Public Sector

GASB 74 Actuarial Valuation Report

State of Tennessee

State Employee Group Plan

For the Fiscal Year Ending June 30, 2022

Measurement Date June 30, 2022

Introduction

This report documents the results of the actuarial valuation for the fiscal year ending June 30, 2022 of the State Employee Group Plan for the State of Tennessee. These results are based on a Measurement Date of June 30, 2022 and include medical benefits provided to the retirees and covered spouses by the State. All reporting requirements are included in the employer's financial statement. The information provided in this report is intended strictly for documenting information relating to the State and plan disclosure and reporting requirements.

Determinations for purposes other than the financial accounting requirements may be significantly different from the results in this report. Thus, the use of this report for purposes other than those expressed here may not be appropriate.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board. In addition, the valuation results are based on our understanding of the financial accounting and reporting requirements under U.S. Generally Accepted Accounting Principles as set forth in Government Accounting Standards Board Statement 74 (GASB 74) including any guidance or interpretations provided by the State and/or its audit partners prior to the issuance of this report. The information in this report is not intended to supersede or supplant the advice and interpretations of the State of Tennessee's auditors.

Models are used to estimate underlying per capita medical and prescription drug claims costs and plan design actuarial values, subsequently utilized as assumption inputs for valuation models used to develop the liabilities for FY 2020 and future valuations. The model used for the development of plan design actuarial value components was developed by experts outside of Aon, specifically Optum. The models used to estimate the Incurred But Not Paid (IBNP) Claims and COVID-19 claims impact were developed internally by Aon. All these models used for development of the per capita claims costs and future trend rates are centralized, monitored, and maintained by a dedicated expert team.

A valuation model was used to develop the liabilities for this valuation. The valuation model relies on ProVal software, which was developed by Winklevoss Technologies, LLC. Experts within Aon selected this software and determined it is appropriate for performing valuations. We coded and reviewed the software for the provisions, assumptions, methods, and data of the State Employee Group Plan.

A model was used to develop the appropriate GASB discount rate. The undersigned relied on experts at Aon for the development of the capital market assumptions and the model underlying the expected rate of return.

The valuation model outputs various cost scenarios. The “1% increase” and “1% decrease” interest rate scenarios vary only the discount rate assumption, in order to illustrate the impact of a change in that assumption in isolation. In practice, certain other assumptions, such as the expected or realized asset returns, would also be expected to vary when the discount rate changes. Therefore, the output from these scenarios should be used solely for assessing the impact of the discount rate in isolation and may not represent a realistic set of results for other purposes.

The “1% increase” and “1% decrease” healthcare cost trend scenarios vary only the healthcare cost trend assumption, in order to illustrate the impact of a change in that assumption in isolation. Therefore, the output from these scenarios should be used solely for assessing the impact of the healthcare cost trend in isolation and may not represent a realistic set of results for other purposes.

The valuation model was used to project certain financial results for the funded status projections. The valuation model relies on ProVal software, which was developed by Winklevoss Technologies, LLC and selected, reviewed, and evaluated by experts within Aon as appropriate for use for developing liabilities for funded status projections.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to (but not limited to) such factors as the following:

- Plan experience differing from that anticipated by the economic or demographic assumptions;
- Changes in actuarial methods or in economic or demographic 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); and
- Changes in plan provisions or applicable law.

Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

Funded status measurements shown in this report are determined based on various measures of plan assets and liabilities. For entity and plan disclosure and reporting purposes, funded status is determined using plan assets measured at market value. Plan liabilities are measured based on the interest rates and other assumptions summarized in the Actuarial Assumptions and Methods section of this report.

These funded status measurements may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, and funded status measurements for State of Tennessee and plan disclosure and reporting purposes may not be appropriate for assessing the need for or the amount of future contributions. In conducting the valuation, we have relied on personnel, plan design, health care claim cost, and asset information supplied by State of Tennessee as of the valuation date. While we cannot verify the accuracy of all the information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it has produced appropriate results.

The actuarial assumptions and methods used in this valuation are described in the Actuarial Assumptions and Methods section of this report. State of Tennessee selected the economic and demographic assumptions and prescribed them for use for purposes of compliance with GASB 74. Aon provided guidance with respect to these assumptions, and it is our belief that the assumptions represent reasonable expectations of anticipated plan experience.

The undersigned are familiar with the near-term and long-term aspects of OPEB valuations and collectively meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. The information provided in this report is dependent upon various factors as documented throughout this report, which may be subject to change. Each section of this report is considered to be an integral part of the actuarial opinions.

To our knowledge, no colleague of Aon providing services to State of Tennessee has any material direct or indirect financial interest in State of Tennessee. Thus, we believe there is no relationship existing that might affect our capacity to prepare and certify this actuarial report for State of Tennessee.

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Accounting Requirements

Development of GASB 74 Net OPEB Liability

Calculation Details

The following table illustrates the Net OPEB Liability under GASB 74.

	Fiscal Year Ending 6/30/2021	Fiscal Year Ending 6/30/2022
(1) OPEB Liability		
(a) Retired Participants and Beneficiaries Receiving Payment	$ 355,669,119	$ 350,918,622
(b) Active Participants	797,923,095	821,234,721
(c) Total	$ 1,153,592,214	$ 1,172,153,343
(2) Plan Fiduciary Net Position	(446,656,171)	(444,890,741)
(3) Net OPEB Liability	$ 706,936,043	$ 727,262,602
(4) Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	38.72%	37.95%

Reconciliation of Net OPEB Liability

Shown below are details regarding the Total OPEB Liability, Plan Fiduciary Net Position, and Net OPEB Liability for the Measurement Period from June 30, 2021 to June 30, 2022:

	Increase (Decrease)		
	Total OPEB Liability (a)	**Plan Fiduciary Net Position (b)**	**Net OPEB Liability (c) = (a) – (b)**
Balance Recognized at 6/30/2021 (Based on 6/30/2021 Measurement Date)	$ 1,153,592,214	$ 446,656,171	$ 706,936,043
Changes Recognized for the Fiscal Year:			
Service Cost	$ 38,848,973	N/A	$ 38,848,973
Interest on the Total OPEB Liability	69,383,774	N/A	69,383,774
Changes of Benefit Terms	0	N/A	0
Differences Between Expected and Actual Experience	(32,751,382)	N/A	(32,751,382)
Changes of Assumptions	16,235,258	N/A	16,235,258
Benefit Payments	(73,155,494)	(73,155,494)	0
Contributions From the Employer	N/A	142,226,071	(142,226,071)
Contributions From the Employee	N/A	0	0
Net Investment Income	N/A	(70,836,007)	70,836,007
Administrative Expense	N/A	0	0
Net Changes	$ 18,561,129	$ (1,765,430)	$ 20,326,559
Balance Recognized at 6/30/2022 (Based on 6/30/2022 Measurement Date)	$ 1,172,153,343	$ 444,890,741	$ 727,262,602

Plan Fiduciary Net Position Projection

The following table illustrates the projection of the fiduciary net position for use in the calculation of the discount rate as of June 30, 2022.

($ in thousands)

Year Ending June 30[2]	Beginning Fiduciary Net Position (a)	Total Contributions (b)	Benefit Payments (c)	Administrative Expenses (d)	Investment Earnings (e)	Ending Fiduciary Net Position[1] (f)
2022	$444,891	$415,734	$96,258	$0	$36,138	$800,505
2023	800,505	109,543	98,691	0	48,351	859,708
2024	859,708	74,877	101,745	0	50,788	883,628
2025	883,628	70,187	103,335	0	52,038	902,517
2026	902,517	68,495	103,258	0	53,123	920,879
2027	920,879	68,991	103,271	0	54,239	940,837
2028	940,837	67,044	103,320	0	55,378	959,939
2029	959,939	64,694	102,749	0	56,471	978,355
2030	978,355	62,182	102,990	0	57,495	995,043
2031	995,043	59,530	104,488	0	58,374	1,008,459
2032	1,008,459	56,722	107,380	0	59,010	1,016,811
2033	1,016,811	53,677	109,856	0	59,348	1,019,980
2034	1,019,980	50,267	111,572	0	59,386	1,018,062
2035	1,011,345	46,206	112,060	0	59,137	1,011,345
2036	1,011,345	36,402	112,949	0	58,418	993,215
2037	993,215	9,816	114,433	0	56,500	945,099
2038	945,099	0	114,656	0	53,316	883,759
2039	883,759	0	113,724	0	49,664	819,699
2040	819,699	10,073	113,508	0	46,124	762,388
2041	762,388	24,066	111,909	0	43,146	717,691
2042	717,691	27,232	110,496	0	40,600	675,027
2043	675,027	14,935	107,243	0	37,773	620,492
2044	620,492	0	105,019	0	34,125	549,598
2045	549,598	0	100,144	0	30,015	479,470
2046	479,470	0	95,791	0	25,936	409,616
2047	409,616	3,179	87,846	0	22,074	347,023
2048	347,023	8,706	80,211	0	18,707	294,225
2049	294,225	10,466	71,747	0	15,842	248,786
2050	248,786	5,848	64,297	0	13,199	203,537
2051	203,537	0	55,591	0	10,569	158,514

[1] (f) = (a) + (b) – (c) – (d) + (e)
[2] Years later than 2051 were omitted from this table.

Plan Fiduciary Net Position

The last year in which projected benefit payments are due from the Plan is 2115.

The Plan's projected fiduciary net position is not projected to reach $0.

As such, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "depletion date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.00% per annum was applied to all periods of projected benefit payments to determine the total OPEB liability as of June 30, 2022 shown earlier in this report, pursuant to paragraph 48 of GASB Statement No. 74.

In projecting the Plan's fiduciary net position the following assumptions were made:

1. Interest rate for discounting was 6.00% per annum.

2. Projected total contributions are employer contributions to the unfunded actuarial accrued liability and normal cost (including administrative expenses). Based on the closed amortization period in place, the unfunded liability is projected to be paid off in 2037. Contributions are assumed to be paid mid-year.

3. Assumed contributions are based on the contribution policy of the State of Tennessee as communicated on July 1, 2019. The State of Tennessee will contribute no less than the Actuarially Determined Contribution, as authorized by Pub. Ch. No. 426.

4. Projected benefit payments have been determined in accordance with Paragraphs 43-47 of GASB Statement No. 74, and are based on the closed group of active, retired members and beneficiaries as of July 1, 2021. Benefit payments are assumed to be paid mid-year.

5. Projected investment earnings are based on the assumed investment rate of return of 6.00% per annum. The first year's earnings have been adjusted to account for the actual return through June 30, 2022.

Interest Rate Sensitivity

The following table illustrates the impact of interest rate sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2021:

	1% Decrease (5.00%)	**Current Rate (6.00%)**	**1% Increase (7.00%)**
(1) Total OPEB Liability	$ 1,234,713,885	$ 1,153,592,214	$ 1,078,829,607
(2) Plan Fiduciary Net Position	(446,656,171)	(446,656,171)	(446,656,171)
(3) Net OPEB Liability (Asset)	$ 788,057,714	$ 706,936,043	$ 632,173,436

The following table illustrates the impact of interest rate sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2022:

	1% Decrease (5.00%)	**Current Rate (6.00%)**	**1% Increase (7.00%)**
(1) Total OPEB Liability	$ 1,252,787,727	$ 1,172,153,343	$ 1,097,318,135
(2) Plan Fiduciary Net Position	(444,890,741)	(444,890,741)	(444,890,741)
(3) Net OPEB Liability (Asset)	$ 807,896,986	$ 727,262,602	$ 652,427,394

Healthcare Cost Trend Sensitivity

The following table illustrates the impact of healthcare cost trend sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2021:

	1% Decrease	**Trend Rate**	**1% Increase**
(1) Total OPEB Liability	$ 1,047,491,008	$ 1,153,592,214	$ 1,276,110,643
(2) Plan Fiduciary Net Position	(446,656,171)	(446,656,171)	(446,656,171)
(3) Net OPEB Liability (Asset)	$ 600,834,837	$ 706,936,043	$ 829,454,472

The following table illustrates the impact of healthcare cost trend sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2022:

	1% Decrease	**Trend Rate**	**1% Increase**
(1) Total OPEB Liability	$ 1,064,683,404	$ 1,172,153,343	$ 1,296,072,506
(2) Plan Fiduciary Net Position	(444,890,741)	(444,890,741)	(444,890,741)
(3) Net OPEB Liability (Asset)	$ 619,792,663	$ 727,262,602	$ 851,181,765

Disclosure—Changes in the Net OPEB Liability and Related Ratios

Changes in the Net OPEB Liability and Related Ratios[1]

	Fiscal Year Ending			
	2019	2020	2021	2022
Total OPEB Liability				
Service Cost	$ 65,979,347	$ 40,418,423	$ 40,282,484	$ 38,848,973
Interest Cost	50,851,664	72,619,139	70,591,234	69,383,774
Changes of Benefit Terms	0	0	0	0
Differences Between Expected and Actual Experiences	0	(37,424,987)	(25,926,493)	(32,751,382)
Changes of Assumptions	(199,731,387)	(31,241,931)	(29,108,622)	16,235,258
Benefit Payments	(92,950,959)	(80,140,035)	(75,863,907)	(73,155,494)
Net Change in Total OPEB Liability	$ (175,851,335)	$ (35,769,391)	$ (20,025,304)	$ 18,561,129
Total OPEB Liability (Beginning)	1,385,238,244	1,209,386,909	1,173,617,518	1,153,592,214
Total OPEB Liability (Ending)	$ 1,209,386,909	$ 1,173,617,518	$ 1,153,592,214	$ 1,172,153,343
Plan Fiduciary Net Position				
Contributions—Employer	$ 301,486,469	$ 153,021,695	$ 148,609,312	$ 142,226,071
Contributions—Member	0	0	0	0
Net Investment Income	5,167,197	(4,434,769)	91,761,168	(70,836,007)
Benefit Payments	(92,950,959)	(80,140,035)	(75,863,907)	(73,155,494)
Administrative Expense	0	0	0	0
Other	0	0	0	0
Net Change in Plan Fiduciary Net Position	$ 213,702,707	$ 68,446,891	$ 164,506,573	$ (1,765,430)
Plan Fiduciary Net Position (Beginning)	0	213,702,707	282,149,598	446,656,171
Plan Fiduciary Net Position (Ending)	$ 213,702,707	$ 282,149,598	$ 446,656,171	$ 444,890,741
Net OPEB Liability (Ending)	$ 995,684,202	$ 891,467,920	$ 706,936,043	$ 727,262,602
Net Position as a Percentage of OPEB Liability	17.67%	24.04%	38.72%	37.95%
Covered-Employee Payroll	$ 2,886,193,518	$ 3,082,586,938	$ 2,694,954,425	$ 2,990,076,134
Net OPEB Liability as a Percentage of Payroll	34.50%	28.92%	26.23%	24.32%
Actuarially Determined Contribution				
Actuarially Determined Contribution	$ 135,810,151	$ 145,396,683	$ 137,074,607	$ 126,303,230
Contributions Made in Relation to the Actuarially Determined Contribution	301,486,469	153,021,695	148,609,312	142,226,071
Contribution Deficiency (Excess)	$ (165,676,318)	$ (7,625,012)	$ (11,534,705)	$ (15,922,841)
Covered-Employee Payroll	$ 2,886,193,518	$ 3,082,586,938	$ 2,694,954,425	$ 2,990,076,134
Contributions as a Percentage of Payroll	10.4%	5.0%	5.5%	4.8%

[1] GASB 75 was effective first for employer fiscal years beginning after June 15, 2017.

Investment Return

	2019	2020	2021	2022
Annual money weighted rate of return, net of investment expenses	5.02%	-1.77%	29.02%	-14.68%

Plan Fiduciary Net Position

The following table illustrates the projection of the fiduciary net position as of June 30, 2021 and June 30, 2022.

	Year Ending June 30, 2021	Year Ending June 30, 2022
Assets		
Cash and deposits	$ 3,275,900	$ 31,173,854
Receivables		
Contributions	0	0
Due from broker for investments sold	0	0
Investment income	2,409	14,198
Loans	823,221	936,005
Total receivables	$ 4,101,530	$ 950,203
Investments at Fair Value		
Mutual Funds	$ 447,932,763	$ 417,134,498
Total assets	$ 452,034,293	$ 449,258,555
Liabilities		
Payables		
Accounts payable and accruals	$ (5,378,122)	$ (4,367,814)
Unearned revenues	0	0
Total liabilities	$ (5,378,122)	$ (4,367,814)
Net position restricted for postemployment benefits other than pensions	$ 446,656,171	$ 444,890,741

Statement of Changes in Fiduciary Net Position

		Year Ending June 30, 2021		Year Ending June 30, 2022
Additions				
Employer contributions	$	148,609,312		142,226,071
Investment income:				
Net increase in fair value of investments	$	87,506,495	$	(81,835,745)
Interest and dividends		8,059,520		10,999,738
Net Securities Lending Income		0		0
Net investment income	$	95,566,015	$	(70,836,007)
Total Additions		244,175,327		71,390,064
Deductions				
Benefit payments	$	(75,863,907)		(68,887,133)
Administrative expense[1]		(3,804,847)		(4,268,361)
Total deductions	$	(79,668,754)		(73,155,494)
Change in net position	$	164,506,573		(1,765,430)
Net position restricted for postemployment benefits other than pensions				
Beginning of year	$	282,149,598	$	446,656,171
End of year	$	446,656,171	$	444,890,741

[1] Administrative expenses have been included as part of the benefit payments for GASB 74 purposes effective year ending June 30, 2022.

Appendix

Participant Data

The actuarial valuation was based on personnel information from State of Tennessee records as of July 1, 2021. Following are some of the pertinent characteristics from the personnel data as of that date. Prior valuation characteristics are also provided for comparison purposes. Both age and service have been determined using years and months as of the valuation date.

	July 1, 2020	July 1, 2021
Health Care Participants		
Active Participants		
Number	42,216	39,152
Average Age	49.3	49.7
Average Service	15.2	15.8
Inactive Participants		
Retirees and Surviving Spouses	7,132	6,697
Average Age	61.4	61.5
Entitled to but Not Yet Receiving Benefit Payments	107	139
Average Age	55.4	56.6
Total Participants		
Number	49,455	45,988

Counts do not include covered spouses.

Asset Allocation

The long-term expected rate of return on OPEB plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of OPEB plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of geometric real rates of return for each major asset class included in the OPEB plan's target asset allocation as of June 30 are summarized in the following table[1]:

Asset Class	Expected Nominal Rate of Return	Expected Real Rate of Return	Allocation
Large Cap U.S. Equity	6.44%	4.10%	33.00%
International (Non-U.S.) Equity (Developed)	7.17%	4.81%	16.00%
Emerging Markets Equity	7.70%	5.33%	4.00%
Cash (Gov't)	2.02%	-0.22%	5.00%
Long Duration Bonds – Gov't / Credit	2.58%	0.32%	25.00%
U.S. REITs	5.23%	2.91%	10.00%
Private Debt -- Direct Lending	6.04%	3.71%	7.00%
Total Portfolio	5.89%	3.56%	100.00%

The discount rate used to measure the total OPEB liability is 6.00%. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the actuarially determined contribution rates. For this purpose, only employer contributions that are intended to fund benefits of current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs of future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on these assumptions, the OPEB Fund's fiduciary net position was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on OPEB Plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability.

[1] These rates of return reflect the State of Tennessee's best estimate.

Health Care Claims Development

The sample per capita claims cost assumptions shown below by age, benefit, and plan represent the true underlying baseline experience estimated for State Employee Group Plan's sponsored postretirement benefits and costs. These rates are used in the expense calculation for the period July 1, 2021–July 1, 2022 and disclosures as of June 30, 2022.

Age	Medical/Rx/Admin
55	$ 11,194
60	$ 13,832
65	$ 7,184
70	$ 8,490
75	$ 9,494
80	$ 9,992
85	$ 10,352
90+	$ 10,551

For pre-65 and post-65 retiree claims, retiree claims developed using historical claims.

Historical Claims and Enrollment Basis

The average medical or Rx per capita claims costs were developed from actual claims experience and enrollment for the period from January 1, 2019 through December 31, 2021. Claims and enrollment information was provided by the State of Tennessee's health care vendors. The annualized paid claims experience for each respective historical base period was adjusted to an incurred basis by adding the change the estimated change in reserve. Claims experience was adjusted for differences in plan design between the historical periods and the projection period using plan design relative values from Aon's actuarial models. No adjustment was necessary for large claims. The average medical or Rx per capita claims costs from each respective historical base period were trended to, already centered at the mid-point of the annual period following the valuation date.

In order to improve the credibility of a single projection estimate, a combination of estimates from the distinct historical periods was used, placing higher credibility on the most recent period and lower creditability on the older periods.

Finally, average medical or Rx per capita claims costs were then age-adjusted based on the demographics of the population, and the assumed health care aging factors shown in the table below.

Per capita administration and other fixed costs were developed and added onto the per capita claims cost assumptions using information supplied by the State of Tennessee. These per capita assumed administrative costs were based on actual 2021 per employee rates, which were converted from a per employee basis to a per member basis using the most recent election file provided by the State of Tennessee. For 2021, $388 annually per person was added for pre-65 retirees, post-65 retirees and spouses.

Health Care Aging (Morbidity) Factors:

Since health care costs increase with age, and an OPEB valuation is by its nature an analysis of a closed group that will age throughout the measurement, the effect that this aging of the population will have on claims costs must be reflected in the valuation. The claim costs for medical and prescription drugs and Rx were assumed to increase with age according to the table below.

Age Band	Medical	Rx	Composite
40-44	3.00%	4.80%	3.3%
45-49	3.70%	4.70%	3.8%
50-54	4.20%	4.70%	4.3%
55-59	4.40%	4.60%	4.4%
60-64	3.70%	4.60%	3.8%
65-69	2.70%	3.80%	3.1%
70-74	1.80%	2.50%	2.1%
75-79	2.20%	0.80%	1.4%
80-84	2.80%	0.20%	1.3%
85-89	1.40%	0.10%	0.6%
90+	0.00%	0.00%	0.0%

The aging factor assumptions shown above were based on normative data analyses, along with consideration of the results from the 2013 Society of Actuaries sponsored study “Health Care Costs—From Birth to Death” prepared by Dale H. Yamamoto, reporting on the effect of age on claims costs. In addition to age, this study shows the effect of service type (medical vs. pharmacy) and gender on claims costs.

Health Care Cost Trend Rates:

The health care cost trend assumptions shown below were based on national average information from a variety of sources, including S&P Healthcare Economic Index, NHCE data, plan renewal data, and vendor Rx reports, with adjustments based on the provisions of the benefits sponsored by the State of Tennessee.

Year	Pre-65	Post-65
2022	7.36%	7.32%
2023	6.77%	6.83%
2024	6.07%	6.30%
2025	5.71%	5.88%
2026	5.36%	5.46%
2027	5.01%	5.04%
2028	4.66%	4.62%
2029	4.50%	4.52%
2030	4.50%	4.50%
2031	4.50%	4.50%
2032+	4.50%	4.50%

For 2022 to 2023, trends include estimated impacts from COVID-19. We expect COVID-19 impact to be short-term in nature, with claims trend returning to normal in 2024 and beyond. Therefore, we do not believe COVID-19 has a significant impact on long-term claims costs projections and plan liabilities. The estimated impact to trend for these years is 0.9% for pre-65 and 0.3% for post-65, on average.

Actuarial Assumptions and Methods

The following outlines the assumptions and method Aon will use in determining the GASB expense calculations for the State Employee Group Plan for the fiscal year ending June 30, 2022.

Actuarial Method	Entry Age Normal Cost Method
Normal Cost	Determined for each active employee as the Actuarial Present Value of benefits allocated to the valuation year. The benefit attributed to the valuation year is that incremental portion of the total projected benefit earned during the year in accordance with the plan provisions. This allocation is based on each individual's service between date of hire and date the individual becomes fully eligible for benefits.
Asset Valuation Method	Market Value of Assets as of the Measurement Date
Discount Rate	The State has selected 6.00% compounded annually. The State's Funding Policy is expected to provide sufficient revenue over time to enable the OPEB Trust to be the sole provider of the benefits. It is assumed that this assumption will be supported by the Investment Policy.
Expected Return on Assets	6.00%
Mortality Rates	Pre-retirement: PUB-2010 Headcount-Weighted Employee mortality table projected generationally with MP-2020 from the central year. Post-retirement tables are Headcount- Weighted Below Median Healthy Annuitant and adjusted with a 6% load for males and a 14% load for females, projected generationally from 2010 with MP-2020. Disabled: Reflects those used by TCRS and are taken from the gender distinct table published in the IRS Revenue Ruling 96-7 for disabled lives with a 10% load, projected generationally using MP-2020.
Valuation Date	July 1, 2021
Measurement Date	June 30, 2022
Census Data	July 1, 2021
Fiscal Year Ending	June 30, 2022

Inflation	Long-term price inflation is assumed to be 2.25% per year.
Data Assumptions	In cases of a discrepancy between expected service and service reported for this valuation, imputed service was used.
Salary Increases	Assumed salary increases are the same as used by TCRS: 8.72% at age 20 graded to 3.44% at age 70 (with 4.00% weighted average).
Demographic Assumptions- General	Unless noted otherwise, demographic assumptions employed in this Actuarial Valuation were the same as those employed in the July 1, 2021 for a Group I employees in the Pension Actuarial Valuation of the Tennessee Consolidated Retirement System (TCRS). These demographic assumptions were developed by TCRS from an Actuarial Experience Study (undertaken on behalf of TCRS) and are considered appropriate for use in this OPEB Actuarial Valuation. These include assumed rates of future salary increases, termination, mortality, disability, and retirement.
Retirement Rates	See Table 1.
Withdrawal Rates	See Table 2.
Disability Rates	See Table 3.
Expected Retiree Contributions	Members are required to make monthly contributions in order to maintain their coverage. For the purpose of this Valuation a weighted average has been used with weights derived from the current distribution of members among plans offered. Such average expected retiree premium contributions for the first year, before any direct State subsidies, are shown in the table below.

Average Premium (as of Valuation Date)
$842/month

Coverage Acceptance Rates	Following are the assumptions as to future Medical Coverage Acceptance Rates. Acceptance rates, presented below, result from an analysis of the choice pattern exhibited by employees retiring in recent years. Retirees changing coverage to The Tennessee Plan are considered lapsing coverage for the purpose of this Valuation.

Coverage Acceptance for Pre-65 Elections		
Subsidy Level	Total Acceptance Rate	Percentage of Retirees Electing Dual Coverage
80%	90%	45%
70%	60%	30%
60%	45%	22.5%

Future participation	Active employees currently declining coverage are assumed to opt into the plan in the future and accept retiree coverage at a 10% rate. Covered employees are assumed to remain covered until retirement.
Decrement Timing	Decrements of all types are assumed to occur at the middle of the year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Decrement Relativity	Decrement rates are treated as absolute rates of decrement.

Method Changes

There have been no method changes since the prior year.

Assumption Changes

The financial accounting valuation reflects the following assumption changes:

- The long term inflation was increased from 2.1% to 2.25%.
- The medical and drug trend rate assumptions were updated to reflect more recent experience and a change in expected per capita health claims to reflect more recent information as of the Measurement Date. These changes increased liability by 4.4%.
- Coverage acceptance rates for certain employers were updated to reflect more recent subsidy amounts. This change decreased liability by 8.2%.
- A change in retirement, withdrawal and mortality rates to match those provided by TCRS. These changes increased liability by 5.8%.

Rationale for Assumptions

For each economic and demographic assumption that has a significant effect on the measurement, and that the actuary has determined does not significantly conflict with what, in the actuary's professional judgment, is reasonable for the purpose of the measurement, the information and analysis used to support this determination are described in more detail in the document entitled "OPEB Assumptions for FYE June 30, 2022" and dated March 31, 2022.

Actuarial Assumptions and Methods

Table 1

Retirement Rates

Early and Normal Retirement Prior to Age 60 with 10 Years of Service Unreduced Retirement Annual Rates		
Age	**Male**	**Female**
45	1.9910%	2.4710%
46	2.0160%	2.3870%
47	2.0810%	2.3590%
48	2.1760%	2.3830%
49	2.2830%	2.4580%
50	6.0000%	7.5000%
51	6.0000%	7.5000%
52	6.0000%	7.5000%
53	6.0000%	7.5000%
54	6.5000%	7.5000%
55	6.5000%	7.5000%
56	7.0000%	8.0000%
57	7.0000%	8.0000%
58	7.5000%	8.0000%
59	8.0000%	8.0000%

An additional 9.0% is added to the rates shown above for employees in a year in which they are first eligible for unreduced retirement prior to age 60.

Normal Retirement Age (60 with 10 Years of Service)

	Normal Retirement (Age 60 with 10 Years of Service) Unreduced Retirement Annual Rates			
	Less than 15 Years of Service		**15 or More Years of Service**	
Age	**Male**	**Female**	**Male**	**Female**
60	8.5%	9.0%	11.5%	12.0%
61	11.0%	12.0%	14.0%	15.0%
62	16.0%	18.0%	19.0%	21.0%
63	12.0%	12.0%	15.0%	15.0%
64	14.0%	14.0%	17.0%	17.0%
65	22.0%	22.0%	25.0%	25.0%
66-74	15.5%	17.0%	18.5%	20.0%
75	100.0%	100.0%	100.0%	100.0%

These rates do not include separation on account of death or disability.

Table 2

Withdrawal Rates

The following table shows sample annual rates of withdrawal for participants. Note, these rates do not include separation due to death or disability. In addition, any employee terminating with at least five years of service and who are within five years of Normal Retirement are assumed to commence monthly pension benefits and, thus, become eligible to accept retiree medical coverage.

% Separating Within Next Year										
	Male									
Years of Service	Attained Age									
	20	25	30	35	40	45	50	55	60	65
0	30.0%	25.4%	23.0%	20.8%	18.6%	16.5%	14.8%	15.3%	17.9%	24.0%
1	24.6%	21.4%	18.6%	16.1%	13.8%	12.0%	11.1%	11.6%	14.4%	20.5%
2 or More	19.5%	15.9%	10.5%	5.8%	2.8%	2.0%	2.4%	2.9%	4.7%	--
	Female									
Years of Service	Attained Age									
	20	25	30	35	40	45	50	55	60	65
0	30.0%	25.4%	23.0%	20.8%	18.6%	16.5%	14.8%	15.3%	17.9%	24.0%
1	24.6%	21.4%	18.6%	16.1%	13.8%	12.0%	11.1%	11.6%	14.4%	20.5%
2 or More	20.2%	16.3%	11.4%	6.9%	3.8%	2.5%	2.6%	3.8%	5.4%	--

Table 3

Disability Rates

The following table shows sample annual rates of disability.

% Becoming Disabled Within Next Year		
Sample Ages	**Male**	**Female**
20	0.06%	0.03%
25	0.06%	0.03%
30	0.07%	0.04%
35	0.11%	0.06%
40	0.16%	0.14%
45	0.22%	0.24%
50	0.27%	0.33%
55	0.27%	0.38%
60	--	--
65	--	--

Actuarial Assumptions and Methods

Discussion of Actuarial Assumptions and Methods

State of Tennessee selected the economic, demographic and health care claim cost assumptions and prescribed them for use for purposes of compliance with GASB 74. Aon provided guidance with respect to these assumptions, and it is our belief that the assumptions represent reasonable expectations of anticipated plan experience. Mortality, retirement, withdrawal, and disability rates as well as assumed salary increases were developed by TCRS from the 2021 Actuarial Experience Study. An evaluation of the reasonability and consistency of these assumptions is beyond the scope of the assignment. Coverage acceptance rates were reviewed and updated by Aon for the current valuation based on the past two years of experience.

Calculation of Normal Costs and Liabilities

The method used to calculate the service cost and accumulated postretirement benefit obligation for determining OPEB expense is the entry age normal cost method. Under this cost method, the actuarial accrued liability is based on a prorated portion of the present value of all benefits earned to date over expected future working lifetime as defined by GASB. The proration is determined so that the cost with respect to service accrued from date of hire is recognized as a level percentage of pay each year. The Normal Cost is equal to the prorated cost for the year of the valuation.

Accounting Information under GASB 74

Benefit obligations and expense/(income) are calculated under U.S. Generally Accepted Accounting Principles as set forth in Government Accounting Standards Board Statement 74.

The total OPEB liability represents the actuarial present value of benefits based on the entry age normal cost method as of the measurement date. The service cost represents the actuarial present value of benefits that are attributed to the 2022 fiscal year, reflecting the effect of assumed future health care claim cost and/or pay increases.

Plan Provisions

Eligibility to Participate

All full-time state and higher education employees (hired before July 1, 2015), retirees and vested terminated participants of The State of Tennessee who satisfy the Disability, Vested Termination, Early or Normal Retirement provisions of the Tennessee Consolidated Retirement System (TCRS) may be eligible for certain post-employment benefits under the Tennessee State Employees Group Plan. Any employee, with exception of state judges, becoming members of TCRS on or after July 1, 1976 enters TCRS Group I regardless of employment classification.

Employer Subsidy

State Subsidy as a Percent of Base Premium*	
Service at Retirement	**State Subsidy**
30+ years of service	80%
20-29 years of service	70%
Less than 20 years of service	60%

* Subsidy amount is based on the premium rates applicable to coverage under the lower cost plan and carrier.

Eligibility for Retirement

Normal Retirement

Group I eligibility retirements under TCRS

- Earlier of (i) Age 60 with five years of creditable service, or (ii) Any age with 30 years of creditable service

Early Retirement

Group I eligibility retirements under TCRS:

- Age 55 with five years of creditable service, or
- Reduced pension benefit upon completion of 25 years of service at any age

Eligibility for Medical Insurance

TCRS Participants

- Ten years of creditable service with state, higher education or participating Local Education agency and three years continuous of insurance coverage in a state-sponsored insurance plan immediately prior to final termination for retirement. The date retirement pension benefits start (effective date of retirement with TCRS) must be on or before the date active state coverage ends. or
- Twenty or more years of creditable service with state, higher education or participating Local

Education agency and one year of continuous insurance coverage in a state-sponsored insurance plan immediately prior to final termination for retirement. The date retirement pension benefits start (effective date of retirement with TCRS) may be up to five years after active state coverage ends.

- If the individual is retiring through TCRS, they must be receiving a monthly retirement benefit to continue coverage as a retiree. TCRS participants who choose a lump-sum retirement benefit are not eligible to continue insurance at retirement.

Other Participants

For ORP (Optional Retirement Program) participants, non-elects (individuals who declined optional membership in the Tennessee Consolidated Retirement System), and state employees on federal appointment not eligible for federal insurance programs, the following rules apply:

- Age 55 with at least 10 but less than 20 total years of creditable service with state, higher education or participating Local Education agency and three years of continuous insurance coverage in a state sponsored insurance plan immediately prior to final termination for retirement. The date retirement insurance benefits start must immediately follow active coverage ending. or
- Age 55 and 20 or more years of creditable service with state, higher education or participating Local Education agency and one year of continuous insurance coverage in a state-sponsored insurance plan immediately prior to final termination for retirement. The period of time between final termination date and attainment of age 55 may be up to five years. or
- 25 years of creditable service with state, higher education or participating Local Education agency and one year of continuous insurance coverage in a state-sponsored insurance plan immediately prior to final termination for retirement. The period of time between final termination date and commencement of retirement insurance may be up to five years.

Disability Retirement	Retirees who have documentation of SSA disability or have been approved by TCRS for disability retirement, have a date of hire prior to July 1, 2015 and who were participants in a state-sponsored plan at the time of the injury or illness which resulted in their disability may continue coverage provided that no lapse in medical coverage has occurred by meeting either the requirements for TCRS participants, ORP (Optional Retirement Program) participants and other non-TCRS participants outlined above, or by having at least five years of creditable service immediately prior to final termination due to disability.
Plan Benefits	Eligible retirees may choose among the same Medical Plan options available for similarly situated active employees of the State. Dependents of retirees who continue to meet eligibility requirements may be covered at the retiree's option the same as dependents of active employees, provided those dependents were already enrolled in the Plan when the retiree's active coverage was terminated or they became eligible based on a special enrollment provision. Prescription Drug coverage is automatically extended to retirees and their dependents who continue coverage under any one of the Medical Plan options. Covered retirees and their dependents are subject to the same Medical and Prescription benefits as are active employees. Totally and permanently disabled pre-65 retirees may continue medical coverage. Disabled retirees under age 65 who are eligible for Medicare must maintain at least Part B coverage.

Certain Other Post-Employment Benefits (OPEB) are available to current retirees and all employees (hired before July 1, 2015) retiring from the State under the provisions of Disability, Early or Normal Retirement, as described above. With exception of a small group of grandfathered individuals, retirees are required to discontinue coverage under the plan upon attaining age 65. The OPEB benefits include access to coverage for the retiree and dependents under the Medical, Prescription, Dental and Vision as described below.

- Dental and vision benefits for retirees and their dependents are fully paid by the retirees, as they are by employees and their dependents. Consequently, these benefits are not considered as other post-employment benefits for the purposes of GASB Statement No. 74.

- The surviving dependents of a retiree may stay in the plan at no cost for up to six months. Afterwards, the surviving dependents are eligible to continue coverage under the State Employee Group Plan subject to payments of the applicable premiums. The surviving dependents must continue to meet eligibility requirements to remain enrolled in the plan.
- Former employees, retirees and dependents may be eligible for an extended benefit under COBRA, regardless of the terms of the employer's other post-employment benefits. COBRA benefits are not considered as other post- employment benefits for the purposes of GASB Statement No. 74.

Duration of Benefits

Retirees and their dependents that are age-eligible for Medicare benefits are not eligible to remain in the State Employee Group Insurance Plan, but may apply for the Medicare Supplement plan (The Tennessee Plan) if they are receiving a monthly TCRS pension benefit or are an ORP participant. A Medicare eligible spouse may only be covered on the Tennessee Plan if the retiree is also covered. Retirees not eligible for Medicare benefits are allowed to remain on the core State Plan, with the plan as a primary payor. If the retiree later becomes eligible for Medicare Part A by virtue of a spouse's eligibility, the coverage will be terminated.

Plan Changes Since the Prior Year

There have been no plan changes since the prior year.