



Disability Income Plan of North Carolina

Principal Results of Actuarial Valuation as of December 31, 2021

October 27, 2022, Board of Trustees Meeting

Barry Goldberg, ASA, MAAA, FCA

Disability Income Plan

Principal December 31, 2021 Actuarial Valuation Results

Valuation results as of	December 31, 2021	December 31, 2020
Active Members		
Teachers' and State Employees' Retirement System (TSERS)	300,310	302,771
Optional Retirement Program (ORP)	<u>21,002</u>	<u>21,266</u>
Total	321,312	324,037
Reported Compensation		
TSERS	\$ 15,312,224,584	\$ 15,287,665,011
ORP	<u>2,030,862,358</u>	<u>2,193,689,991</u>
Total	\$ 17,343,086,942	\$ 17,481,355,002
Valuation Compensation ¹		
TSERS	\$ 16,627,734,686	\$ 16,423,317,494
ORP	<u>2,174,535,360</u>	<u>2,193,689,991</u>
Total	\$ 18,802,270,046	\$ 18,617,007,484
Number of beneficiaries receiving extended short-term or long-term disability benefits	4,757	5,328
Annual reported benefits	\$ 52,437,477	\$ 59,830,205

¹ Reported compensation adjusted to reflect the assumed rate of pay increase prior to the valuation date.

Disability Income Plan

Principal December 31, 2021 Actuarial Valuation Results

Asset and Liabilities as of	December 31, 2021	December 31, 2020
Assets		
Actuarial Value	\$ 321,657,532	\$ 340,568,712
Market Value	\$ 318,872,382	\$ 352,063,991
Liability for currently disabled members	\$ 235,714,341	\$ 267,847,204
Deficit/(Surplus)versus Actuarial Value	\$ (85,943,191)	\$ (72,721,508)
ADC Rate for Fiscal Year Ending (FYE)	June 30, 2024	June 30, 2023
Preliminary Actuarially Determined Contribution (ADC) Rate		
Normal Cost	0.12%	0.11%
Accrued Liability	<u>N/A</u>	<u>N/A</u>
Total	0.12%	0.11%
ADC Rate with Direct Rate Smoothing	0.11%	0.10%
Impact of Legislative Changes	<u>N/A</u>	<u>0.00%</u>
Final ADC Rate ¹	N/A	0.10%

¹ For FYE 2024, the final ADC Rate may be adjusted to reflect Plan changes or legislation that occurs after the date of this report.

Disability Income Plan

Employer Contribution Rate History

Valuation Date	Fiscal Year Ending	Preliminary ADC Rate	Change Due to Legislation	Final ADC Rate	Appropriated Rate
12/31/2021	6/30/2024	0.11% ^{1,2}	N/A	N/A	N/A
12/31/2020	6/30/2023	0.10% ²	0.00%	0.10%	0.10%
12/31/2019	6/30/2022	0.09%	0.00%	0.09%	0.09%
12/31/2018	6/30/2021	0.09%	0.00%	0.09%	0.09%
12/31/2017	6/30/2020	0.15%	(0.05%)	0.10%	0.10%
12/31/2016	6/30/2019	0.13%	0.00%	0.13%	0.14%
12/31/2015	6/30/2018	0.14%	0.00%	0.14%	0.14%
12/31/2014	6/30/2017	0.38%	0.00%	0.38%	0.38%

¹ This ADC Rate is a preliminary rate that will become the final ADC Rate if no legislation is enacted after the date that this report is issued that would affect the determination of the ADC Rate for the fiscal year ending in 2024.

² The preliminary ADC rate prior to application of direct-rate smoothing is 0.12% for fiscal year ending June 30, 2024, and 0.11% for fiscal year ending June 30, 2023.

Disability Income Plan

Reconciliation of the Actuarially Determined Contribution

Fiscal Year Ending June 30, 2023 Preliminary ADC Rate (Based on the December 31, 2020 Valuation)	0.10%
Impact of Legislative Changes	<u>0.00%</u>
Fiscal Year Ending June 30, 2023 Final ADC Rate	0.10%
Change Due to Demographic (Gain)/Loss	(0.02%)
Change Due to Updates to Actuarial Valuation ¹	0.03%
Change Due to Changes in Assumptions	0.00%
Change Due to Investment (Gain)/Loss	0.00%
Change Due to Contribution (Greater)/Less than ADC	<u>0.00%</u>
Preliminary ADC Rate	0.11%
Impact of Direct Rate Smoothing	0.00%
Impact of Legislative Changes	<u>0.00%</u>
Fiscal Year Ending June 30, 2024 Final ADC Rate (Based on the December 31, 2021 Valuation)	0.11%

¹ Since the prior valuation, a transition from the prior actuary to Buck resulted in an increase of 0.03% in the ADC rate due to valuation programming modifications and differences in methodology.

Certification

The funded status measurements included in this report are based on the assumptions and methods used to determine the Plan's obligations and asset values as of the valuation and/or measurement date. Funded status measurements for financial accounting purposes may not be appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. Likewise, funded status measurements for financial accounting purposes may not be appropriate for assessing the need for or the amount of future actuarially determined contributions. Funded status measurements would also be different if the market value of assets was used in these calculations instead of an actuarial value of assets.

Buck Global, LLC does not provide legal, investment, or accounting advice. Thus, the information in this report is not intended to supersede or supplant the advice and interpretations of the System, OSC, or their legal, investing, or accounting partners.

The undersigned are familiar with the near-term and/or long-term aspects of other postemployment benefit plan valuations and collectively meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained in this report. All sections of this report, including any appendices and attachments, are considered an integral part of the actuarial opinions.

Certification

This report has been prepared in accordance with Actuarial Standard of Practice No. 6, as well as all other applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Barry Goldberg, ASA, MAAA, FCA

June Clark, ASA, MAAA, FCA





Disability Income Plan of North Carolina

Report on the Actuarial Valuation
Prepared as of December 31, 2021

October 2022



110 West Berry Street
Suite 1300
Fort Wayne, IN 46802

October 14, 2022

Board of Trustees
Teachers' and State Employees' Retirement System of North Carolina
3200 Atlantic Avenue
Raleigh, NC 27604

Members of the Board:

This report presents the results of the actuarial valuation of the Disability Income Plan of North Carolina (referred to as "DIPNC", "Disability Income Plan", or "Plan"), prepared as of December 31, 2021. Information contained in our report for plan years prior to December 31, 2021, is based upon valuations performed by the prior actuarial firm.

The primary purpose of the valuation report is to provide the actuarially determined employer contribution rates for DIPNC during the fiscal year ending on June 30, 2024, to describe the current financial condition of DIPNC, to analyze changes in such condition, and to summarize the census data, financial information, assumptions, methods, and plan provisions used to prepare these results.

In addition, the report contains information that will be used by the Office of the State Controller (OSC) in its Annual Comprehensive Financial Report and provides the DIPNC information required under Governmental Accounting Standards Board (GASB) Statement No. 74 for the fiscal year ending on June 30, 2022 based on a valuation date of December 31, 2021.

Additional Information and Disclosures

The information contained in this report is intended to be used by the Board of Trustees for the Teachers' and State Employees' Retirement System of North Carolina (System) for Plan funding purposes for the fiscal year ending on June 30, 2024 and Plan accounting purposes for the fiscal year ending on June 30, 2022, and its use for other purposes may not be appropriate. Calculations for purposes other than funding the DIPNC benefits described in this report or reporting the Plan accounting information required under GASB 74, may produce significantly different results.

This report may also be used in conjunction with other materials for the purposes of auditing the Plan. However, the use of this report for any other purposes or by any parties other than the System, OSC, and its auditors may not be appropriate and may result in mistaken conclusions because of a failure to appreciate the limitations of census and financial data, understand applicable assumptions and methods, or correctly identify situations that would render the report inappropriate for a given purpose. The attached pages should not be provided without a copy of this cover letter. Because of the risk of misinterpretation of actuarial results, you should ask Buck Global, LLC (Buck) to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without prior review.

The results contained in this report were prepared by qualified actuaries according to generally accepted actuarial principles and practices, and in compliance with Actuarial Standards of Practice issued by the Actuarial Standards Board. Our understanding is that the System has made no changes to the Plan's funding policy since the prior valuation. Thus, actuarially determined employer contribution (ADC) rates as of the valuation date were developed based on the contribution allocation procedure described in GASB Statement Nos. 43 and 45, as approved by the System during prior periods. The financial accounting information provided in this report reflects our current understanding of GASB 74, including any applicable guidance provided by the System, or its audit partners as of the date of this report.

The measurement of Plan obligations used as the basis for much of the information presented in this report was performed as of December 31, 2021 ("the valuation date") based on the following information provided by the System for valuation purposes:

- Census data for active and disabled members as of December 31, 2021
- Current plan provisions, including changes since December 31, 2020
- Pertinent financial information as of December 31, 2021; and,
- Unaudited financial information as of June 30, 2022.

This information is summarized throughout this report. We did not audit the supplied information, but it was reviewed for reasonableness and consistency. In certain situations, the supplied information was adjusted to account for normal differences in collection dates and/or methods. As a result, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it is reliable for the purposes stated herein. The results and conclusions contained in this report depend on the integrity of this information, and if any of the supplied information or analyses change, our results and conclusions may be different, and this report may need to be revised. Likewise, this report may need to be revised to reflect any significant event that affects the Plan after the valuation date.

Valuation results as of December 31, 2021 are based on the assumptions and methods adopted by the Board on January 28, 2021 and prescribed for use in the Plan's December 31, 2020 annual actuarial valuation, which are summarized in various sections of this report. All GASB 74 assumptions including, but not limited to, discount rates and expected rates of return on assets, have been selected by the System's governing bodies for the measurement of the Plan's benefit obligations as of June 30, 2022 based on the December 31, 2021 valuation date, and should reflect best estimates of anticipated Plan experience. We have evaluated the assumptions and methods prescribed by the Board and believe that they are reasonable for the purposes of preparing the measurements described above. We will continue to monitor material assumptions.

The actuarial cost method and the asset valuation method used for funding purposes were selected by the System during prior periods and prescribed for use beginning with the Plan's December 31, 2021 annual actuarial valuation. We believe that these methods are appropriate for funding purposes. Additionally, the actuarial cost method, the asset valuation method, and the amortization methods are prescribed under GASB rules for financial accounting purposes as of the June 30, 2021 and June 30, 2022 measurement dates. Actuarial methods such as the actuarial cost methods, asset valuation methods, and amortization methods used in the contribution allocation procedure (for funding purposes) and cost allocation procedure (for financial accounting purposes) are designed to recognize changes in an orderly fashion over a period of years. In certain situations, the actuarial methods used in an allocation procedure may have the effect of deferring changes in contributions or costs into later years. Likewise, the use of these methods could produce deferred gains or losses if any material underlying assumption is not met over a long period of time.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: retiree group benefits program experience differing from that anticipated by the assumptions; changes in assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in retiree group benefits program provisions or applicable law. Retiree group benefits models necessarily rely on the use of approximations and estimates and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, we have not performed an analysis of the potential range of such future differences other than the sensitivity to changes in the discount rate required by GASB 74. This report does not consider all possible scenarios.

Actuarial Standard of Practice No. 56 ("ASOP 56") provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses in-house and third-party software in the performance of annual actuarial valuations and projections. The models are intended to calculate the liabilities associated with the provisions of the plan using data and assumptions as of the measurement date under the accounting standards specified in this report. Further, the models apply those accounting standards to the liabilities derived and other inputs, such as plan assets and contributions, to generate the calculations found in this report. Buck has an extensive review process whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other accounting outputs are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. Buck also reviews the models when significant changes are made to the software. The review is performed by experts within the company who are familiar with applicable accounting rules as well as the manner in which the models generate their output.

The funded status measurements included in this report are based on the assumptions and methods used to determine the Plan's obligations and asset values as of the valuation and/or measurement date. Funded status measurements for financial accounting purposes may not be appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations. Likewise, funded status measurements for financial accounting purposes may not be appropriate for assessing the need for or the amount of future actuarially determined contributions. Funded status measurements would also be different if the market value of assets was used in these calculations instead of an actuarial value of assets.

Buck Global, LLC does not provide legal, investment, or accounting advice. Thus, the information in this report is not intended to supersede or supplant the advice and interpretations of the System, OSC, or their legal, investing, or accounting partners.

The undersigned are familiar with the near-term and/or long-term aspects of other postemployment benefit plan valuations and collectively meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained in this report. All sections of this report, including any appendices and attachments, are considered an integral part of the actuarial opinions.

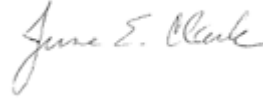
We are available to answer questions about this report or the information provided herein.

Respectfully submitted,

Buck Global, LLC (Buck)



Barry J. Goldberg, ASA, MAAA, FCA
Principal, Health



June Clark, ASA, MAAA
Sr. Actuarial Consultant, Health

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Section 1: Introduction

This report presents the results of the actuarial valuation of the Disability Income Plan of North Carolina, prepared as of December 31, 2021. The purpose of the valuation is to determine the present value of future payments to disabled members as of December 31, 2021, to determine the expected cost of new claims for 2021, to provide the actuarially determined employer contribution (ADC) rate based on the System's funding policy, which is centered on the guidance provided in GASB Statements No. 43 and 45, and to provide the financial accounting information required under GASB Statement No. 74 for postemployment benefits.

Appendix A presents detailed tabulations of the active membership of the Plan as of the valuation date.

Appendix B presents detailed tabulations of the disabled membership of the Plan as of the valuation date.

Appendix C presents the development of the Actuarial Value of Assets.

Appendix D provides the full set of actuarial assumptions and methods employed for funding purposes.

The valuation was based on provisions of the Plan as amended through June 30, 2022. A summary of the main Plan provisions used for valuation purposes appears in Appendix E.

Appendices F and G of this report present the projection of the Plan's fiduciary net position and present value of benefits required under GASB 74.

Section 2: Principal Results

The table below provides the principal results of the valuation and a comparison with the preceding year's results.

Table 1: Summary of Principal Results

Valuation Results as of	December 31, 2021	December 31, 2020
Active Members		
Teachers' and State Employees' Retirement System (TSERS)	300,310	302,771
Optional Retirement Program (ORP)	<u>21,002</u>	<u>21,266</u>
Total	321,312	324,037
Reported Compensation		
TSERS	\$ 15,312,224,584	\$ 15,287,665,011
ORP	<u>2,030,862,358</u>	<u>2,193,689,991</u>
Total	\$ 17,343,086,942	\$ 17,481,355,002
Valuation Compensation*		
TSERS	\$ 16,627,734,686	\$ 16,423,317,494
ORP	<u>2,174,535,360</u>	<u>2,193,689,991</u>
Total	\$ 18,802,270,046	\$ 18,617,007,484
Number of beneficiaries receiving extended short term or long-term disability benefits	4,757	5,328
Annual reported benefits	\$ 52,437,477	\$ 59,830,205
Asset and Liabilities as of	December 31, 2021	December 31, 2020
Assets		
Actuarial Value	\$ 321,657,532	\$ 340,568,712
Market Value	\$ 318,872,382	352,063,991
Liability for currently disabled members	\$ 235,714,341	\$ 267,847,204
Deficit/(Surplus) versus Actuarial Value	\$ (85,943,191)	\$ (72,721,508)
ADC Rate for Fiscal Year Ending (FYE)	June 30, 2024	June 30, 2023
Preliminary Actuarially Determined Contribution (ADC) Rate		
Normal Cost	0.12%	0.11%
Accrued Liability	<u>N/A</u>	<u>N/A</u>
Total	0.12%	0.11%
ADC Rate with Direct Rate Smoothing	0.11%	0.10%
Impact of Legislative Changes	<u>N/A</u>	<u>N/A</u>
Final ADC Rate**	N/A	N/A

* Reported compensation adjusted to reflect the assumed rate of pay increase prior to the valuation date.

** For FYE 2024, the final ADC Rate may be adjusted to reflect Plan changes or legislation that occurs after the date of this report.

Section 2: Principal Results (continued)

Table 2: Reconciliation of Change in Actuarially Determined Contribution (ADC)

Fiscal Year Ending June 30, 2023 Preliminary ADC Rate (Based on the December 31, 2020 Valuation)	0.10%
Impact of Legislative Changes	<u>0.00%</u>
Fiscal Year Ending June 30, 2023 Final ADC Rate	0.10%
Change Due to Demographic (Gain)/Loss	(0.02%)
Change Due to Updates to Actuarial Valuation*	0.03%
Change Due to Changes in Assumptions	0.00%
Change Due to Investment (Gain)/Loss	0.00%
Change Due to Contribution (Greater)/Less than ADC	<u>0.00%</u>
Preliminary ADC Rate	0.11%
Impact of Direct Rate Smoothing	0.00%
Impact of Legislative Changes	<u>0.00%</u>
Fiscal Year Ending June 30, 2024 Final ADC Rate (Based on the December 31, 2021 Valuation)	0.11%

* Since the prior valuation, a transition from the prior actuary to Buck resulted in an increase of 0.03% in the ADC rate due to valuation programming modifications and differences in methodology. The main driver of this increase was a change in methodology. The prior valuation assumed that all future disabled members would take one year of Extended STD benefits. However, after discussing this assumption with NC Retirement System personnel, it was agreed that it is more reasonable to assume that no future disabled members go through the Extended STD, because only a healthy subset of disabled people go into the Extended STD.

Section 2: Principal Results (continued)

Table 3: History of Actuarially Determined contribution (ADC) Rates and Appropriated Rates

Valuation Date	Fiscal Year Ending	Preliminary ADC Rate	Change Due to Legislation	Final ADC Rate	Appropriated Rate
12/31/2021	6/30/2024	0.11% ^{1,2}	N/A	N/A	N/A
12/31/2020	6/30/2023	0.10% ²	0.00%	0.10%	0.10%
12/31/2019	6/30/2022	0.09%	0.00%	0.09%	0.09%
12/31/2018	6/30/2021	0.09%	0.00%	0.09%	0.09%
12/31/2017	6/30/2020	0.15%	(0.05%)	0.10%	0.10%
12/31/2016	6/30/2019	0.13%	0.00%	0.13%	0.14%
12/31/2015	6/30/2018	0.14%	0.00%	0.14%	0.14%
12/31/2014	6/30/2017	0.38%	0.00%	0.38%	0.38%

¹ This ADC Rate is a preliminary rate that will become the final ADC Rate if no legislation is enacted after the date that this report is issued that would affect the determination of the ADC Rate for the fiscal year ending in 2024.

² The preliminary ADC rate prior to application of direct-rate smoothing is 0.12% for fiscal year ending June 30, 2024, and 0.11% for fiscal year ending June 30, 2023.

Section 2: Principal Results (continued)

The table below provides the schedule of funding progress, which presents multi-year trend information about whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liability for benefits.

The aggregate cost method used for Plan funding purposes does not identify or separately amortize unfunded liabilities. Thus, information about the Plan's funded status and funding progress have been prepared using the entry age normal (level percentage of pay) actuarial cost method as an approximation.

Table 4: Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Entry Age Actuarial Liability (AAL) (b)	Unfunded AAL (UAAL) (b) – (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) – (a)] / (c)
12/31/13	442,422,332	522,940,655	80,518,323	84.6%	14,294,017,494	0.56%
12/31/14	450,598,573	503,060,332	52,461,759	89.6%	14,459,666,607	0.36%
12/31/15	439,955,539	395,950,392	(44,005,147)	111.1%	14,718,736,311	(0.30%)
12/31/16	442,086,171	392,674,478	(49,411,693)	112.6%	15,178,136,876	(0.33%)
12/31/17	424,219,638	383,166,480	(41,053,158)	110.7%	15,763,887,688	(0.26%)
12/31/18	389,599,221	345,399,709	(44,199,512)	112.8%	16,329,558,053	(0.27%)
12/31/19	361,335,426	326,431,066	(34,904,360)	110.7%	16,933,847,753	(0.21%)
12/31/20	340,568,712	323,115,513	(17,453,199)	105.4%	17,481,355,002	(0.10%)
12/31/21	321,657,532	320,183,088	(1,474,444)	100.5%	17,343,086,942	(0.01%)

Please note that the funded status measures shown above do not indicate whether or not the Plan would have sufficient assets if it were terminated, nor do they indicate what level of future contributions would be required.

Section 3: Membership Data

Data for 300,310 active members of the Teachers' and State Employees' Retirement System with reported compensation of \$15,312,224,584 and 21,002 members of the Optional Retirement Program with reported compensation of \$2,030,862,358 were furnished by the Retirement Systems Division as of December 31, 2021. The reported compensation includes annual longevity payments. The number and reported compensation of active members distributed by age and service as of December 31, 2021, are shown in Appendix A.

The contributory membership service requirement for short-term disability benefits under the Plan is one year and the contributory membership service requirement for long-term disability benefits under the Plan is five years.

The Retirement Systems Division also supplied data for 4,757 disabled employees in receipt of annual extended short-term and long-term disability benefits totaling \$52,437,477 as of the valuation date. Of this number, 47 disabled employees are grandfathered under all provisions of the prior Disability Salary Continuation Plan and 4,710 are receiving extended short-term and long-term disability benefits under the provisions of this Plan. Appendix B presents a comparison of the number and annual amount of benefits payable as of the current and previous valuation dates.

Section 4: Assets

Asset information taken into account in this valuation is based principally on information reported by the Retirement Systems Division. The market value of assets for the Plan is \$318,872,382 as of December 31, 2021.

The Actuarial Value of Assets for the Plan is \$321,657,532 as of the valuation date based on the “five-year smoothed value” asset valuation method selected by the System. Under this method, investment gains and losses are recognized in equal portions over a five-year period. The development of the Actuarial Value of Assets as of the valuation date is provided in Appendix C.

The following table shows an allocation of investments by category as of December 31, 2021.

Table 5: Allocation of Investments by Category as of December 31, 2021

Cash and Receivables	8.4%
Fixed income (LTIF)	91.6%
Public Equity	0.0%
Other*	<u>0.0%</u>
Total	100.0%

* Real Estate, Alternatives, Inflation, and Credit.

Section 5: Condition of the Plan

The following table shows the assets and liabilities of the Plan as of the current valuation date of December 31, 2021. The items shown in the table, other than the actuarial value of assets, are present values actuarially determined as of the valuation date.

Table 6: Statement of Condition of the Plan as of December 31, 2021

Present value of prospective benefits payable to all disabled members as of the valuation date for:	
Extended STD and LTD approved claims	\$ 201,215,353
LTD incurred but not reported claims	34,498,988
STD incurred but not reported claims	-
Total claim liability	<u>\$ 235,714,341</u>
Actuarial Valuation of Assets at end of year	\$ 321,657,532
Deficit/(Surplus) as of December 31, 2021	\$ (85,943,191)
Prospective present value of benefits for current active members	\$ 281,821,380
Present value of benefits not covered by Actuarial Value of Assets	\$ 195,878,189
Present value of future compensation for active members	\$177,327,665,651
Level contribution as a percentage of compensation to fund present value of benefits not covered by Actuarial Value of Assets	0.11%
Estimated administrative expenses	<u>0.01%</u>
Preliminary actuarially determined contribution rate as of December 31, 2021	0.12%
Actuarially determined contribution rate as of December 31, 2021 with Direct Rate Smoothing	0.11%

Claim liabilities are equal to the present value of future claim payments that the Plan is obligated to make to members who are disabled as of the valuation date. The claim liabilities are separated into two classifications, which reflect the status of each claim as of the valuation date.

- (a) Approved claim liabilities are for extended short-term and long-term disabilities which have occurred, have been approved, and are in payment status as of the valuation date.
- (b) LTD incurred but not reported liabilities are for disabilities which have occurred but are not in payment status as of the valuation date. These liabilities are estimated based on the one-year term cost for expected disablements during the year following the valuation date and a reserve of 14/12 of the term cost is added to account for the time after disability to receive LTD benefits.

Since the prior valuation, a transition from the prior actuarial firm to Buck resulted in an increase in the present value of future benefits of \$45 million due to valuation programming modifications and differences in methodology. \$39 million of this increase was due to the change from assuming that all future disabled members would take one year of Extended STD benefits to assuming that no future disabled members go through the Extended STD.

The method of determining claim liabilities and the assumptions used are described in Appendix D.

Section 6: Experience

Section 5 shows that the surplus under the Plan has increased by \$13,221,683 from \$72,721,508 to \$85,943,191 since the previous valuation date.

The following table shows a detailed reconciliation of the change in the Plan's Deficit / (Surplus)—the difference between the Total Claim Liability and the Actuarial Value of Assets— since the prior valuation.

Table 7: Reconciliation of Change in Deficit/(Surplus) Since the Prior Valuation

Prior Year Deficit/ (Surplus)	\$ (72,721,508)
Actual Contributions During the Period	(16,344,741)
Receivable Contributions	0
Interest Adjustment	(2,425,005)
IBNR Experience	(9,357,422)
Extended STD Experience	1,175,505
Demographic Experience	(24,327,037)
Asset Loss/ (Gain)*	1,180,816
Actuarial Transition	2,377,213
Assumption Changes	0
Current Year IBNR Claims	<u>34,498,988</u>
Current Year Deficit/(Surplus)	\$ (85,943,191)

* The Plan's Actuarial Value of Assets is the basis for the asset (gain)/loss reported above.

Section 7: Accounting Information

This section contains the accounting information for GASB 74 for the fiscal year ending on June 30, 2022, based on a December 31, 2021 valuation date. The Plan is assumed to be a cost-sharing, other than insured, defined benefit OPEB plan without a special funding situation where assets are accumulated in a trust that meets the criteria outlined in paragraph 3 of GASB 74. Additionally, the System elected not to restate results for any period prior to the adoption of GASB 74.

The June 30, 2022 total OPEB liability presented in this section was determined by an actuarial valuation as of December 31, 2021, based on the assumptions, methods and plan provisions described in this report. The actuarial cost method used to develop the total OPEB liability is the Entry Age Normal Cost method, as required by GASB Statement No. 74.

GASB Statement No. 74 set forth certain items of information to be disclosed in the financial statements of the Plan. The tables below provide a distribution of the number of employees by type of membership.

Table 8: Number of Active and Disabled Participants as of December 31, 2021

Membership Group	Number
Disabled members currently receiving extended short-term and long-term disability benefits	4,757
Inactive plan members entitled to, but not currently receiving benefits	0
Active members, including those in the waiting period or on short-term disability	<u>321,312</u>
Total membership	326,069

A 3.08% discount rate was used to measure the Plan's Total OPEB Liability as of June 30, 2022. The projection of cash flows used to determine the discount rate assumed that System contributions will continue to follow the current funding policy. Based on those assumptions, the Plan's fiduciary net position (PFNP) was projected to be available to make all projected future benefit payments to current Plan members. Please see Appendices F and G for additional details.

Section 7: Accounting Information (continued)

GASB Statement No. 74 set forth certain items of information to be disclosed in the financial statements of the Plan. The tables below provide the reconciliation of changes in the Net OPEB Liability / (Asset) (NOL).

Table 9: Reconciliation of Changes in Net OPEB Liability / (Asset)

Fiscal Year Ending On	June 30, 2022
Total OPEB Liability	
Service Cost	\$ 22,246,000
Interest	9,528,000
Changes in Benefit Terms	0
Difference Between Expected and Actual Experience	1,735,000
Changes of Assumptions or Other Inputs	(552,000)
Net Benefit Payments	<u>(40,381,000)</u>
Net Change in Total OPEB Liability	\$ (7,424,000)
Total OPEB Liability — Beginning of Year	\$ 315,388,000
Total OPEB Liability — End of Year	\$ 307,964,000
Plan Fiduciary Net Position	
Employer Contributions	\$ 17,019,000
Member Contributions	N/A
Net Investment Income	(29,145,000)
Net Benefit Payments	(40,381,000)
Administrative Expenses	(999,000)
Other	<u>0</u>
Net Change in Plan Fiduciary Net Position	\$ (53,506,000)
Plan Fiduciary Net Position — Beginning of Year	\$ 331,722,000
Plan Fiduciary Net Position — End of Year	\$ 278,216,000

Section 7: Accounting Information (continued)

Table 10: Schedule of the Net OPEB Liability / (Asset)

Measurement Date as of	June 30, 2022	June 30, 2021
Total OPEB Liability	\$ 307,964,000	\$ 315,388,000
Plan Fiduciary Net Position	<u>278,216,000</u>	<u>331,722,000</u>
Net OPEB Liability (Asset)	\$ 29,748,000	\$ (16,334,000)
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability (Asset)	90.34%	105.18%
Covered Payroll	\$ 18,909,461,000	\$ 18,028,883,000
Net OPEB Liability (Asset) as a Percentage of Covered Payroll	0.16%	(0.09%)

The sensitivity of the NOL to changes in the discount rate must be disclosed under GASB 74. The table below provides the NOL of the Plan determined using the current discount rate of 3.08%, as well as what the Plan's NOL would be if the discount rate was 1-percentage-point lower or 1-percentage-point higher than the current rate:

Table 11: Sensitivity of the Net OPEB Liability / (Asset) as of June 30, 2022 to Changes in the Discount Rate

	1% Decrease	Current	1% Increase
Discount Rate	2.08%	3.08%	4.08%
Net OPEB Liability (Asset)	\$36,631,000	\$29,748,000	\$22,848,000

A 3.08% discount rate was used to measure the Plan's Total OPEB Liability as of June 30, 2022. The projection of cash flows used to determine the discount rate assumed that System contributions will continue to follow the current funding policy. Based on those assumptions, the Plan's fiduciary net position (PFNP) was projected to be available to make all projected future benefit payments to current Plan members. Investment earnings are based on actual returns through June 30, 2022, and on the assumed investment rate of return thereafter. After the fund is depleted, contributions are assumed not to increase the fund balance above \$0.

Based on those assumptions, and the assumed investment return of 3.00% used in the actuarial valuation as of December 31, 2021, the System's fiduciary net position was not projected to be available to make all projected future benefit payments of current plan members. In order to develop the blended GASB discount rate of 3.08%, 3.00% was used during the period that the Plan was projected to have a fiduciary net position that is higher than expected benefit payments, and a municipal bond rate of 3.54% was used during the period that the Plan was projected to have a fiduciary net position that is lower than expected benefit payments. The 3.54% rate is based on the Bond Buyer 20-Bond GO Index as of June 30, 2022. Please see Appendices F and G for additional details.

Section 7: Accounting Information (continued)

The table below provides a reconciliation of the preliminary employer actuarially determined contribution rate to the final actuarially determined contribution amount for fiscal year ending on June 30, 2022. The preliminary actuarially determined contribution rate is based on the Plan's actuarial valuation as of December 31, 2019.

Table 12: Development of the Actuarially Determined Contribution Amount for the Fiscal Year Ending June 30, 2022

Fiscal Year Ending	June 30, 2022
Preliminary Actuarially Determined Contribution Rate	
Normal Cost	0.09%
Accrued Liability	<u>N/A</u>
Total	0.09%
Impact of Legislative Changes	<u>0.00%</u>
Final Actuarially Determined Contribution Rate	0.09%
Actual Payroll for Year Ending June 30, 2022	18,909,461,000
Actuarially Determined Contribution	17,018,515

The tables below provide the actuarially determined contribution (ADC) rate for the employer as a percentage of payroll, determined in accordance with the Plan's funding policy, and a summary of the key assumptions and methods used in the determination of the ADC rate.

Table 13: Fiscal Year Ending June 30, 2024 Actuarially Determined Contribution (ADC) Rate based on the Valuation as of December 31, 2021

ADC Rate Component	Rate
Normal Cost	0.11%
Accrued Liability	<u>N/A</u>
Total	0.11%

* The preliminary ADC rate prior to application of direct-rate smoothing is 0.12% for fiscal year ending June 30, 2024.

Section 7: Accounting Information (continued)

Table 14: Additional Information about the Determination of the Fiscal Year Ending June 30, 2024 ADC Rate for GASB 74 Disclosures

Valuation Date	12/31/2021
Actuarial Cost Method	Aggregate
Amortization Method	Level percent of pay
Amortization Period	The aggregate cost method does not identify or separately amortize unfunded liabilities.
Asset Valuation Method	Asset returns in excess of or less than the expected return on market value of assets reflected over a five-year period (not greater than 120% of market value and not less than 80% of market value).
Actuarial Assumptions:	
Investment Rate of Return*	3.00%
Projected Salary Increases**	3.25% - 8.05%
*Includes Inflation of	2.50%
**Includes Inflation and Productivity of	3.25%
Cost-of-living Adjustments	3.25% for gross long-term disability benefits. Disabilities that occurred before January 1, 1988 do not have cost-of-living adjustments.
Expected Administrative Expenses Included in Normal Cost	0.01% of payroll

Appendix A: Detailed Tabulation of Active Member Data

Table A-1: Number and Average Reported Compensation of Active Members Distributed by Age and Service as of December 31, 2021

Age	Creditable Service										Total	
	Under 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40& over		
Under 25	5,467	4,859	30	-	-	-	-	-	-	-	-	10,356
	\$16,016	\$ 38,999	\$ 36,803									\$ 26,861
25-29	5,225	16,067	4,980	9	-	-	-	-	-	-	-	26,281
	\$17,713	\$ 42,231	\$ 47,154	\$ 60,418								\$ 38,296
30-34	4,119	12,008	14,430	3,378	30	-	-	-	-	-	-	33,965
	\$19,210	\$ 47,579	\$ 50,709	\$ 55,350	\$ 48,474							\$ 46,242
35-39	3,166	9,974	10,324	9,922	4,030	29	-	-	-	-	-	37,445
	\$19,728	\$ 52,538	\$ 56,960	\$ 59,879	\$ 62,280	\$ 54,965						\$ 53,979
40-44	2,705	8,529	9,058	7,293	10,636	3,534	21	-	-	-	-	41,776
	\$19,215	\$ 51,213	\$ 59,407	\$ 63,903	\$ 65,352	\$ 65,697	\$ 57,136					\$ 57,961
45-49	2,301	7,588	8,175	6,886	8,044	9,305	2,828	8	-	-	-	45,135
	\$18,656	\$ 49,785	\$ 55,785	\$ 63,856	\$ 65,426	\$ 67,501	\$ 69,538	\$ 64,891				\$ 59,112
50-54	2,171	7,002	7,838	7,281	8,597	7,620	7,174	897	9	-	-	48,589
	\$18,691	\$ 49,369	\$ 53,511	\$ 59,193	\$ 63,232	\$ 65,857	\$ 71,666	\$ 74,270	\$ 65,204			\$ 58,932
55-59	1,644	5,498	6,238	6,022	7,334	6,390	4,353	1,558	220	3		39,260
	\$19,143	\$ 49,019	\$ 51,259	\$ 55,771	\$ 57,905	\$ 62,804	\$ 68,192	\$ 75,546	\$ 71,169	*		\$ 56,367
60-64	882	3,520	4,465	4,162	5,007	4,313	2,348	1,113	498	89		26,397
	\$19,143	\$ 47,795	\$ 51,919	\$ 56,165	\$ 57,201	\$ 61,337	\$ 72,108	\$ 84,885	\$ 85,282	\$ 68,719		\$ 57,356
65-69	337	1,091	1,630	1,477	1,492	1,093	707	475	274	174		8,750
	\$16,663	\$ 48,696	\$ 54,805	\$ 60,568	\$ 63,224	\$ 68,483	\$ 81,216	\$ 105,894	\$ 111,662	\$ 90,780		\$ 64,095
70 & over	157	454	546	522	559	367	230	180	143	200		3,358
	\$12,992	\$ 43,180	\$ 48,343	\$ 53,243	\$ 63,712	\$ 76,252	\$ 89,048	\$ 113,880	\$ 145,859	\$ 123,569		\$ 67,297
Total	28,174	76,590	67,714	46,952	45,729	32,651	17,661	4,231	1,144	466		321,312
	\$18,215	\$ 47,449	\$ 53,705	\$ 59,747	\$ 62,509	\$ 65,309	\$ 71,119	\$ 82,750	\$ 96,301	\$ 100,491		\$ 53,976

* To protect the privacy of beneficiary information, total reported compensation is not shown for groups with fewer than 5 individuals.

Appendix A: Detailed Tabulation of Active Member Data (continued)

Table A-2: Number and Reported Compensation of Active Members Distributed by Age and Gender as of December 31, 2021

Age	Male		Female	
	Number	Compensation	Number	Compensation
Under 19	9	\$ 71,325	19	\$ 114,846
19	60	1,074,927	68	940,928
20	111	1,838,823	162	2,194,225
21	224	4,966,910	446	7,814,181
22	516	12,410,614	1,483	28,540,877
23	845	24,421,399	2,488	67,950,003
24	1,034	33,786,820	2,891	92,037,015
25	1,258	44,809,635	3,295	114,653,508
26	1,374	51,921,919	3,501	125,888,942
27	1,552	60,522,373	3,672	138,780,062
28	1,639	68,063,519	4,005	156,644,504
29	1,697	71,926,089	4,288	173,240,675
30	1,887	83,416,546	4,442	187,383,156
31	1,991	91,775,920	4,805	210,174,080
32	2,094	103,640,424	4,826	219,766,569
33	2,071	105,583,347	4,844	225,538,014
34	2,116	111,241,823	4,889	232,083,942
35	2,169	122,645,461	4,784	236,090,676
36	2,231	127,833,621	5,069	255,344,172
37	2,280	134,386,368	5,156	267,381,680
38	2,417	148,367,940	5,226	275,019,860
39	2,485	153,670,167	5,628	300,501,921
40	2,395	150,902,464	5,699	306,866,553
41	2,539	162,672,309	5,783	317,559,837
42	2,494	163,275,707	5,942	328,439,144
43	2,497	162,319,879	5,756	321,173,664
44	2,510	165,945,142	6,161	342,224,590
45	2,578	172,787,414	5,988	333,504,367
46	2,554	171,485,673	6,057	336,567,946
47	2,743	182,364,243	6,315	352,122,922
48	2,770	186,461,404	6,463	360,149,599
49	2,981	200,105,137	6,686	372,448,015
50	3,076	208,082,739	7,268	402,873,276
51	3,170	214,406,195	7,473	416,764,060
52	2,973	202,992,125	6,890	384,264,846
53	2,762	190,753,629	6,295	345,187,717
54	2,614	176,105,777	6,068	322,008,888
55	2,517	170,436,674	5,643	294,940,875
56	2,578	171,334,842	5,386	281,753,686
57	2,445	159,086,849	5,421	283,853,392

* To protect the privacy of beneficiary information, total reported compensation is not shown for groups with fewer than 5 individuals.

Appendix A: Detailed Tabulation of Active Member Data (continued)

Table A-2: Number and Reported Compensation of Active Members Distributed by Age and Gender as of December 31, 2021 (continued)

Age	Male		Female	
	Number	Compensation	Number	Compensation
58	2,463	\$ 163,876,921	5,240	\$ 269,184,856
59	2,367	152,124,035	5,200	266,385,534
60	2,180	134,834,873	4,724	241,547,600
61	2,051	136,937,648	4,132	216,072,765
62	1,749	117,133,578	3,361	177,574,516
63	1,514	105,532,424	2,920	154,507,113
64	1,396	100,643,821	2,370	129,241,729
65	1,082	77,516,029	1,770	99,387,266
66	817	60,047,577	1,251	71,340,760
67	675	52,446,045	882	49,071,507
68	558	45,053,292	707	39,890,445
69	467	34,941,079	541	31,131,928
70	396	31,909,147	424	23,685,634
71	293	23,803,387	313	17,572,503
72	244	17,573,010	215	9,947,789
73	202	16,333,801	172	8,442,706
74	163	13,635,910	143	7,922,579
75	128	10,115,872	93	4,975,452
76	93	8,472,624	59	2,710,949
77	58	5,077,172	52	2,308,698
78	53	4,170,260	43	2,100,724
79	47	4,166,712	29	1,260,187
80	25	2,481,035	12	503,811
81	16	1,066,613	11	304,934
82	15	938,490	9	576,746
83	12	1,075,440	3	*
84	8	601,469	2	*
85	4	*	2	*
86	3	*	2	*
87	1	*	1	*
88	4	*	1	*
89	1	*	2	*
90	-	-	1	*
91	2	*	-	-
92	-	-	-	-
93	-	-	-	-
94	-	-	-	-
95	-	-	-	-
Over 95	-	-	1	*
Total	99,343	\$ 6,094,002,121	221,969	\$ 11,249,084,820

* To protect the privacy of beneficiary information, total reported compensation is not shown for groups with fewer than 5 individuals.

Appendix A: Detailed Tabulation of Active Member Data (continued)

Table A-3: Number and Reported Compensation of Active Members Distributed by Service and Gender as of December 31, 2021

Service	Male		Female	
	Number	Compensation	Number	Compensation
1	7,825	163,038,239	20,349	350,150,881
2	5,842	295,180,489	13,510	577,787,857
3	6,557	351,616,324	14,871	651,202,738
4	5,940	326,000,165	12,997	589,240,399
5	5,338	297,119,019	11,535	545,937,537
6	5,168	295,417,845	10,995	530,577,893
7	4,608	273,694,384	9,463	476,352,580
8	4,160	247,047,363	8,966	457,479,191
9	3,966	244,104,206	8,319	441,935,975
10	3,873	237,157,583	8,196	432,813,201
11	2,951	190,348,905	6,234	349,190,113
12	3,181	205,321,309	6,294	352,828,005
13	2,003	135,279,218	4,873	282,045,876
14	3,244	219,401,885	7,045	402,060,138
15	3,384	226,818,443	7,743	441,945,813
16	3,279	226,251,697	7,665	448,550,750
17	2,968	205,410,594	7,008	413,324,903
18	2,775	191,902,373	6,693	392,528,806
19	2,530	179,206,747	5,737	344,595,410
20	2,050	148,494,870	5,024	308,189,306
21	2,102	157,110,703	5,090	307,411,527
22	2,062	150,856,836	5,135	310,451,880
23	1,993	152,616,876	4,859	298,102,223
24	1,790	137,323,372	4,314	265,421,674
25	1,633	124,002,966	3,673	229,096,103
26	1,424	110,756,777	3,284	210,149,971
27	1,294	101,395,224	2,742	179,088,467
28	1,218	98,097,329	2,377	159,997,753
29	1,080	89,898,376	2,032	136,818,202
30	756	67,512,312	1,454	102,317,934
31	448	41,662,045	724	51,799,798
32	415	39,334,946	654	48,839,257
33	350	35,540,469	519	37,969,902
34	245	25,788,422	400	28,884,172
35	185	18,742,981	291	21,552,600

* To protect the privacy of beneficiary information, total reported compensation is not shown for groups with fewer than 5 individuals.

Appendix A: Detailed Tabulation of Active Member Data (continued)

Table A-3: Number and Reported Compensation of Active Members Distributed by Service and Gender as of December 31, 2021 (continued)

Service	Male		Female	
	Number	Compensation	Number	Compensation
36	138	\$ 15,184,326	183	\$ 14,734,015
37	116	12,524,501	167	13,097,097
38	87	10,036,036	137	11,343,268
39	76	9,560,961	97	7,504,787
40	70	9,385,980	73	6,796,945
41	38	4,693,963	51	4,045,184
42	44	5,310,873	29	1,969,239
43	26	3,151,492	36	2,669,219
44	25	3,423,167	37	2,996,326
45	25	3,898,408	29	2,027,531
46	11	1,606,803	14	1,264,725
47	13	1,648,276	12	1,223,135
48	10	1,188,117	10	773,554
49	4	*	7	499,395
50	7	695,084	4	*
51	3	*	5	422,037
52	4	*	7	504,265
53	4	*	2	*
54	2	*	2	*
55	2	*	-	-
56	-	-	-	-
57	-	-	-	-
58	-	-	-	-
59	-	-	-	-
60	-	-	1	*
Over 60	1	*	1	*
Total	99,343	\$ 6,094,002,121	221,969	\$11,249,084,820

* To protect the privacy of beneficiary information, total reported compensation is not shown for groups with fewer than 5 individuals.

Appendix B: Detailed Tabulation of Disabled Member Data

Table B–1: Number and Annual Amount of Disability Benefits Reported for Each Disability Group

Disability Group	As of December 31, 2021		As of December 31, 2020	
	Number	Annual Reported Benefits	Number	Annual Reported Benefits
Disabled Prior to January 1, 1988	47	\$ 95,904	52	\$ 102,787
Disabled after December 31, 1987	<u>4,710</u>	<u>\$ 52,341,573</u>	<u>5,276</u>	<u>\$ 59,727,418</u>
Total	4,757	\$ 52,437,477	5,328	\$ 59,830,205

Appendix B: Detailed Tabulation of Disabled Member Data (continued)

Table B-2: Number and Annual Long-Term Disability Benefits of Members Disabled Prior to January 1, 1988 by Age and Gender as of December 31, 2021

Age	Male		Female	
	Number	Allowances	Number	Allowances
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0
61	0	0	1	*
62	0	0	0	0
63	0	0	0	0
64	0	0	0	0
65	0	0	2	*
66	0	0	5	10,588
67	1	*	2	*
68	0	0	2	*
69	2	*	3	*
70	0	0	0	0
71	1	*	1	*
72	0	0	1	*
73	0	0	2	*
74	0	0	4	*
75	1	*	2	*
76	0	0	0	0
77	0	0	1	*
78	2	*	0	0
79	0	0	1	*
80	0	0	2	*
81	1	*	1	*
82	0	0	0	0
83	0	0	1	*
84	1	*	1	*
85	0	0	0	0
86	0	0	1	*
87	0	0	0	0
88	0	0	0	0
89	0	0	0	0
90	0	0	0	0
91	0	0	1	*
92	0	0	2	*
93	0	0	0	0
94	0	0	0	0
95	0	0	0	0
Over 95	0	0	2	*
Total	9	13,307	38	82,597

* To protect the privacy of beneficiary information, total allowances are not shown for groups with fewer than 5 individuals

Appendix B: Detailed Tabulation of Disabled Member Data (continued)

Table B-3: Number and Annual Disability Benefits of Members Disabled After December 31, 1987 by Age and Gender as of December 31, 2021

Age	Male		Female	
	Number	Allowances	Number	Allowances
Under 26	0	0	1	*
26	0	0	0	0
27	0	0	0	0
28	0	0	1	*
29	1	*	0	0
30	0	0	1	*
31	1	*	0	0
32	0	0	0	0
33	0	0	3	*
34	0	0	7	95,369
35	1	*	5	73,952
36	2	*	5	66,939
37	5	82,724	8	98,495
38	3	*	10	105,780
39	5	71,627	17	238,963
40	4	*	17	241,192
41	5	15,978	17	245,630
42	9	197,071	27	393,250
43	8	58,061	41	559,649
44	23	388,450	41	685,948
45	19	269,199	56	810,676
46	26	348,848	54	809,994
47	36	497,184	61	857,551
48	34	327,023	72	1,126,542
49	33	508,230	96	1,185,100
50	44	568,083	110	1,599,501
51	46	669,795	122	1,680,914
52	43	442,556	128	1,785,305
53	47	613,816	164	2,523,998
54	74	812,340	160	2,128,824
55	67	755,946	186	2,189,437
56	75	865,854	211	2,326,726
57	89	832,121	231	2,645,476
58	75	556,825	222	1,898,438
59	112	1,005,193	231	2,602,087
60	84	711,614	222	1,795,951
61	77	620,168	216	1,949,671

* To protect the privacy of beneficiary information, total allowances are not shown for groups with fewer than 5 individuals

Appendix B: Detailed Tabulation of Disabled Member Data (continued)

Table B-3: Number and Annual Disability Benefits of Members Disabled After December 31, 1987 by Age and Gender as of December 31, 2021 (continued)

Age	Male		Female	
	Number	Allowances	Number	Allowances
62	99	831,467	179	1,581,705
63	105	976,907	197	1,800,555
64	95	735,028	203	1,853,672
65	1	*	2	*
66	3	*	2	*
67	0	0	1	*
68	3	*	1	*
69	0	0	1	*
70	1	*	2	*
71	2	*	1	*
72	1	*	3	*
73	0	0	2	*
74	0	0	3	*
75	0	0	0	0
76	1	*	1	*
77	0	0	1	*
78	0	0	1	*
79	0	0	1	*
80	0	0	0	0
81	0	0	0	0
82	0	0	1	*
83	2	*	0	0
84	0	0	2	*
85	0	0	0	0
86	0	0	0	0
87	0	0	1	*
88	0	0	0	0
89	0	0	0	0
90	0	0	0	0
91	0	0	0	0
92	0	0	0	0
93	0	0	0	0
94	0	0	1	*
95	0	0	0	0
Over 95	0	0	0	0
Total	1,361	14,007,340	3,349	38,334,233

* To protect the privacy of beneficiary information, total allowances are not shown for groups with fewer than 5 individuals.

Appendix C: Development of the Actuarial Value of Assets

The Actuarial Value of Assets is determined using a method that attempts to “flatten” the peaks and valleys inherent in market values of assets. Under the “five-year smoothed value” asset valuation method selected by the System, investment gains and losses are recognized in equal portions over a five-year period. The calculation of the Actuarial Value of Assets is based on a formula that is mathematically equivalent to the process described above:

$$MV - [80\% \times G/(L)_1] - [60\% \times G/(L)_2] - [40\% \times G/(L)_3] - [20\% \times G/(L)_4]$$

where,

MV is the market value of assets as of the valuation date; and,

G/(L)_i is the asset gain or (loss) for the i-th year preceding the valuation date.

However, the resulting Actuarial Value of Assets cannot be less than 80% or more than 120% of the market value of assets as of the measurement date. The development of the Actuarial Value of Assets as of December 31, 2021 is shown in the table below:

Development of the Actuarial Value of Assets for the Year Ending	December 31, 2021
Market Value of Assets, Beginning of Year	\$ 352,063,991
Employer Contributions	\$ 16,344,741
Employer Contributions Receivable	0
Benefit Payments and Administrative Expenses	(43,882,157)
Net Cash Flow	\$ (27,537,416)
Expected Investment Return	\$ 10,151,911
Expected Market Value of Assets, End of Year	\$ 334,678,486
Market Value of Assets, End of Year	\$ 318,872,382
Excess Market Value over Expected Market Value of Assets	\$ (15,806,104)
80% of 2020 Asset Gain/(Loss)	\$ (12,644,882)
60% of 2019 Asset Gain/(Loss)	6,836,922
40% of 2018 Asset Gain/(Loss)	6,125,553
20% of 2017 Asset Gain/(Loss)	(3,102,743)
Total Deferred Asset Gain/(Loss)	\$ (2,785,150)
Preliminary Actuarial Value of Assets, End of Year (not less than 80% and not greater than 120% of Market Value)	\$ 321,657,532
Final End of Year Actuarial Value of Assets	\$ 321,657,532
Estimated Net Investment Return on Actuarial Value	2.64%

Appendix D: Actuarial Assumptions and Methods

Assumptions are based on the experience investigation prepared as of December 31, 2019 and adopted by the Board of Trustees on January 28, 2021 for use beginning with the December 31, 2020 annual actuarial valuation.

Economic Assumptions

Discount Rate

3.00% per year, compounded annually.

Expected Rate of Return on Assets

3.00% per year, net of investment expenses.

Expected Long-term Rates of Inflation

Both general and wage inflation are assumed to be 2.50% per year.

Expected Long-term Real Wage Growth

0.75% per year.

Expected Across-the-Board Salary Increases

For disability events that first occur on or after January 1, 1988, extended STD and LTD benefits (before reductions) are assumed to increase 3.25% per year. Otherwise, no increases have been assumed.

Expected Long-term National Average Wage Growth

3.25% per year for the purposes of calculating Social Security benefits.

Expected Future Increases in Social Security Benefits

For disability events that first occur on or after January 1, 1988, Social Security disability benefits are assumed to increase by 2.50% per year. Otherwise, no increases have been assumed.

Expected Administrative Expenses Included in Normal Cost

Estimated administrative expenses equal to 0.01% of payroll were included in the normal cost rate.

Appendix D: Actuarial Assumptions and Methods (continued)

Demographic Assumptions

Separations From Active Service

Representative values of the assumed rates of separation from active service are as follows:

Rates of Withdrawal

Up to five years of membership								
Service	General Employees		Teachers, Librarians, and Counselors		Law Enforcement Officers		Other Education	
	Male	Female	Male	Female	Male	Female	Male	Female
0	0.0900	0.0900	0.0500	0.0350	0.0350	0.0350	0.0900	0.0700
1	0.1700	0.1750	0.1750	0.1650	0.0925	0.0925	0.1900	0.1750
2	0.1500	0.1575	0.1550	0.1550	0.0925	0.0925	0.1700	0.1550
3	0.1250	0.1400	0.1450	0.1375	0.0950	0.0950	0.1300	0.1250
4	0.1100	0.1150	0.1150	0.1150	0.0800	0.0800	0.1100	0.1075

After five years of Membership								
Service	General Employees		Teachers, Librarians, and Counselors		Law Enforcement Officers		Other Education	
	Male	Female	Male	Female	Male	Female	Male	Female
25	0.2500	0.2500	0.3000	0.3500	0.0750	0.0750	0.2500	0.2500
30	0.1250	0.1200	0.0900	0.1000	0.0750	0.0750	0.1000	0.1500
35	0.0750	0.1000	0.0600	0.0575	0.0350	0.0350	0.0550	0.0750
40	0.0500	0.0575	0.0475	0.0400	0.0250	0.0250	0.0500	0.0650
45	0.0400	0.0400	0.0375	0.0350	0.0200	0.0200	0.0500	0.0475
50	0.0400	0.0400	0.0425	0.0400	0.0200	0.0200	0.0500	0.0450
55	0.0400	0.0400	0.0425	0.0400			0.0400	0.0350
60	0.0400	0.0400	0.0425	0.0400			0.0400	0.0350

Appendix D: Actuarial Assumptions and Methods (continued)

Pre-Retirement Mortality

Representative values of the assumed pre-retirement mortality rates as of 2010 (the most recent developed Public Pension mortality tables) prior to any mortality improvements are as follows:

Annual Rates of Mortality for Employees (Base rates using Pub-2010 Amount Weighted)								
Service	General Employees		Teachers, Librarians, and Counselors		Law Enforcement Officers		Other Education	
	Male	Female	Male	Female	Male	Female	Male	Female
25	0.00028	0.00009	0.00016	0.00009	0.00037	0.00020	0.00028	0.00009
30	0.00036	0.00015	0.00022	0.00014	0.00041	0.00027	0.00036	0.00015
35	0.00047	0.00023	0.00030	0.00020	0.00047	0.00036	0.00047	0.00023
40	0.00066	0.00036	0.00042	0.00031	0.00059	0.00049	0.00066	0.00036
45	0.00098	0.00056	0.00067	0.00048	0.00082	0.00067	0.00098	0.00056
50	0.00149	0.00083	0.00111	0.00073	0.00120	0.00091	0.00149	0.00083
55	0.00219	0.00123	0.00172	0.00107	0.00175	0.00123	0.00219	0.00123
60	0.00319	0.00186	0.00264	0.00161	0.00264	0.00168	0.00319	0.00186
65	0.00468	0.00296	0.00435	0.00270	0.00410	0.00228	0.00468	0.00296
70	0.00703	0.00489	0.00709	0.00485	0.00766	0.00454	0.00703	0.00489
74	0.01001	0.00731	0.00993	0.00809	0.01263	0.00787	0.01001	0.00731

Retirements

Representative values of the assumed rates of retirement from active service are as follows:

Annual Rates of Retirement

General Employees - Males							
Age	Service						
	5	10	15	20	25	30	35
50				0.030	0.040	0.600	0.600
55				0.030	0.040	0.400	0.350
60	0.090	0.070	0.070	0.100	0.225	0.400	0.270
65	0.180	0.250	0.250	0.300	0.400	0.275	0.300
70	0.180	0.250	0.225	0.225	0.250	0.300	0.300
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

General Employees - Females							
Age	Service						
	5	10	15	20	25	30	35
50				0.035	0.040	0.400	0.400
55				0.040	0.040	0.400	0.250
60	0.070	0.080	0.090	0.095	0.200	0.400	0.250
65	0.200	0.250	0.300	0.300	0.350	0.350	0.300
70	0.150	0.200	0.225	0.250	0.350	0.300	0.300
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Appendix D: Actuarial Assumptions and Methods (continued)

Annual Rates of Retirement (continued)

Teachers, Librarians, and Counselors - Males							
Age	Service						
	5	10	15	20	25	30	35
50				0.030	0.030	0.700	0.700
55				0.045	0.030	0.400	0.450
60	0.085	0.080	0.100	0.100	0.300	0.400	0.300
65	0.175	0.225	0.250	0.325	0.400	0.300	0.250
70	0.175	0.225	0.250	0.250	0.250	0.150	0.300
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Teachers, Librarians, and Counselors - Females							
Age	Service						
	5	10	15	20	25	30	35
50				0.050	0.045	0.650	0.750
55				0.050	0.045	0.400	0.375
60	0.080	0.100	0.100	0.130	0.250	0.500	0.375
65	0.250	0.300	0.250	0.350	0.475	0.450	0.400
70	0.225	0.250	0.300	0.300	0.300	0.400	0.325
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Law Enforcement Officers							
Age	Service						
	5	10	15	20	25	30	35
50			0.040	0.050	0.050	0.900	0.800
55	0.200	0.200	0.350	0.350	0.500	0.950	0.650
60	0.100	0.200	0.125	0.250	0.250	0.500	0.500
65	0.150	0.450	0.250	0.250	0.250	0.500	0.500
70	0.250	0.150	0.250	0.250	0.250	0.250	0.500
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Other Education Employees - Males							
Age	Service						
	5	10	15	20	25	30	35
50				0.035	0.045	0.500	0.500
55				0.040	0.050	0.300	0.300
60	0.080	0.070	0.100	0.090	0.200	0.300	0.275
65	0.100	0.250	0.250	0.300	0.275	0.250	0.275
70	0.100	0.250	0.250	0.225	0.300	0.250	0.350
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Appendix D: Actuarial Assumptions and Methods (continued)

Annual Rates of Retirement (continued)

Other Education Employees - Females							
Age	Service						
	5	10	15	20	25	30	35
50				0.045	0.045	0.400	0.500
55				0.045	0.060	0.300	0.300
60	0.070	0.090	0.100	0.100	0.300	0.375	0.300
65	0.175	0.250	0.250	0.300	0.350	0.300	0.350
70	0.150	0.200	0.225	0.200	0.275	0.200	0.350
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Salary Merit Increases

Total assumed salary increases are these merit rates combined with the wage inflation assumption of 3.25% (2.50% price inflation plus 0.75% real wage growth). Representative values of the assumed annual rates of salary merit increases are as follows:

Service	General Employees	Teachers, Librarians and Counselors	Law Enforcement Officers	Other Education
0	3.00%	4.05%	4.80%	4.25%
5	1.80%	2.87%	3.10%	2.65%
10	1.10%	2.04%	2.00%	1.85%
15	0.60%	1.13%	0.80%	1.33%
20	0.50%	0.00%	0.80%	0.83%
25	0.40%	0.00%	0.80%	0.33%
30	0.00%	0.00%	0.40%	0.00%
>=35	0.00%	0.00%	0.00%	0.00%

Post-Retirement Mortality

Representative values of the assumed post-retirement mortality rates as of 2010 (the most recent developed Public Pension mortality tables) prior to any mortality improvements are as follows:

Annual Rates of Post-Retirement Mortality (Healthy Members at Retirement)								
Service	General Employees		Teachers, Librarians, and Counselors		Law Enforcement Officers		Other Education	
	Male	Female	Male	Female	Male	Female	Male	Female
55	0.00455	0.00272	0.00335	0.00266	0.00327	0.00279	0.00455	0.00272
60	0.00649	0.00365	0.00471	0.00344	0.00549	0.00482	0.00649	0.00365
65	0.00963	0.00582	0.00672	0.00456	0.00957	0.00832	0.00963	0.00582
70	0.01610	0.01010	0.01183	0.00789	0.01711	0.01438	0.01610	0.01010
75	0.02818	0.01789	0.02187	0.01499	0.03085	0.02483	0.02818	0.01789
80	0.05037	0.03360	0.04030	0.02895	0.05571	0.04287	0.05037	0.03360

Appendix D: Actuarial Assumptions and Methods (continued)

Annual Rates of Post-Retirement Mortality						
Age	Contingent Survivors of Deceased Members		Members Disabled at Retirement			
	All Survivors		Non-Law Enforcement Officers		Law Enforcement Officers	
	Male	Female	Male	Female	Male	Female
55	0.01147	0.00742	0.02355	0.01692	0.01818	0.01587
60	0.01450	0.00975	0.02785	0.01914	0.02280	0.01833
65	0.02086	0.01332	0.03524	0.02178	0.02677	0.02051
70	0.03221	0.01931	0.04599	0.02706	0.03353	0.02450
75	0.04971	0.02946	0.06347	0.03718	0.04344	0.03239
80	0.07802	0.04698	0.09259	0.05517	0.05921	0.04678

Mortality Assumption

All mortality rates use Pub-2010 amount-weighted tables.

Mortality Projection

All mortality rates are projected from 2010 using generational improvement with Scale MP- 2019.

Deaths After Retirement (General Employees and Other Education)

Mortality rates are based on the General Mortality Table for Retirees. Rates for male members are multiplied by 105.5% at all ages. Rates for female members are multiplied by 95% for ages under 76, increased by 1% for each age up to age 90 and by 110% for all ages greater than 89. Because the retiree tables have no rates prior to age 50, the General Mortality Table for Employees is used for ages less than 50.

Deaths After Retirement (Teachers)

Mortality rates are based on the Below-median Teachers Mortality Table for Retirees. Rates for male members are multiplied by 96% for ages under 83, increased by 2% for each age up to 87 and by 106% for all ages greater than 86. Rates for female members are multiplied by 101% for age 81, increased by 1% for each age up to 85, and by 105% for all ages greater than 84. Because the retiree tables have no rates prior to age 55, the Below-median Teachers Mortality Table for Employees is used for ages less than 55.

Deaths After Retirement (Law Enforcement Officers)

Mortality rates are based on the Safety Mortality Table for Retirees. Rates for all members are multiplied by 97% and Set Forward by 1 year. Because the retiree tables have no rates prior to age 45, the Safety Mortality Table for Employees is used for ages less than 45.

Deaths After Retirement (Survivors of Deceased Members)

Mortality rates are based on the Below-median Teachers Mortality Table for Contingent Survivors. Rates for male members are Set Forward 3 years. Rate for female members are Set Forward 1 year. Because the contingent survivor tables have no rates prior to age 45, the Below-median Teachers Mortality Table for Employees is used for ages less than 45.

Appendix D: Actuarial Assumptions and Methods (continued)

Deaths After Retirement (Disabled Members at Retirement)

Mortality rates are based on the General Mortality Table for Disabled Retirees. Rates for male members not in Law Enforcement are Set Forward 3 years, while male members in Law Enforcement are Set Back 3 years. Rates for female members not in Law Enforcement are Set Back 1 year, while female members in Law Enforcement are Set Back 3 years.

Deaths Prior to Retirement

Mortality rates are based on the General Mortality Table for Employees for all employees except law enforcement officers. Mortality rates for law enforcement officers are based on the Safety Mortality Table for Employees.

Disability Rates

The table below provides age and gender based annual rates of disability per 1,000 lives exposed at sample ages:

Age	Male	Age	Female
20–24	0.74	20–24	0.65
25–29	0.74	25–29	0.65
30–34	1.06	30–34	2.52
35–39	1.91	35–39	2.54
40–44	2.43	40–44	3.8
45–49	3.19	45–49	4.97
50–55	5.31	50–53	8.38
56–61	7.37	54–62	7.63
62–64	5.96	63–64	5.05

These rates differ from the disability rates shown in the prior year report. It has been confirmed with the prior actuary that the rates shown above are the rates used in the prior valuation, and are comparable to the rates in the 12/31/2019 report after reflecting the experience study adopted for the 12/31/2020 valuation.

Decrement Timing and Adjustment

All withdrawals, deaths, disabilities, retirements, and salary increases are assumed to occur July 1 of each year. The timing of retirement changes from mid-year to beginning of year at and after the 100% retirement age.

Appendix D: Actuarial Assumptions and Methods (continued)

Disability Claim Termination Rates

Monthly select disability claim termination rates were used for the first 24 months of disability. The following tables contain age-at-disability and gender-based rates of disability claim termination per 1,000 lives for sample durations of disability:

Males

Disability Duration (in months)	Age at Disability								
	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64
5	187.7	166.3	150.7	135.4	121.8	108.3	94.4	83.9	75.6
10	51.5	44.4	38.3	33.3	29.5	26.6	23.1	21.2	19.8
15	32.7	27.9	23.7	20.2	17.8	16.1	13.8	12.6	12.0
20	23.0	20.1	17.1	14.7	12.8	11.6	9.6	9.0	8.6
24	20.6	18.1	15.4	13.3	11.4	10.2	8.3	7.7	7.3

Females

Disability Duration (in months)	Age at Disability								
	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64
5	177.5	157.7	139.5	126.0	115.0	106.0	96.0	88.7	81.3
10	46.5	40.8	36.5	33.2	31.0	29.1	26.3	24.6	22.6
15	29.7	25.8	22.6	20.2	18.4	17.1	15.2	14.1	13.0
20	21.8	18.7	16.3	14.3	12.8	11.8	10.2	9.5	8.9
24	19.8	16.8	14.6	12.7	11.2	10.3	8.6	8.1	7.5

Annual select and ultimate disability claim termination rates were used after the first 24 months of disability, with select rates effective from 5 to 25 years. The following tables contain age-at-disability and gender-based rates of disability claim termination per 1,000 lives for sample durations of disability:

Males

Disability Duration (in years)	Age at Disability								
	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64
5	94.7	83.8	72.9	63.5	56.3	51.2	42.3	43.8	43.2
10	42.0	40.3	36.3	32.2	30.0	31.2	34.3	38.0	40.9
15	29.2	28.3	28.4	27.3	28.3	32.2	35.9	40.8	47.2
20	25.2	26.3	29.3	31.4	36.1	42.2	47.8	58.5	68.4
25	28.3	28.5	33.6	36.2	38.1	53.1	59.6	88.8	129.4

Appendix D: Actuarial Assumptions and Methods (continued)

Females

Disability Duration (in Years)	Age at Disability								
	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64
5	90.9	76.3	64.7	55.4	48.5	44.4	37.2	38.5	37.1
10	40.0	35.6	29.3	25.4	23.0	23.0	24.5	27.9	29.5
15	28.5	26.5	22.4	20.6	20.5	22.2	25.1	26.2	37.5
20	26.8	23.8	21.8	21.5	24.2	27.7	31.9	39.8	55.7
25	27.6	25.5	25.1	24.2	27.1	41.7	41.5	76.6	130.2

Dates of Disability

The date of disability is the calendar month, day, and year on which a claimant meets the definition of disability under Plan. This date is used to estimate the member's age-at-disability and the duration of the member's disability, which are used in the determination of the applicable monthly select, and annual select and ultimate, disability claim termination rates described above.

The Retirement Systems Division (RSD) did not provide date of disability or age-at-disability for members who are receiving extended short-term and long-term disability benefits under the Plan as of December 31, 2021. As instructed by RSD, we assumed that dates of disability for these members occurred twelve months before their benefit start dates. We note that benefit start dates could be deferred as a result of member decisions, any delay in the disability application and/or certification process(es), or any change in the applicable disability program (for example, if a new benefit start date would be generated for members who begin receiving long-term disability benefits after having exhausted extended short-term disability benefits). Nevertheless, we believe that the prescribed method is a reasonable approach because, generally speaking, members must have been enrolled for twelve months under the short-term disability program before extended short-term or long-term disability benefits can be paid, and the number of members whose estimated dates of disability reflect more recent event dates than actual experience would support is likely not significant.

Assumed Social Security Disability Benefit Approval Rates

Future Disabled Members

50% of members who had less than five years of service as of July 31, 2007 are assumed to receive approval for Social Security disability benefits from the conclusion of the waiting period and prior to the completion of four years of disability. All other members are assumed to receive approval for Social Security disability benefits.

Current Disabled Members

Actual Social Security disability benefit approval information is used where available. If actual Social Security disability decisions are not available, 50% of currently disabled members who had less than five years of service as of July 31, 2007 are assumed to receive approval for Social Security disability benefits. Otherwise, all other currently disabled members are assumed to receive approval for Social Security disability benefits.

Future State Health Plan Enrollment

Not applicable on a prospective basis. DIPNC does not pay any health care related benefits except to reimburse employers for health care costs during the second six months of the short-term disability period for members whose benefits were effective before July 1, 2019.

Appendix D: Actuarial Assumptions and Methods (continued)

Other Assumptions and Methods

Gross Benefit Adjustments

Our understanding is that the gross benefit amounts provided by the Retirement Systems Division (RSD) as of December 31, 2021 reflect the multipliers and/or limits applicable to the disability program in which the claimant is enrolled, as reported on the census data. For the purposes of estimating incurred but not reported (IBNR) liabilities, gross benefit amounts payable to members who are currently receiving extended short-term disability benefits were adjusted to reflect the multipliers used under the long-term disability program. However, if “unlimited” gross benefits were not provided on the census data, we assumed that claimants would have the highest allowable gross benefit under the Plan’s long-term disability provisions if the highest allowable extended short-term gross benefit was provided on the census data.

Social Security Benefit Offsets

Future Disabled Members

Estimated projected Social Security benefits for future disabled members are based on expected long-term National Average Wage growth assumptions, assumptions about future increases in Social Security benefits, valuation salaries from age at entry to future decrement dates, and the Social Security benefit determination rules applicable to the law year in effect on future decrement dates.

Estimated projected Social Security retirement benefits were adjusted to reflect reductions / increases for early / late commencement.

Current Disabled Members

Social Security benefit offsets were not provided for some claimants—for example, members who are currently receiving extended short-term disability benefits—as of December 31, 2021. We estimated Social Security benefits for affected claimants based on the relevant assumptions listed above, wages at termination projected backward reflecting relative changes in National Average Wages to member aged 20, and the Social Security benefit determination rules applicable to the 2021 law year.

Other Offsets

No additional offsets—including but not limited to Worker’s Compensation, VA benefits, and Outside Earnings—other than those reported, have been assumed.

Reported Compensation

Calendar year compensation provided by the System’s office.

Valuation Compensation

Reported compensation adjusted to reflect the assumed rate of pay as of the valuation date and the probability of decrement during the year.

Compensation Limits

No compensation limits are applied.

Marriage Assumption

100% married with male spouses three years older than female spouses.

Appendix D: Actuarial Assumptions and Methods (continued)

Missing Gender Code

For members reported on the data without a gender code, we use the prior year's code where available or assign a code based on inspection.

Valuation Date

December 31, 2021

Benefits Not Valued

None.

Actuarial Cost Method

The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future (currently 3.00%), of each member's expected benefits at future disability events is determined, based upon age, service, and gender. The calculations take into account the probability of a member's disability, recovery from disability, death, retirement, or termination of employment prior to receiving benefits under the Plan. The present value of the expected benefits payable on account of active members is added to the present value of the expected future payments to currently disabled members to obtain the present value of all expected benefits payable by the Plan.

The actuarial cost method is a procedure for allocating the actuarial present value of postemployment benefits and expenses to time periods. The method used for funding purposes is known as the Aggregate actuarial cost method, and has the following characteristics:

- (i) The annual normal cost is determined for the entire group active participants rather than individually for each participant.
- (ii) This cost method does not identify or separately amortize unfunded actuarial liabilities. Thus, actuarial gains (losses), as they occur, reduce (increase) future normal costs.

The Aggregate actuarial cost method allocates the actuarial present value of postemployment benefits for all active participants and currently disabled members in excess of the Actuarial Value of Assets on a level basis over the present value of projected compensation for all active participants between the valuation date and the date that the last employee retires (collectively).

The portion of the actuarial present value allocated to the valuation year is called the normal cost. Under the Aggregate actuarial cost method, the annual normal cost is a percentage of the year-by-year projected total covered compensation for all employees. This actuarial cost method does not produce an Actuarial Accrued Liability, so the Actuarial Accrued Liability based on the Entry Age Normal (Level Percentage of Pay) actuarial cost method is often reported in connection with results based on the Aggregate actuarial cost method.

The actuarial cost method was prescribed by the System for the purposes of preparing the actuarially determined employer contribution rate for the Plan as of December 31, 2021.

Appendix D: Actuarial Assumptions and Methods (continued)

Asset Valuation Method

The Actuarial Value of Assets for this purpose is determined using the “five-year smoothed value” asset valuation method, which attempts to “flatten” the peaks and valleys inherent in market values of assets. Under this method, investment gains and losses are recognized in equal portions over a five-year period. Investment gains and losses are determined by comparing the actual return on market value for a given period to the anticipated earnings over the same period if the market value of assets at the beginning of the period, contributions, benefit payments, and administrative expenses during the period earned the expected rate of return for the portion of the period that each was expected to be including in, or excluded from, plan assets. The expected rate of return for this purpose is equal to the expected long-term rate of return assumption selected at the beginning of the experience period (in this case, 3.00% as of January 1, 2021). The resulting Actuarial Value of Assets cannot be less than 80% or more than 120% of the market value of assets. Please see Appendix C for the development of the Actuarial Value of Assets as of the valuation date.

The asset valuation method was prescribed by the System for the purposes of preparing the actuarially determined employer contribution rate for the Plan as of December 31, 2021.

Incurred But Not Reported Claims (IBNR)

IBNR claims are based on the one-year term cost for expected disablements during the year. For long-term disability, a reserve of 14/12 of the term cost is added to account for the waiting time after disability to receive LTD benefits.

Funding Policy

The actuarial cost method, asset valuation method, and other components of the contribution allocation procedure were considered and approved by the Board during the most recent experience study. ADC rates as of the valuation date were developed based on the Plan’s Normal Cost as a percent of pay plus an allowance for administrative expenses, as approved by the System.

Other Assumptions and Methods

Unless otherwise stated above, all other actuarial assumptions and methods are the same as those used for the purpose of determining periodic funding contributions as of December 31, 2020.

Please see the December 31, 2020 actuarial valuation report for additional information about the data, assumptions, methods, and plan provisions used to prepare results as of the December 31, 2020 measurement date. Likewise, additional information concerning historical results can be found in the relevant actuarial valuation report for each valuation date. Please keep in mind that any information that may be included in this report for periods prior to December 31, 2021 was produced by other actuarial consulting firms.

Changes in Funding Assumptions and Methods Since the Prior Valuation

The assumptions used for the December 31, 2021 actuarial valuation are based on the experience study prepared as of December 31, 2019 and adopted by the Board of Trustees on January 28, 2021. There were no material assumptions or methods that were changed since the prior valuation.

Appendix E: Summary of Main Benefit Provisions

This summary of main benefit provisions is intended to describe only the principal features of the Disability Income Plan of North Carolina (DIPNC, or the Plan), a cost-sharing, multiple employer defined benefit OPEB plan sponsored by the Teachers' and State Employees' Retirement System of North Carolina (the System) as interpreted for valuation purposes. All actual eligibility requirements and benefit amounts will be determined in accordance with the Plan document and any System practices, processes, and procedures.

Overview of the Plan

The Disability Income Plan of North Carolina became effective January 1, 1988. The Plan replaced the Disability Salary Continuation Plan for Teachers and State Employees of North Carolina (DSC Plan). Those beneficiaries disabled prior to January 1, 1988 continue to be covered under the provisions of the DSC Plan as in effect December 31, 1987. Beneficiaries disabled on or after January 1, 1988 are covered under the provisions of the Disability Income Plan.

Membership in the Plan

All teachers and other employees who are in active service and are members of the Teachers' and State Employees' Retirement System (TSERS) or the UNC Optional Retirement Program (ORP) on or after January 1, 1988 are eligible to participate in the Plan.

Definition of Disability

The mental or physical incapacity for the further performance of duty of a beneficiary; provided that such incapacity was not the result of terrorist activity, of active participation in a riot, of the commission or attempt to commit a felony, or of the intentional self-infliction of an injury.

Definition of Base Rate of Compensation

The regular monthly rate of compensation not including pay for shift premiums, overtime, or other types of extraordinary pay as determined by the Board of Trustees.

Definition of Annual Longevity Payment

Full-time and part-time (20 hours or more) permanent, probationary, and time-limited employees are eligible for annual longevity payments, whereas, part-time (less than 20 hours) and temporary employees are not eligible for these payments.

Annual longevity pay amounts are based on the length of total State service and a percentage of the eligible employee's annual base rate of compensation on the date of eligibility. Longevity pay amounts are determined by multiplying the eligible employee's annual base rate of compensation by the appropriate percentage from the following table:

Years of Total State Service	Longevity Pay Percentage
Under 10 years	0.00%
10 but less than 15 years	1.50%
15 but less than 20 years	2.25%
20 but less than 25 years	3.25%
25 or more years	4.50%

Appendix E: Summary of Main Benefit Provisions (continued)

Short-Term Disability Benefits

Eligibility for Short-Term Disability Benefits

Prior to June 25, 2018, any participant who becomes disabled and is no longer able to perform his usual occupation after at least 365 calendar days succeeding his date of initial employment and at least one year of contributing membership service in the System may be eligible for STD benefits.

Effective June 25, 2018, any participant who becomes disabled and is no longer able to perform his or her usual occupation may be eligible for STD benefits provided all of the following conditions are met:

- (1) Application for the benefit occurs at least 365 calendar days succeeding the participant's date of initial employment as a teacher or employee;
- (2) The participant has at least one year of contributing membership service earned within 36 calendar months immediately preceding the date of disability. Salary continuation (see below) used during the period shall count toward this one-year requirement;
- (3) The member applies for short-term disability within one year of the end of the waiting period;
- (4) The participant's employer and attending physician certify that the participant is mentally or physically incapacitated for the further performance of duty; and,
- (5) The participant's incapacity was incurred at the time of active employment and has been continuous thereafter.

Waiting Period

A beneficiary shall receive no benefits from the Plan for a period of 60 continuous calendar days from the onset of disability determined as the last actual day of service, the day that the physician certified the disability, or the day succeeding at least 365 calendar days after the commencement of service as a teacher or employee, whichever is later.

Salary Continuation Benefits

During the waiting period, a beneficiary may be paid such salary continuation as provided by an employer through the use of sick leave, vacation leave or any other salary continuation.

A disabled beneficiary may elect to receive any such salary continuation in lieu of STD benefits provided such election shall not extend the 365 days duration of the STD period.

Commencement of STD Benefits

The STD benefit commences on the first day succeeding the waiting period.

Monthly STD Benefit Amounts

50% of 1/12th of the annual base rate of compensation last payable to the beneficiary prior to the beginning of the STD period plus 50% of 1/12th of the annual longevity payment to which the beneficiary would be eligible, to a maximum of \$3,000 per month, reduced by any other benefits that are payable to the beneficiary including but not limited to:

- (1) Monthly temporary total Workers' Compensation payments by any employer*;
- (2) Monthly Veterans Administration (VA) disability payments for the same (or for a related) disability;
- (3) Monthly benefits payable under other Federal or certain statutory disability plans;

* However, STD benefits are not offset by permanent, partial Workers' Compensation benefits.

Appendix E: Summary of Main Benefit Provisions (continued)

- (4) Monthly wages or other income paid by public or private employers in excess of the participant's earnable allowance. If a beneficiary has earnings in excess of the STD benefit, the STD benefit shall be also reduced on a dollar-for-dollar basis by the amount that exceeds the STD benefit; and,
- (5) Monthly severance pay as a result of a reduction-in-force from the State.

Post Disability Benefit Adjustments

The compensation upon which the STD benefit is calculated may be increased by any percentage across-the-board salary increases granted by the General Assembly.

Duration of STD Benefits

STD benefits are payable for up to 365 days following the waiting period. The first six months of benefits are payable by the employer outside of the trust. The remaining six months are also paid by the employer outside of the trust.

Effective July 1, 2019, the Plan will no longer reimburse employers for short-term disability or State Health Plan premiums paid during the "second six month" period for benefits effective on or after that date .

Extended Short-Term Disability Benefits

Eligibility for Extended Short-Term Disability Benefits

Any beneficiary who completes 365 days of short-term disability benefits may be eligible to receive extended STD benefits if the disability is expected to end during the extended period, and the extension is approved by the Medical Board.

Waiting Period

There is no waiting period for extended STD benefits. However, a member must exhaust STD benefits before extended STD benefits can be paid.

Salary Continuation Benefits

Same as for STD benefits.

Commencement of Extended STD Benefits

The extended STD benefit commences on the first day succeeding the conclusion of the short-term disability period.

Monthly Extended STD Benefit Amounts

Same as STD benefit amounts.

Appendix E: Summary of Main Benefit Provisions (continued)

Post Disability Benefit Adjustments

Same as for STD benefits.

Duration of Extended STD Benefits

Extended STD benefits are payable for up to an additional 365 days beyond the initial 365 day short-term period. During this extended period, STD benefits are paid directly from the trust.

Long-Term Disability Benefits

Eligibility for Long-Term Disability Benefits

Any beneficiary who has five or more years of contributing membership service in the System, earned within the 96 calendar months prior to becoming disabled or the cessation of continuous salary continuation payments, whichever is later, may be eligible to receive LTD benefits from the Plan upon approval by the Board of Trustees provided that the disability is likely to be permanent, and the beneficiary or participant withdraws from active service by terminating employment as a teacher or State employee.

Waiting Period

There is no waiting period for LTD benefits. However, a member must exhaust STD benefits before LTD benefits can be paid.

Salary Continuation Benefits

A disabled beneficiary may elect to receive any such salary continuation in lieu of LTD benefits provided such election shall not extend the first 36 consecutive calendar months of the LTD period.

Commencement of LTD Benefits

Benefits commence on the first day succeeding the conclusion of the short-term disability period provided the beneficiary makes application for such benefits within 180 days after the short-term disability period ceases or after salary continuation payments cease, whichever is later.

Monthly LTD Benefit Amounts

65% of 1/12th of the annual base rate of compensation last payable to the beneficiary prior to the beginning of the STD benefit period plus 65% of 1/12th of the annual longevity payment to which the beneficiary would be eligible, to a maximum of \$3,900 per month, reduced by any other benefits that are payable to the beneficiary including but not limited to:

- (1) Monthly primary Social Security disability benefits*;
- (2) Monthly temporary total or partial Workers' Compensation payments by any employer;
- (3) Monthly Veterans Administration (VA) disability payments for the same (or for a related) disability; Monthly benefits payable under other Federal or certain statutory disability plans;
- (4) Monthly benefits payable from TSERS, or other retirement systems supported by the State;
- (5) Monthly benefits payable through other insurance plans to which the State contributes;
- (6) Monthly wages or other income paid by public or private employers in excess of the participant's earnable allowance; and,
- (7) Monthly severance pay as a result of a reduction-in-force from the State.

** For members with less than five years of service as of July 31, 2007, LTD benefits terminate after 36 months if the member has not been approved for Social Security disability benefits. Otherwise, the beneficiary's benefit shall be reduced by an amount—as determined by the Board of Trustees—equal to the primary Social Security disability benefit to which the beneficiary might have been entitled had the beneficiary been awarded Social Security disability benefits.*

However, in any event, the monthly LTD benefit payable after all offsets have been deducted cannot be less than \$10 per month.

Appendix E: Summary of Main Benefit Provisions (continued)

Post Disability Benefit Adjustments

The compensation upon which the long-term disability benefit is calculated may be increased by any percentage across-the-board salary increases granted by the General Assembly. Benefits shall be reduced by future increases granted by the Social Security Administration.

Duration of LTD Benefits

Under N.C. G.S. § 135-112, some participants who were actively employed on January 1, 1988 and started receiving LTD benefits before completing 5 years of contributory membership service will receive lifetime benefits in lieu of service accruals under the System.

For all other participants, the LTD benefit is payable until the earliest date at which the beneficiary is eligible for an unreduced service retirement allowance from TSERS, or the termination of disability, whichever occurs first.

Please see the actuarial valuation report for TSERS presented concurrently with this report for a complete description of the eligibility requirements related to TSERS unreduced service retirement allowances for various employee groups.

DSC Plan Long-Term Disability Benefits

Eligibility for DSC Plan Long-Term Disability Benefits

Only participants who were first disabled prior to January 1, 1988 and are currently receiving LTD payments are eligible for LTD benefits under the predecessor Disability Salary Continuation Plan (DSC Plan).

Monthly DSC Plan LTD Benefit Amounts

60% of monthly salary to a maximum of \$1,000 per month reduced by benefits payable from other plans including but not limited to:

- (1) Social Security benefits payable:
Before July 1, 1974—full family benefits.
On or after July 1, 1974—primary benefits only;
- (2) Workers' Compensation, and other Federal and certain statutory disability benefits;
- (3) Benefits payable from TSERS, or other retirement systems supported by the State;
- (4) Benefits payable through other insurance plans to which the State contributes; and,
- (5) Wages or other income paid by public or private employers in excess of the participant's earnable allowance.

Appendix E: Summary of Main Benefit Provisions (continued)

Post Disability Benefit Adjustments

DSC Plan LTD benefits shall not be increased by future across-the-board salary increases granted by the General Assembly nor decreased by any future increases granted by the Social Security Administration.

Duration of DSC Plan LTD Benefits

The LTD benefit under the DSC Plan is payable until the termination of disability.

Termination of Disability Benefits

Disability benefits will end—and all future disability benefits will be forfeited—if a beneficiary receives a refund of his or her contributions or, in the case of STD benefits, starts receiving a retirement benefit from the System. Disability benefits can also be terminated by member request.

Plan benefits may be terminated by the System for reasons including but not limited to:

- (1) The beneficiary returns to a contributing membership position with TSERS or ORP;
- (2) Beneficiary earnings consistently exceed his or her earnable allowance;
- (3) A medical professional does not continue to certify the beneficiary's disability when a reexamination is requested by the Medical Board;
- (4) The Medical Board certifies that the beneficiary is no longer disabled;
- (5) The beneficiary did not have 5 years of service as of July 31, 2007 and was denied or did not receive approval for Social Security disability benefits after receiving 36 months of LTD payments;
- (6) The beneficiary becomes eligible (or would have become eligible) for a TSERS unreduced service retirement benefit while he or she is receiving LTD benefits; or
- (7) The beneficiary dies.

Contributions

The Plan is funded solely through contributions made by the State and/or employing units. Participants do not contribute.

Changes in Benefit Provisions Since the Prior Valuation

Buck reviewed legislative changes with RSD and no material changes since the prior valuation were identified.

Appendix F: GASB 74 Fiduciary Net Position Projection

Table F-1: Projection of Fiduciary Net Positions (in thousands)

Calendar Year	Beginning Fiduciary Position	Member Contributions	Employer Contributions	Benefit Payments	Administrative Expense	Investment Earnings	Ending Fiduciary Position
2022	\$ 318,872	\$ 0	\$ 17,902	\$ 49,968	\$ 999	\$ (24,459)	\$ 261,348
2023	261,348	0	18,379	54,016	894	7,297	232,114
2024	232,114	0	19,734	56,847	801	6,399	200,599
2025	200,599	0	20,176	51,234	721	5,545	174,365
2026	174,365	0	19,087	48,667	652	4,781	148,914
2027	148,914	0	18,758	43,681	591	4,088	127,488
2028	127,488	0	18,389	40,474	535	3,488	108,356
2029	108,356	0	17,968	37,245	484	2,956	91,551
2030	91,551	0	17,481	33,656	437	2,499	77,438
2031	77,438	0	15,845	30,213	394	2,103	64,779
2032	64,779	0	14,298	27,007	354	1,749	53,465
2033	53,465	0	13,311	24,144	317	1,438	43,753
2034	43,753	0	12,340	21,609	283	1,170	35,371
2035	35,371	0	11,393	19,151	252	942	28,303
2036	28,303	0	10,466	16,970	224	749	22,324
2037	22,324	0	9,572	14,930	198	587	17,355
2038	17,355	0	8,711	12,973	174	455	13,374
2039	13,374	0	7,650	11,489	154	342	9,723
2040	9,723	0	6,676	10,016	135	240	6,488
2041	6,488	0	5,995	8,579	118	154	3,940
2042	3,940	0	5,329	7,155	102	89	2,101
2043	2,101	0	4,663	5,888	87	43	832
2044	832	0	3,866	4,738	73	11	0
2045	0	0	3,151	3,714	60	0	0
2046	0	0	2,626	2,827	49	0	0
2047	0	0	2,049	2,061	39	0	0
2048	0	0	1,420	1,507	30	0	0
2049	0	0	932	1,023	23	0	0
2050	0	0	609	621	17	0	0
2051	0	0	339	275	11	0	0
2052	0	0	145	10	7	0	0
2053	0	0	48	9	4	0	0
2054	0	0	16	6	3	0	0
2055	0	0	11	4	2	0	0
2056	0	0	8	3	1	0	0
2057	0	0	5	2	1	0	0
2058	0	0	4	1	1	0	0
2059	0	0	2	0	0	0	0
2060	0	0	2	0	0	0	0
2061	0	0	1	0	0	0	0
2062	0	0	1	0	0	0	0
2063	0	0	0	0	0	0	0
2064	0	0	0	0	0	0	0
2065	0	0	0	0	0	0	0
2066	0	0	0	0	0	0	0
2067	0	0	0	0	0	0	0
2068	0	0	0	0	0	0	0
2069	0	0	0	0	0	0	0
2070	0	0	0	0	0	0	0

Appendix G: GASB 74 Present Value of Projected Benefit Payments

Table G-1: Present Value of Projected Benefit Payments (in thousands)

Calendar Year	Beginning Fiduciary Position	Benefit Payments	Funded Benefit Payments	Unfunded Benefit Payments	Present Value of Benefit Payments		
					Funded Payments at 3.00%	Unfunded Payments at 3.54%	Using Single Discount Rate of 3.08%
2022	\$ 318,872	\$ 49,968	\$ 49,968	\$ 0	\$ 49,235	\$ 0	\$ 49,216
2023	261,348	54,016	54,016	0	51,673	0	51,613
2024	232,114	56,847	56,847	0	52,798	0	52,695
2025	200,599	51,234	51,234	0	46,199	0	46,073
2026	174,365	48,667	48,667	0	42,606	0	42,457
2027	148,914	43,681	43,681	0	37,127	0	36,969
2028	127,488	40,474	40,474	0	33,399	0	33,231
2029	108,356	37,245	37,245	0	29,839	0	29,666
2030	91,551	33,656	33,656	0	26,179	0	26,006
2031	77,438	30,213	30,213	0	22,816	0	22,648
2032	64,779	27,007	27,007	0	19,801	0	19,640
2033	53,465	24,144	24,144	0	17,186	0	17,033
2034	43,753	21,609	21,609	0	14,934	0	14,790
2035	35,371	19,151	19,151	0	12,850	0	12,716
2036	28,303	16,970	16,970	0	11,055	0	10,931
2037	22,324	14,930	14,930	0	9,442	0	9,329
2038	17,355	12,973	12,973	0	7,966	0	7,864
2039	13,374	11,489	11,489	0	6,849	0	6,757
2040	9,723	10,016	0	10,016	0	5,263	5,714
2041	6,488	8,579	0	8,579	0	4,353	4,748
2042	3,940	7,155	0	7,155	0	3,507	3,842
2043	2,101	5,888	0	5,888	0	2,787	3,067
2044	832	4,738	0	4,738	0	2,166	2,394
2045	0	3,714	0	3,714	0	1,640	1,821
2046	0	2,827	0	2,827	0	1,206	1,344
2047	0	2,061	0	2,061	0	849	951
2048	0	1,507	0	1,507	0	599	675
2049	0	1,023	0	1,023	0	393	444
2050	0	621	0	621	0	230	262
2051	0	275	0	275	0	99	112
2052	0	10	0	10	0	3	4
2053	0	9	0	9	0	3	3
2054	0	6	0	6	0	2	2
2055	0	4	0	4	0	1	1
2056	0	3	0	3	0	1	1
2057	0	2	0	2	0	1	1
2058	0	1	0	1	0	0	0
2059	0	0	0	0	0	0	0
2060	0	0	0	0	0	0	0
2061	0	0	0	0	0	0	0
2062	0	0	0	0	0	0	0
2063	0	0	0	0	0	0	0
2064	0	0	0	0	0	0	0
2065	0	0	0	0	0	0	0
2066	0	0	0	0	0	0	0
2067	0	0	0	0	0	0	0
2068	0	0	0	0	0	0	0
2069	0	0	0	0	0	0	0
2070	0	0	0	0	0	0	0

