

# Retirement Plan Study

A Study of the Costs and Benefits Anticipated through Participation  
in the Tennessee Consolidated Retirement System

April 1, 2020

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## Summary of Results

An actuarial valuation was performed as of April 1, 2020 to examine the cost of any benefits provided by the Tennessee Consolidated Retirement System (TCRS) as it would apply to the West Cumberland Utility District if the group joined the TCRS on that date.

The TCRS offers three different plan design options for political subdivisions, referred to throughout this report as Plan 1, Plan 2, and Plan 3. Each of the three plans has a unique set of benefits and corresponding costs. The description of the benefits can be found in the Plan Provisions section of this report. The summary of the annual employer costs as a percentage of payroll for each of the three plans is shown in the table below. Further, within Plan 1 and Plan 2, each political subdivision can elect whether to include or exclude cost of living benefits in its retirement plan. If cost of living benefits are included, they must be “advance funded” in the same manner as other retirement benefits. Costs have been developed both “with” and “without” cost of living benefits for Plan 1 and Plan 2. Plan 3 is required to include cost of living benefits.

Each political subdivision joining the TCRS also has the option of whether or not to include employees' past service (service earned prior to the date of joining the TCRS) in the determination of benefits. If past service is included, the political subdivision may elect whether or not to limit the past service to a selected number of years. Further, the included years of past service may be fully purchased by the employer, or the employee can be made to be responsible for voluntarily purchasing the past service with the employer accepting its share of the liability for any years that the employee purchases. The prospective annual employer cost as a percentage of payroll for each of the past service scenarios currently considered by the entity is shown below.

	Plan 1		Plan 2		Plan 3
	Without COLA	With COLA	Without COLA	With COLA	With COLA
<b>Past Service Scenarios</b>					
1. 5 Years of Past Service (Employee purchases up to 5 years at 5%)	7.53%	10.78%	4.20%	6.30%	2.95%
2. 10 Years of Past Service (Employee purchases up to 10 years at 5%)	8.46%	12.19%	4.56%	6.91%	3.19%

The above results assume that employees will contribute 5% of pay toward the future cost of their retirement benefit. Alternatively, the entity may elect to charge only 2.5% employee contributions or to require no employee contributions, in which case TCRS will increase the above results by 2.5% or 5%, respectively.

**Plan 1 Without COLA**

	<b>Past Service Scenarios*</b>	
	<b>Scenario 1</b>	<b>Scenario 2</b>
(a) Present Value of Benefits	184,931	209,753
(b) Accrued Liability	47,595	76,010
(c) Present Value of Future Employee Contributions	66,470	66,470
(d) Present Value of Future Normal Costs (a) - (b) - (c)	70,866	67,273
(e) Normal Cost	6,337	5,968
(f) Normal Cost Contribution (e) x 1.03625	6,567	6,184
(g) Current Payroll	119,855	119,855
(h) Normal Cost Rate (f) / (g)	5.48%	5.16%
(i) Employee Past Service Contribution	24,551	36,849
(j) Unfunded Accrued Liability (b) - (i)	23,044	39,161
(k) Unfunded Accrued Liability Contribution (j) x .08973 x 1.03625	2,143	3,641
(l) Accrued Liability Contribution Rate (k) / (g)	1.79%	3.04%
(m) Active Participant Count	3	3
(n) Administrative Expense (m) x \$103	309	309
(o) Administrative Expense Rate (n) / (g)	0.26%	0.26%
(p) Total Employer Contribution (f) + (k) + (n)	9,019	10,134
(q) Total Employer Contribution Rate (h) + (l) + (o)	7.53%	8.46%

\*Past Service Scenarios: Scenario 1 = 5 Years of Past Service (Employee purchases up to 5 years at 5%)

Scenario 2 = 10 Years of Past Service (Employee purchases up to 10 years at 5%)

**Plan 1 With COLA**

	<b>Past Service Scenarios*</b>	
	<b>Scenario 1</b>	<b>Scenario 2</b>
(a) Present Value of Benefits	226,754	257,850
(b) Accrued Liability	58,578	94,037
(c) Present Value of Future Employee Contributions	66,470	66,470
(d) Present Value of Future Normal Costs (a) - (b) - (c)	101,706	97,343
(e) Normal Cost	9,116	8,669
(f) Normal Cost Contribution (e) x 1.03625	9,446	8,983
(g) Current Payroll	119,855	119,855
(h) Normal Cost Rate (f) / (g)	7.88%	7.49%
(i) Employee Past Service Contribution	24,551	36,849
(j) Unfunded Accrued Liability (b) - (i)	34,027	57,188
(k) Unfunded Accrued Liability Contribution (j) x .08973 x 1.03625	3,164	5,318
(l) Accrued Liability Contribution Rate (k) / (g)	2.64%	4.44%
(m) Active Participant Count	3	3
(n) Administrative Expense (m) x \$103	309	309
(o) Administrative Expense Rate (n) / (g)	0.26%	0.26%
(p) Total Employer Contribution (f) + (k) + (n)	12,919	14,610
(q) Total Employer Contribution Rate (h) + (l) + (o)	10.78%	12.19%

\*Past Service Scenarios: Scenario 1 = 5 Years of Past Service (Employee purchases up to 5 years at 5%)

Scenario 2 = 10 Years of Past Service (Employee purchases up to 10 years at 5%)

**Plan 2 Without COLA**

	<b>Past Service Scenarios*</b>	
	<b>Scenario 1</b>	<b>Scenario 2</b>
(a) Present Value of Benefits	145,211	162,524
(b) Accrued Liability	36,687	57,949
(c) Present Value of Future Employee Contributions	68,849	68,849
(d) Present Value of Future Normal Costs (a) - (b) - (c)	39,675	35,726
(e) Normal Cost	3,466	3,077
(f) Normal Cost Contribution (e) x 1.03625	3,592	3,189
(g) Current Payroll	119,855	119,855
(h) Normal Cost Rate (f) / (g)	3.00%	2.66%
(i) Employee Past Service Contribution	24,551	36,849
(j) Unfunded Accrued Liability (b) - (i)	12,136	21,100
(k) Unfunded Accrued Liability Contribution (j) x .08973 x 1.03625	1,128	1,962
(l) Accrued Liability Contribution Rate (k) / (g)	0.94%	1.64%
(m) Active Participant Count	3	3
(n) Administrative Expense (m) x \$103	309	309
(o) Administrative Expense Rate (n) / (g)	0.26%	0.26%
(p) Total Employer Contribution (f) + (k) + (n)	5,029	5,460
(q) Total Employer Contribution Rate (h) + (l) + (o)	4.20%	4.56%

\*Past Service Scenarios: Scenario 1 = 5 Years of Past Service (Employee purchases up to 5 years at 5%)

Scenario 2 = 10 Years of Past Service (Employee purchases up to 10 years at 5%)

**Plan 2 With COLA**

	<b>Past Service Scenarios*</b>	
	<b>Scenario 1</b>	<b>Scenario 2</b>
(a) Present Value of Benefits	172,691	193,391
(b) Accrued Liability	43,872	69,526
(c) Present Value of Future Employee Contributions	68,849	68,849
(d) Present Value of Future Normal Costs (a) - (b) - (c)	59,970	55,016
(e) Normal Cost	5,251	4,762
(f) Normal Cost Contribution (e) x 1.03625	5,441	4,935
(g) Current Payroll	119,855	119,855
(h) Normal Cost Rate (f) / (g)	4.54%	4.12%
(i) Employee Past Service Contribution	24,551	36,849
(j) Unfunded Accrued Liability (b) - (i)	19,321	32,677
(k) Unfunded Accrued Liability Contribution (j) x .08973 x 1.03625	1,796	3,038
(l) Accrued Liability Contribution Rate (k) / (g)	1.50%	2.53%
(m) Active Participant Count	3	3
(n) Administrative Expense (m) x \$103	309	309
(o) Administrative Expense Rate (n) / (g)	0.26%	0.26%
(p) Total Employer Contribution (f) + (k) + (n)	7,546	8,282
(q) Total Employer Contribution Rate (h) + (l) + (o)	6.30%	6.91%

\*Past Service Scenarios: Scenario 1 = 5 Years of Past Service (Employee purchases up to 5 years at 5%)

Scenario 2 = 10 Years of Past Service (Employee purchases up to 10 years at 5%)

**Plan 3 With COLA**

	<b>Past Service Scenarios*</b>	
	<b>Scenario 1</b>	<b>Scenario 2</b>
(a) Present Value of Benefits	128,626	144,330
(b) Accrued Liability	32,543	51,628
(c) Present Value of Future Employee Contributions	68,849	68,849
(d) Present Value of Future Normal Costs (a) - (b) - (c)	27,234	23,853
(e) Normal Cost	2,394	2,061
(f) Normal Cost Contribution (e) x 1.03625	2,481	2,136
(g) Current Payroll	119,855	119,855
(h) Normal Cost Rate (f) / (g)	2.07%	1.78%
(i) Employee Past Service Contribution	24,551	36,849
(j) Unfunded Accrued Liability (b) - (i)	7,992	14,779
(k) Unfunded Accrued Liability Contribution (j) x .08973 x 1.03625	743	1,374
(l) Accrued Liability Contribution Rate (k) / (g)	0.62%	1.15%
(m) Active Participant Count	3	3
(n) Administrative Expense (m) x \$103	309	309
(o) Administrative Expense Rate (n) / (g)	0.26%	0.26%
(p) Total Employer Contribution (f) + (k) + (n)	3,533	3,819
(q) Total Employer Contribution Rate (h) + (l) + (o)	2.95%	3.19%

\*Past Service Scenarios: Scenario 1 = 5 Years of Past Service (Employee purchases up to 5 years at 5%)

Scenario 2 = 10 Years of Past Service (Employee purchases up to 10 years at 5%)



### Distribution of Active Participants with Average Compensation

Attained Age	Years of Service										Total
	Under 1	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39	
Under 25											
25 - 29											
30 - 34											
35 - 39											
40 - 44		2 \$35,700									2 \$35,700
45 - 49						1 \$48,454					1 \$48,454
50 - 54											
55 - 59											
60 - 64											
65 - 69											
Over 69											
<b>Total</b>		<b>2</b> <b>\$35,700</b>				<b>1</b> <b>\$48,454</b>					<b>3</b> <b>\$39,952</b>

## Outline of Plan Provisions

(Plan provisions for Plan 1, Plan 2, and Plan 3 are the same except where indicated)

### 1. Eligibility

All employees included on the census form were considered to be eligible.

### 2. Credited Service

Credited Service means the period of a member's continuous service on or after the valuation date since his last date of employment with the employer, and may also include service prior thereto. Retirement credit for part-time service is granted on a pro-rata basis in direct proportion to the schedule of a full-time employee.

### 3. Normal Retirement

#### (a) Condition

The normal retirement date is the first day of the month coincident with or next following the earlier of:

#### **Plan 1**

The 60th birthday of the employee, or the date the employee completes 30 years of credited service, but in no case before the employee has completed 5 years of credited service.

#### **Plan 2 and Plan 3**

The 65th birthday of the employee, or the date the employee's age and years of credited service sum to 90, but in no case before the employee has completed 5 years of credited service.

#### (b) Benefit

The normal retirement benefit, 1/12th of which is paid monthly for life, is determined as follows:

#### **Plan 1**

1-1/2% of average earnings plus 1/4% of average earnings in excess of the social security integration level, all multiplied by the number of years of creditable service.

In no event shall the benefit exceed 90% of average earnings, or be less than \$8.00 per month per year of credited service.

“Average earnings” is the average annual earnings of a member for the five consecutive years of credited service which produce the highest average.

“Social security integration level” is an amount which in 2017 is \$75,000 but which will be adjusted upward in the future to reflect changes in the average salary covered by social security.

The benefit actually payable will be 105% of the benefit calculated according to the formula described above.

**Plan 2**

1-4/10% of average earnings multiplied by the number of years of creditable service.

In no event shall the benefit exceed the lessor of 90% of average earnings or \$80,000 (indexed annually), or be less than \$8.00 per month per year of credited service.

“Average earnings” is the average annual earnings of a member for the five consecutive years of credited service which produce the highest average.

**Plan 3**

1% of average earnings multiplied by the number of years of creditable service.

In no event shall the benefit exceed the lessor of 90% of average earnings or \$80,000 (indexed annually), or be less than \$8.00 per month per year of credited service.

“Average earnings” is the average annual earnings of a member for the five consecutive years of credited service which produce the highest average.

**4. Early Retirement**

A vested member may terminate employment and receive a reduced retirement benefit upon:

**Plan 1**

Attaining age 55, or completing 25 years of credited service.

**Plan 2 and Plan 3**

Attaining age 60, or the date the employee’s age and years of credited service sum to 80.

**5. Delayed Retirement**

(a) Condition

A member may postpone his retirement beyond his normal retirement date and continue to accrue retirement credit.

(b) Benefit

The benefit, commencing on the first day of the month following the member's actual date of retirement, is the benefit computed in the same manner as in 3(b) above for normal retirement, with the computation being made as of the member's actual retirement date.

**6. Disability Retirement**

(a) Condition

In the event a member becomes totally and permanently disabled after completion of 5 years of credited service, he may retire and receive a disability retirement benefit.

(b) Benefit

The disability retirement benefit, commencing on the first day of the month immediately following determination of disability and payable during the continuance of disability, is computed in the same manner as in 3(b) above for normal retirement, with the computation being made as of the member's date of termination of employment, except that the minimum period of credited service used shall be the lesser of 20 years or the total number of years the member would have completed at his normal retirement date, but not less than ten years of creditable service; however, the disability retirement benefit will be 90% of the benefit otherwise applicable. The disability retirement benefit changes to normal service benefit (including projected years of service) when the conditions for normal service retirement are met.

**7. Death Before Retirement**

(a) Condition

If the death of a member occurs before he is eligible for retirement, a death benefit will be paid to his designated beneficiary.

(b) Benefit

If the death of the member occurs after he has completed 10 years of credited service, the benefit is payable if a surviving spouse has been designated as beneficiary, and is equal to the amount that would have been payable at the member's normal retirement date if he had terminated employment on the date of his death and had elected a 100% joint and survivor optional retirement benefit, discounted for each month by which the member fell short of satisfying the requirements for normal retirement (using the respective plan's early retirement reduction factors).

**8. Termination of Employment With Vested Benefit**

If a member terminates his employment after completion of 5 years of credited service he may elect to leave his contribution (if any) in the plan until he meets the age eligibility requirements for benefits and makes application.

If such a former member becomes disabled before his benefits commence, he can elect to begin to receive the actuarial equivalent of his deferred vested benefit immediately. If such a former member with at least 10 years of credited service dies before his benefits commence, the death benefit described in item 7(b) above is payable, based on the amount of the former member's deferred vested benefit, discounted for election of the 50% joint and survivor option and for early receipt.

**9. Other Termination of Employment**

If employment is otherwise terminated before retirement, no benefits are provided under the plan, and the member will receive a refund of his contributions (if any) to the plan with interest.

**10. Optional Methods of Benefit Payment**

Subject to the applicable plan conditions, a member may select an optional method of benefit payment, in lieu of the prescribed straight life income, which is actuarially equivalent thereto. The purpose of the optional method is to provide a continued life income to a surviving beneficiary after the death of a member.

**11. Minimum Benefit of Refund of Member Contribution for Retired Members**

The total of the benefits paid from the plan to a member and his spouse or beneficiary will in no event be less than the member's contributions plus interest to his date of termination of employment.

**12. Benefit Increase After Retirement**

Each year the retirement benefits being paid are subject to an increase determined by applying a formula based on the increase in the Consumer Price Index. The maximum increase is 3% of the current benefit amount, provided the political subdivision elects to participate in the cost-of-living adjustments.

**13. Member Contribution**

Each general employee member contributes an amount equal to 5% of his compensation each year, unless the political subdivision authorizes a noncontributory retirement plan or requires employee contributions of 2.5% of compensation.

**14. Employer Contribution**

The Employer contributes actuarially determined amounts to finance the plan benefits not supported by member contributions.

**15. Investment of Funds**

The plan assets are invested in a trust fund with the trustees of the state retirement system. The investment earnings provide a source of funding toward the cost of the pension plan.

## Summary of Actuarial Assumptions

### Interest Rate

7.25% per annum

### Social Security Projection

3.0% per annum increase in Taxable Wage Base

### Valuation Method

Entry Age Normal

	AGE			
	20	35	50	60
<b>Mortality Rates (per 1,000 lives)</b>				
Generational mortality improvement projected after year 2014 under Projection Scale MP-2016 (Sample mortality rates are shown below as of year 2014)				
Male – Non-Annuitant	0.39	0.55	1.75	4.85
Male – Annuitant	--	--	4.31	8.93
Female – Non-Annuitant	0.17	0.30	1.11	2.63
Female – Annuitant	--	--	2.76	5.98
<b>Withdrawal Rates (per 1,000 lives)</b>				
First Year	262.41	206.70	169.85	204.07
Second Year	217.72	170.01	130.43	148.83
Ultimate Male	137.34	50.96	27.75	46.20
Ultimate Female	196.10	77.16	37.91	53.20
<b>Disablement Rates (per 1,000 lives)</b>				
Male	0.32	0.33	3.75	0.00
Female	0.32	0.33	3.75	0.00
<b>Mortality Rates for Disabled Lives (per 1,000 lives)</b>				
Male	8.35	14.76	25.99	39.80
Female	6.37	11.97	18.15	24.88
<b>Salary Scale (Sy+1/Sy)</b>	1.085	1.056	1.039	1.035

### Rate of Normal Retirement

Assume retirement according to a pattern based on experience

This report has been prepared under the supervision of , a member of the American Academy of Actuaries, a Fellow of the Society of Actuaries, and a consulting actuary with Findley, who has met the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions herein. To the best of our knowledge this report has been prepared in accordance with generally accepted actuarial standards, including the overall appropriateness of the analysis, assumptions, and results and conforms to appropriate Standards of Practice as promulgated from time to time by the Actuarial Standards Board, which standards form the basis for the actuarial report. We are not aware of any direct or material indirect financial interest or relationship, including investment management or other services that could create, or appear to create, a conflict of interest that would impair the objectivity of our work.

February 7, 2020

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Date