b>Net change in TPL</b>	<b>\$ (5,784,000)</b>
<b>TPL - beginning</b>	<b>\$ 402,389,000</b>
<b>TPL - ending (a)</b>	<b>\$ 396,605,000</b>
<b><u>Fiduciary Net Position (FNP)</u></b>	
Contributions - State	\$ 23,175,000
Contributions - Non-employer	0
Contributions - Member	0
Net investment income	3,238,000
Benefit payments, including refunds of member contributions	(22,652,000)
Administrative expenses	(36,000)
<b>Net change in FNP</b>	<b>\$ 3,725,000</b>
<b>FNP - beginning</b>	<b>\$ 534,000</b>
<b>FNP - ending (b)</b>	<b>\$ 4,259,000</b>
<b>Net Pension Liability/(Asset) - ending [(a)-(b)]</b>	<b>\$ 392,346,000</b>

We do not include an estimate of the FY 2022 disclosure because the year end discount rate cannot be known at this time.

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX D – RISK AND ACCOUNTING DISCLOSURE INFORMATION**

**Note to Required Supplementary Information**

The June 30, 2021 total pension liability presented in GASB No. 67 Disclosures was determined as part of the measurement at the date indicated. Additional information as of the latest measurement date follows.

Measurement date:	July 1, 2021
Valuation date:	July 1, 2020
Actuarial cost method:	Entry age normal
Actuarial assumptions:	
Investment rate of return*	7.0%
Municipal bond rate	2.16%
Projected salary increases*	N/A
Cost-of-living adjustments	ad hoc
* Includes inflation at	2.50%

The actuarially determined contribution for fiscal year 2022 will use the contribution amount developed on the first page of this valuation. It was determined using the measurement date and key assumptions that follow.

Measurement date:	July 1, 2021
Valuation date:	July 1, 2021
Actuarial cost method:	Entry age normal
Amortization method:	Level dollar closed
Amortization period:	15 years remaining
Asset valuation method:	Equal to market value of assets
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 2021. The economic assumptions were updated first effective with the 2017 valuation based on the Board’s annual review of these assumptions.

The total amount of employer contributions to the Plan is composed of the unfunded actuarial liability amortization payment and the administrative expenses. Because there are no future accruals in this plan, the actuarial liability is equal to the present value of benefits. The difference between this liability and the funds accumulated as of the same date is the unfunded actuarial liability. The allowance for administrative expenses is based upon the Plan’s actual administrative expenses.

**DELAWARE CLOSED STATE POLICE PLAN  
ACTUARIAL VALUATION AS OF JUNE 30, 2021**

**APPENDIX D – RISK AND ACCOUNTING DISCLOSURE INFORMATION**

**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)*

<b>Type of Activity</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
Investment Income on Actuarial Assets	\$ (256)	\$ (279)	\$ 271	\$ 243	\$ 283	\$ 3,184
Combined Liability Experience	<u>(54)</u>	<u>9,197</u>	<u>7,598</u>	<u>147</u>	<u>\$(909)</u>	<u>3,856</u>
(Loss)/Gain during Year from Financial Experience	\$ (310)	\$ 8,918	\$ 7,869	\$ 390	\$(626)	\$ 7,040
Non-Recurring Items	<u>2,557</u>	<u>(5,447)</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>(4,231)</u>
Composite Gain (or Loss) during Year	\$ 2,247	\$ 3,471	\$ 7,869	\$ 390	\$(626)	\$ 2,809

**Schedule of Funded Liabilities by Type  
Aggregate Accrued Liabilities for**

*(expressed in thousands)*

<b>Valuation Date June 30,</b>	<b>Active Member Contributions</b>	<b>Retirees &amp; Beneficiaries</b>	<b>Active Member State-Financed Contributions</b>	<b>Actuarial Value of Reported Assets</b>	<b>Portion of Accrued Liabilities Covered by Reported Assets</b>		
					<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
					<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
2021	\$0	\$ 249,153	\$0	\$ 4,259	N/A	2%	N/A
2020	0	254,402	0	534	N/A	0	N/A
2019	0	259,046	0	1,696	N/A	1	N/A
2018	0	264,042	0	3,643	N/A	1	N/A
2017	0	275,757	0	3,085	N/A	1	N/A
2016	0	283,043	0	2,990	N/A	1	N/A