

# Consolidated Judicial Retirement System of North Carolina

Statement of the Results of the Experience  
Investigation and Recommended Revised  
Tables for Adoption by the Board of Trustees  
Prepared as of December 31, 2014





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

Members of the Board:

An investigation of the mortality, service and compensation experience of members and beneficiaries of the Consolidated Judicial Retirement System of North Carolina (the "Retirement System") has been made. This investigation covers the five-year period from January 1, 2010 to December 31, 2014. As a result of the investigation, it is recommended that revised tables be adopted by the Board for future use.

#### **Experience for Active Members**

The number of members expected to separate from active service was obtained using the rates currently used for the valuations and the members exposed to the rates. The expected separations were then compared with the actual separations. Based on the comparison of actual separations to expected separations and taking into account reasonable expectations of the future, proposed assumption changes have been made. The non-inflationary, nonproductively component of the salary scale was developed by analyzing actual versus expected merit increases during the five-year period.

The results of the investigation indicate that, in our view, the assumed salary increases and the rates of separation from active service due to mortality and retirement do not accurately reflect the actual and anticipated experience of the Retirement System. As a result of the investigation, new active service tables have been developed that more closely reflect the actual experience of the membership.

#### **Experience for Retired Members and Survivors of Deceased Members**

An investigation of the experience for retired members and survivors of deceased members was prepared separately by gender and cause of retirement. The expected deaths were determined by applying the assumed rates of mortality used for valuation purposes to the number of members in each retirement category. A comparison was then made between the expected and actual deaths in each retirement category.

The results of the investigation indicate that the assumed rates of mortality do not accurately reflect the actual and expected experience of the Retirement System. As a result of the investigation, we are recommending new mortality tables.

## Summary

This report contains tables showing a comparison of the actual and expected cases of separation from active service, salary increases due to merit and actual and expected number of deaths among retired members and survivors of deceased members. A comparison between the rates presently in use and the recommended revised rates are also shown in this report. The table of contents outlines the material contained in this report.

The recommended rates of separation from active service, rates of salary increase and other demographic assumptions are shown in the attached tables in Schedule A of this report. In the actuary's judgment, the rates recommended are suitable for use until further experience indicates that modifications are desirable.

We have also included, in Schedule A, the economic assumptions and funding methods related to the December 31, 2014 valuation of the Retirement System, but such economic assumptions and funding methods are not part of the scope of this experience investigation report.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. Because of limited scope, Buck performed no analysis of the potential range of such future differences.

The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Respectfully submitted,



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# Section 1: Post-Retirement Mortality

The Retirement System currently uses mortality tables that vary by age, gender and health status (i.e., disabled and healthy). The current mortality rates are based on published tables and based on studies that cover significant portions of the U.S. population. The healthy mortality rates also contain a provision to reflect future mortality improvements. The following table shows that, in total, the current mortality tables result in expected mortality rates significantly higher than the actual mortality rates. In addition, recent studies of the U.S. population have determined that the rates of mortality improvement in the U.S. have differed from those predicted by the projection scale currently in use (Scale AA). Further, the current mortality tables do not provide for mortality improvements for members disabled at retirement.

Therefore, we are recommending that the Board adopt a set of mortality tables that better reflect the experience of the Retirement System. The recommended mortality tables are also based on recent studies that cover significant portions of the U.S. population, allow for future mortality improvements based on recent studies (Scale MP-2014) and apply mortality improvement to all members, including those disabled at retirement. Scale MP-2014 includes a two-dimensional improvement assumption that is a function of both age and calendar year.

Post-Retirement Mortality						
Male						
Age	Exposed	Actual	Expected	Actual to Expected Ratio	Proposed	Actual to Proposed Ratio
Total	1,525	46	59	78%	47	98%
Female						
Age	Exposed	Actual	Expected	Actual to Expected Ratio	Proposed	Actual to Proposed Ratio
Total	573	13	16	81%	13	100%

# Section 2: Active Mortality

The Retirement System currently uses mortality tables that vary by age and gender. The current mortality rates are based on published tables and based on recent studies that cover significant portions of the U.S. population. The mortality rates also contain a provision to reflect future mortality improvements. There have only been seven active deaths over the last five years.

Therefore, we are recommending that the Board adopt a set of mortality tables consistent with the mortality experience of retirees. The recommended mortality tables are the corresponding active employee table to the post-retirement rates recommended. The recommended mortality tables continue to vary by age and gender.

## Section 3: Rates of Retirement

The Retirement System currently uses retirement rates that vary by age. The following table shows that, in total, the retirement rates result in expected retirements less than actual retirements.

Therefore, we are recommending that the Board adopt a set of retirement rates that better reflect the experience of the Retirement System and the expectations for future retirements.

Unreduced Retirement						
<u>Age</u>	<u>Exposed</u>	<u>Actual</u>	<u>Expected</u>	<u>Actual to Expected Ratio</u>	<u>Proposed</u>	<u>Actual to Proposed Ratio</u>
50 to 54	369	9	5	180%	9	100%
55 to 59	453	29	21	138%	27	107%
60 to 64	453	31	22	141%	30	103%
65 to 69	246	27	54	50%	29	93%
>=70	53	18	53	34%	36	50%
Total	1,574	114	155	74%	131	87%

## Section 4: Termination Rates

Termination rates measure the probability that a member will leave prior to retirement eligibility. The Retirement System currently uses no termination rates. Actual termination rates have been less than 3% per year over the last five years. Therefore, we are recommending no change to the termination rates.

## Section 5: Disability Rates

Disability rates measure the probability that a member will become disabled and receive a disability retirement benefit. The Retirement System currently uses disability rates that vary by age. There have only been two reported disabilities over the last five years. As the disability retirement benefit has little impact on the liability for active members, we are recommending no change in the disability rates.

## Section 6: Individual Salary Increase Rates

Individual salary increase rates reflect the increases in a member's salary that are not related to across-the-board type increases (i.e., inflation and productivity). The salary increase rates include elements of salary increase due to promotions and longevity (collectively referred to as "merit increases"). The analysis for these rates is based on analyzing actual versus expected merit increases (i.e., removing the effects of inflation and productivity) for the five-year period of this investigation. Using this comparison, all salaries reflect recent experience such that prior inflation and productivity increases are consistent and can be ignored. We are recommending that the Board adopt a set of salary increase rates that reflect the experience of the Retirement System and the expectations for future increases.

<u>Service</u>	<u>Average Prior Year Salaries (in 000s)</u>	<u>Average Actual Merit-Only Salaries (in 000s)</u>	<u>Actual Underlying Merit Increase</u>	<u>Average Expected Merit-Only Salaries (in 000s)</u>	<u>Expected Merit Increase</u>	<u>Actual to Expected Ratio</u>	<u>Average Proposed Merit-Only Salaries (in 000s)</u>	<u>Proposed Merit Increase</u>	<u>Actual to Proposed Ratio</u>
1 to 5	112,206	113,048	0.75%	114,874	2.38%	98.4%	114,107	1.69%	99.1%
6 to 10	119,706	119,756	0.04%	122,254	2.13%	98.0%	121,159	1.21%	98.8%
11 to 15	126,193	126,557	0.29%	128,569	1.88%	98.4%	127,115	0.73%	99.6%
16 to 20	135,134	134,938	-0.15%	137,570	1.80%	98.1%	135,676	0.40%	99.5%
21 to 25	132,021	132,362	0.26%	134,171	1.63%	98.7%	132,084	0.05%	100.2%
26 to 30	136,528	136,017	-0.37%	138,647	1.55%	98.1%	136,528	0.00%	99.6%
31+	118,916	118,601	-0.26%	120,762	1.55%	98.2%	118,916	0.00%	99.7%

## Section 7: Summary and Cost of Changes

As a result of the experience investigation, we are recommending revised rates of mortality, retirement and salary increase for active members, and revised rates of mortality for retired members and survivors of deceased members.

Based on the results of the December 31, 2014 valuation, and these proposed demographic assumptions, the accrued liability of the Retirement System will increase from \$566,830,508 to \$587,644,354 and the required contribution will increase from 25.09% of payroll to 27.99% of payroll if such proposed assumptions were reflected in the December 31, 2014 valuation. However, it is our understanding that such assumptions, if adopted, would be applied to the December 31, 2015 valuation.

Note: The cost impacts listed above only apply to demographic-type assumptions. Economic assumptions including investment return, real rate of return, general and wage inflation and real wage growth are not included in this report. Additionally, funding methods such as asset valuation method, actuarial cost method and amortization method are not included in this report.

# Appendix A: Statement of Actuarial Assumptions and Methods

INTEREST RATE: 7.25% per annum, compounded annually.

INFLATION: Both general and wage inflation are assumed to be 3.00% per annum.

REAL WAGE GROWTH: 0.50% per annum.

ADMINISTRATIVE EXPENSES: 0.75% of normal cost.

WITHDRAWAL: No termination of employment is assumed to occur prior to retirement, other than death or disability.

SEPARATIONS BEFORE RETIREMENT: Representative values of the assumed annual rates of separation are as follows:

<u>Annual Rate of</u>	
<u>Age</u>	<u>Disability</u>
25	.0001
30	.0001
35	.0003
40	.0007
45	.0014
50	.0023
55	.0047
60	.0077
64	.0098

MARRIAGE ASSUMPTION: 90% of male members married and 50% of female members married with the male spouses four years older than female spouses.

REPORTED COMPENSATION: Calendar year compensation as furnished by the system's office.

VALUATION COMPENSATION: Reported compensation adjusted to reflect the assumed rate of pay as of the valuation date.

ACTUARIAL COST METHOD: Projected unit credit. Projected benefits and the corresponding liabilities are allocated on proration by creditable service.

ASSET VALUATION METHOD: Actuarial value. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected actuarial value of assets, based on the assumed valuation rate of return. The amount recognized each year is 20% of the difference between market value and expected actuarial value. The actuarial value of assets is not allowed to be greater than 120% of the market value of assets or less than 80% of the market value of assets.

TIMING OF ASSUMPTIONS: All withdrawals, deaths, disabilities, retirements and salary increases are assumed to occur July 1 of each year.

# Appendix A: Statement of Actuarial Assumptions and Methods

**DEATHS AFTER RETIREMENT (NON-DISABLED):** According to the RP-2014 Mortality tables for retirees. The active employee rates of RP-2014 are used for ages less than 50.

**DEATH AFTER DISABILITY:** RP-2014 Mortality tables for disabled annuitants.

**DEATHS PRIOR TO RETIREMENT:** According to the RP-2014 Mortality tables for active employees.

**MORTALITY PROJECTION (NON-DISABLED):** All mortality rates are projected from 2014 using Scale MP-2014.

**LIABILITY FOR INACTIVE MEMBERS:** The liability for members who terminated prior to five years of creditable service is estimated to be 100% of the member's accumulated contributions. The liability for members who terminated after completing five years of creditable service is estimated based on the member's current age and the service and reported compensation at termination of employment.

# Appendix A: Statement of Actuarial Assumptions and Methods

## CJRS Retirement Rates

### Male and Female

Age	Service					
	<u>&lt;= 3</u>	<u>4</u>	<u>5 to 22</u>	<u>23</u>	<u>24</u>	<u>&gt;=25</u>
<=39	0.000	0.000	0.000	0.000	0.000	0.000
40 to 49	0.000	0.000	0.000	0.000	0.000	0.150
50 to 54	0.000	0.000	0.000	0.100	0.100	0.150
55 to 59	0.000	0.000	0.025	0.050	0.050	0.150
60 to 64	0.000	0.000	0.025	0.200	0.200	0.125
65	0.000	0.100	0.100	0.100	0.100	0.100
66 to 69	0.000	0.125	0.125	0.125	0.125	0.125
70	0.000	0.500	0.500	0.500	0.500	0.500
71	0.000	0.500	0.500	0.500	0.500	0.500
>=72	0.000	1.000	1.000	1.000	1.000	1.000

# Appendix A: Statement of Actuarial Assumptions and Methods

## CJRS Salary Merit Scales

<u>Service</u>	<u>Rate</u>
0	0.0200
1	0.0190
2	0.0180
3	0.0170
4	0.0160
5	0.0150
6	0.0140
7	0.0130
8	0.0120
9	0.0110
10	0.0100
11	0.0090
12	0.0080
13	0.0070
14	0.0060
15	0.0055
16	0.0050
17	0.0045
18	0.0040
19	0.0035
20	0.0025
21	0.0015
22	0.0005
23	0.0000
24	0.0000
>= 25	0.0000