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**TEACHERS' RETIREMENT SYSTEM
OF THE STATE OF KENTUCKY
STATEMENT OF RESULTS OF THE
EXPERIENCE INVESTIGATION
PREPARED AS OF JUNE 30, 2010**

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

September 9, 2011

Board of Trustees
Teachers' Retirement System of
  The State of Kentucky
479 Versailles Road
Frankfort, KY 40601-3800

Members of the Board:

An investigation of the mortality, service and compensation experience of active and retired members of the Teachers' Retirement System of the State of Kentucky has been made covering the five-year period from July 1, 2005 to June 30, 2010. As a result of the investigation, it is recommended that revised tables be adopted by the Board for future use.

The number of members expected to separate from active service and the expected number of post-retirement deaths were obtained by use of the rates determined in the last experience investigation and adopted by the Board of Trustees on September 18, 2006. The results of the investigation indicate that the assumed rates of separation from active service due to withdrawal, disability and retirement, and rates of post-retirement mortality, do not accurately reflect the actual and anticipated experience of the Retirement System. As a result of the investigation, new withdrawal, disability, retirement and mortality tables have been developed which reflect more closely the actual experience of the membership.

This report shows a comparison of the actual and expected cases of separation from active service, actual and expected number of deaths, and actual and expected salary increases. These tables are shown based on current assumed expected rates and based on new proposed expected rates.

Board of Trustees
September 9, 2011
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A comparison between the rates of separation and mortality presently in use and the recommended revised rates are also shown in this report.

The recommended rates of separation, death and salary increase at each age are shown in the attached tables in Schedule A of this report. For convenience, we have included a resolution for adoption of these revised assumptions in Schedule B. In the actuary's judgment, the rates recommended are suitable for use until further experience indicates that modifications are desirable.

Respectfully submitted,

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Section I
Executive Summary

The following summarizes the findings and recommendations with regard to the assumptions utilized for the Kentucky Teachers' Retirement System. Detailed explanations for the recommendations are found in the sections that follow.

Economic Assumption Changes

The table below lists the three primary economic assumptions used in the actuarial valuation and their current and proposed rates.

Item	Current	Proposed
Price Inflation	4.00%	3.50%
Ultimate Investment Rate of Return	7.50%	7.50%
Wage Inflation	4.00%	4.00%

We are recommending that the Board adopt a Smoothed Interest Rate Methodology whereby the investment rate of return expected to be earned during a 25 year look forward period beginning on the valuation date and the actual returns earned during the 5 year look back period will result in an average rate of return over the combined 30 year period equivalent to the Ultimate Investment Rate of Return of 7.50%. A corridor of 0.50% around the ultimate investment rate of return will be applied in determining the smoothed interest rate.

Recommended Demographic Assumption Changes

The table below lists the demographic assumptions used in the actuarial valuation and any recommended changes to these assumptions based on the experience of the last five years.

Demographic	Assumption Changes
Withdrawal	Change rates to more closely reflect experience
Pre-Retirement Mortality	Change to prescribed table that matches Post-Retirement Mortality
Disability	Lower rates for most ages
Service Retirement	Change rates to more closely reflect experience
Post-Retirement Mortality	Change to RP2000 Combined Mortality Table
Salary Scale	No Changes

Recommended Other Assumption Changes

The table below lists the other assumptions used in the actuarial valuation and any recommended changes based on the experience of the last five years.

Assumption	Change
Actuarial Cost Method	Change from Projected Unit Credit (PUC) to Entry Age Normal (EAN) Cost Method
Unused Sick Leave	Increase Assumption from 1% to 2%

The Entry Age Normal (EAN) Cost Method is used in over 90% of all public sector pension plans and will be the only basis for the new Governmental Accounting Standards Board (GASB) requirements that will be effective in 2013. While cost methods merely allocate the present value of future benefits between what has been accrued to date versus what will occur in the future, the EAN cost method puts more weight on past accrued liability and less on future normal costs. Therefore, the Unfunded Accrued Liability under the EAN method will be higher than the Projected Unit Credit (PUC) Cost Method.

Financial Impact

The following table highlights the impact of the recommended changes on the unfunded accrued liability (UAL), funding ratio and employer annual required contribution rate.

Pension Results
($ in Thousands)

System	Valuation Results 2010	After All Changes
Unfunded Accrued Liability	$9,492,896	$10,418,016
Funding Ratio	61.0%	58.8%
Annual Required Contribution		
University	32.32%	32.59%
Non-University	35.92%	36.19%

In addition, we reviewed the financial impact of the recommended changes on the UAL, funding ratio and employer annual required contribution rate for the Retiree Medical and Life Insurance Funds. The impacts shown below reflect all the demographic changes as well as the change in the Actuarial Cost Method from PUC to EAN. The results do not show the impact of the Smoothed Interest Rate Methodology.

OPEB Results – Retiree Medical Insurance Fund
($ in Thousands)

System	Valuation Results 2010	After Changes
Unfunded Accrued Liability	$2,965,582	$3,327,645
Funding Ratio	7.5%	6.8%
Annual Required Contribution	7.20%	7.57%
Discount Rate	8.00%	8.00%

OPEB Results – Life Insurance Fund
($ in Thousands)

System	Valuation Results 2010	After Changes
Unfunded Accrued Liability	$4,186	$(1,012)
Funding Ratio	95.5%	101.2%
Annual Required Contribution	0.05%	0.04%
Discount Rate	7.50%	7.50%

Section II
Economic Assumptions

There are three economic assumptions used in the actuarial valuations performed for the Kentucky Teachers' Retirement System. They are:

- Price Inflation
- Ultimate Investment Return
- Wage Inflation

The Actuarial Standards Board has issued Actuarial Standard of Practice (ASOP) No. 27, *"Selection of Economic Assumptions for Measuring Pension Obligations"*, which provides guidance to actuaries in selecting economic assumptions for measuring obligations under defined benefit plans. As noted in ASOP No. 27, because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes based on a mixture of past experience and future expectations. These estimates therefore are best stated as a range utilizing the actuary's professional judgment. In setting the range and the single point within that range to use, the actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

In our opinion, the economic assumptions recommended in this report have been developed in accordance with ASOP No. 27. The following table shows our recommendations followed by detailed discussions of each assumption.

Item	Current	Proposed
Price Inflation	4.00%	3.50%
Real Rate of Return	3.50	4.00%
Ultimate Investment Return	7.50%	7.50%
Price Inflation	4.00%	3.50%
Real Wage Growth	0.00	0.50
Wage Inflation	4.00%	4.00%

Price Inflation

Background: As can be seen from the table on the previous page, assumed price inflation is used as the basis for both the ultimate investment return assumption and the wage inflation assumption. These latter two assumptions will be discussed in detail in the following sections.

It is important that the price inflation assumption be consistently applied throughout the economic assumptions utilized in an actuarial valuation. This is called for in ASOP No. 27 and is also required to meet the parameters for determining pension liabilities and expense under Governmental Accounting Standards Board (GASB) Statements No. 25 and 27.

The current price inflation assumption is 4.00% per year.

Past Experience: The Consumer Price Index, US City Average, All Urban Consumers, CPI (U), has been used as the basis for reviewing historical levels of price inflation. The level of that index in June of each of the last 50 years is provided in Appendix A.

In analyzing this data, annual rates of inflation have been determined by measuring the compound growth rate of the CPI (U) over various time periods. The results are as follows:

Period	Inflation
2001-2010	2.4%
1991-2000	2.9%
1981-1990	4.6%
1971-1980	7.9%
1961-1970	2.7%
1991-2010	2.6%
1981-2010	3.3%
1971-2010	4.4%
1961-2010	4.1%

The graph below shows the annual increases in the CPI (U) over the entire 50 year period.

Annual CPI (U) Increases
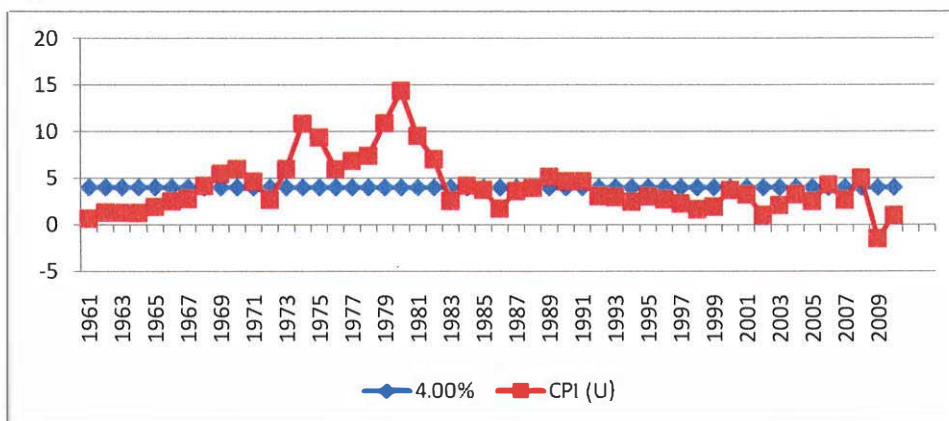
Recommendation: It is difficult to accurately predict inflation. Inflation's short-term volatility is illustrated by comparing its average rate over the last 10, 30 and 50 years. Although the 10-year average of 2.4% is significantly lower than KTRS' assumed rate of 4.00%, the longer 40 and 50-year averages of 4.4% and 4.1% respectively, are all slightly higher than KTRS' rate. The validity of KTRS' assumption is, therefore, dependent upon the emphasis one assigns to the short and long-terms.

Current economic forecasts suggest lower inflation but are generally looking at a shorter time period than appropriate for our purposes. In the 2010 OASDI Trustees Report, the Chief Actuary for Social Security bases the 75 year cost projections on an intermediate inflation assumption of 2.8% with a range of 1.8% to 3.8%. We concur in general with a range of 2.0% - 4.0%, and recommend use of a 3.50% per year rate recognizing the likely inflation pressures built into the economy at the current time.

Price Inflation Assumption	
Current	4.00%
Reasonable Range	2.00% - 4.00%
Recommended	3.50%

Ultimate Investment Return

Background: The assumed investment return is one of the most significant assumptions in the annual actuarial valuation process as it is used to discount the expected benefit payments for all active, inactive and retired members of the divisions. Minor changes in this assumption can have a major impact on valuation results. The investment return assumption should reflect the asset allocation target for the funds set by the Board of Trustees.

The current assumption is 7.50%, consisting of a price inflation assumption of 4.00% and a real rate of return assumption of 3.50%. The return is net of all investment and administrative expenses.

Past Experience: The assets for KTRS are valued using a widely accepted asset-smoothing methodology that fully recognizes the expected investment income and also recognizes 20% of each year's investment gain or loss (the difference between actual and expected investment income). The recent experience over the last five years is shown in the table below.

Year Ending 6/30	Actuarial Value	Market Value
2006	4.38%	5.34%
2007	5.24	14.56
2008	2.65	(6.46)
2009	0.70	(14.64)
2010	0.47	13.44
Average	2.67%	1.80%

Because of the significant variability in past year-to-year results and the inter-play of inflation on those results in the short term, we prefer to base our investment return assumption on the capital market assumptions utilized by the Board in setting investment policy and the asset allocation established by the Board as a result of that policy. This approach is referred to as the building block method in ASOP No. 27.

Analysis: The current capital market assumptions and asset allocation are shown in Appendix B. Using stochastic projection results provides an expected range of real rates of return over a 50 year time horizon. Looking at one year results produces an expected real return of 4.69% but also has a high standard deviation or measurement of volatility. By expanding the time horizon, the average return does not change much but the volatility declines significantly. The following table provides a summary of results.

Time Span In Years	Mean Real Return	Standard Deviation	Real Returns by Percentile				
			5th	25th	50th	75th	95th
1	5.99%	13.94%	-15.11%	-3.78%	5.32%	14.85%	29.94%
5	5.23%	6.30%	-4.97%	0.85%	5.06%	9.43%	15.77%
10	5.12%	4.50%	-2.07%	2.02%	5.02%	8.11%	12.67%
20	4.97%	3.17%	-0.19%	2.84%	4.94%	7.08%	10.29%
30	4.96%	2.60%	0.71%	3.19%	4.96%	6.67%	9.25%
40	4.95%	2.27%	1.21%	3.46%	4.97%	6.45%	8.66%
50	4.94%	2.01%	1.57%	3.63%	4.95%	6.28%	8.27%

The percentile results are percentage of the 5,000 random series that produce returns over the time span shown of less than the amount indicated. Thus for the 10 year time span, 5% of the resulting real rates of return were below -2.07% and 95% were above that. As the time span increases, the results begin to merge. Over a 50 year time span, the results indicate there is a 25% chance that real returns will be below 3.63% and a 25% chance they will be above 6.28%. In other words there is a 50% chance the real returns will be between 3.63% and 6.28%.

Administrative and Investment Expenses: The investment return is assumed to be net of administrative and investment expenses. The table below compares, for the last four years, the expense levels during the fiscal year to the market value of assets for KTRS at the end of the fiscal year (all $ in thousands).

FY Ending June 30	Administrative Expenses	Investment Expenses	Total Expenses	Market Value of Assets	Expense Ratio
2007	$7,3512	$8,668	$16,020	$15,422,590	0.10%
2008	7,552	9,500	17,052	14,076,692	0.12
2009	8,166	16,322	24,488	11,515,884	0.21
2010	8,830	18,206	27,036	12,456,619	0.22

Obviously, there was an increase in the Investment Expense ratio in 2009. We would not expect the expense ratio long term to exceed 0.22% and are recommending that level in setting the net investment return assumption.

Recommendation: Using the building block approach of ASOP No. 27 and the projection results outlined above, we are recommending a range for the investment return assumption of the 25th to 75th percentile real returns over the 50 year time span plus the recommended inflation assumption less the recommended expense ratio. The following table details the range.

Item	25th Percentile	50th Percentile	75th Percentile
Real Rate of Return	3.63%	4.95%	6.28%
Inflation	3.50%	3.50%	3.50%
Expenses	(0.22)%	(0.22)%	(0.22)%
Ultimate Investment Return	6.91%	8.23%	9.56%

There is a slightly more than 50% chance that the net return will be 7.50% or more over a 50-year period. A net return of 7.50% is at the 36th percentile. Although not in the center of the recommended range, in our opinion, a 7.50% return assumption is very conservative yet reasonable and we recommend no change in the investment return assumption.

Investment Return Assumption	
Current	7.50%
Reasonable Range	6.91% - 9.56%
Recommended	7.50%

Smoothed Interest Rate Methodology

Year Ending 6/30	Actuarial Value	Market Value
2006	4.38%	5.34%
2007	5.24	14.56
2008	2.65	(6.46)
2009	0.70	(14.64)
2010	0.47	13.44
Average	2.67%	1.80%

In addition to our recommendation for the Ultimate Investment Rate of Return, we are also recommending that KTRS adopt a Smoothed Interest Rate Methodology that will help reduce contribution volatility. The smoothed interest rate is the assumed rate of return during the 25 year look forward period beginning on the valuation date. This is the investment rate of return expected to be earned during this period based on the actual rates earned on a market value basis during the 5 year look back period shown above such that the average rate of return over the combined 30 year period is equivalent to the ultimate investment rate of return of 7.50%. On this basis, for the June 30, 2010 valuation, the smoothed interest rate during the 25 year look forward period has been determined to be 8.68%. However, the smoothed interest rate is limited to 0.50% around the ultimate investment rate of 7.50%, therefore, the smoothed interest rate can never be greater than 8.00% or lower than 7.00%. Therefore, our assumption is that the smoothed interest rate for the 25 year look forward period is 8.00% and then the ultimate rate of return of 7.50% is the assumption for all periods beyond the 25 year look forward period.

Wage Inflation

Background: The assumed future increases in salaries consist of an inflation component and a component for promotion and longevity, often called merit increases. The latter are generally age and or service related, and will be dealt with in the demographic assumption section of the report. Wage inflation normally is above price inflation as a reflection of the overall return on labor in the economy.

The current wage inflation assumption is 4.00%, or the same as price inflation.

Past Experience: The Social Security Administration publishes data on wage growth in the United States. Appendix C shows the last 50 calendar years' data. As with our analysis of inflation, we provide below wage inflation and a comparison with price inflation over various time periods. Since wage data is only available through 2009 we use that year as the starting point.

Period	Wage Inflation	Price Inflation	Real Wage Growth
2000-2009	2.94%	2.55%	0.39%
1990-1999	4.25	2.99	1.26
1980-1989	5.76	5.30	0.46
1970-1979	6.89	7.23	(0.34)
1960-1969	4.33	2.39	1.94
1990-2009	3.59	2.77	0.82
1980-2009	4.31	3.61	0.70
1970-2009	4.95	4.50	0.45
1960-2009	4.83	4.05	0.75

Thus over the last 50 years, annual real wage growth has averaged 0.75%.

Annual Real Wage Growth
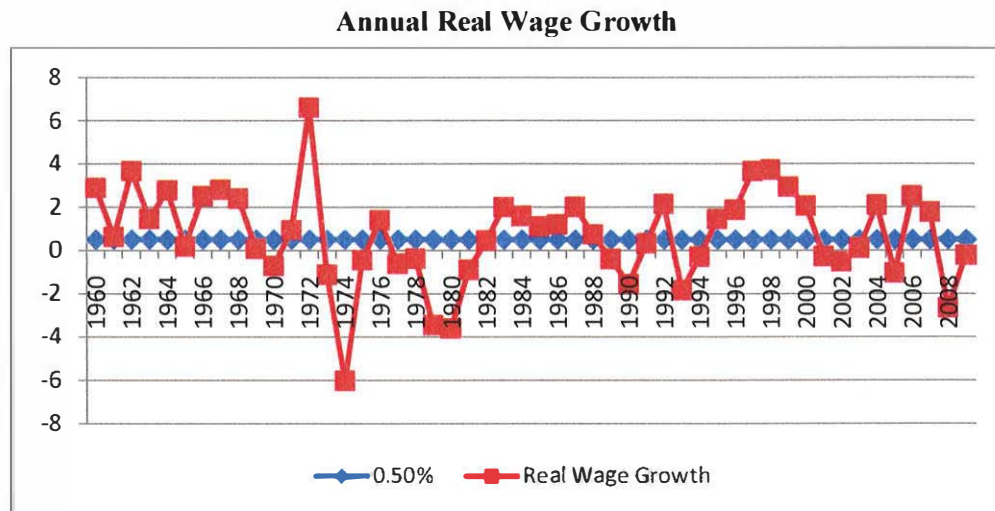
Recommendation: As with price inflation, we again look at the 2010 OASDI Trustees Report. The Chief Actuary for Social Security bases the 75 year cost projections on a national wage growth assumption 1.2% greater than the price inflation assumption of 2.8%. We concur in general with a range of .5% to 1.5%, and recommend use of a 0.50% per year rate at the current time.

Wage Inflation Assumption		
Current	4.00%	
	Reasonable Range	
Real Wage Growth	0.50%	1.50%
Inflation	3.50	3.50
Total	4.00%	5.00%
Recommended	4.00%	

Section III
Demographic Assumptions

There are several demographic assumptions used in the actuarial valuations performed for KTRS. They are:

- Rates of Withdrawal
- Pre-retirement Mortality
- Rates of Disability Retirement
- Rates of Service Retirement
- Post-retirement Mortality
- Rates of Salary Increase

The Actuarial Standards Board has issued Actuarial Standard of Practice (ASOP) No. 35, *"Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations"*, which provides guidance to actuaries in selecting demographic assumptions for measuring obligations under defined benefit plans. In our opinion, the demographic assumptions recommended in this report have been developed in accordance with ASOP No. 35.

The purpose of a study of demographic experience is to compare what actually happened to the membership during the study period (July 1, 2005, through June 30, 2010) with what was expected to happen based on the assumptions used in the most recent Actuarial Valuations.

Detailed tabulations by age, service and/or gender are performed over the entire study period. These tabulations look at all active and retired members during the period as well as separately annotating those who experience a demographic event, also referred to as a decrement. In addition the tabulation of all members together with the current assumptions permits the calculation of the number of expected decrements during the study period.

If the actual experience differs significantly from the overall expected results, or if the pattern of actual decrements, or rates of decrement, by age, gender, or service does not follow the expected pattern, new assumptions are recommended. Recommended changes usually do not follow the exact actual experience during the observation period. Judgment is required to extrapolate future experience from past trends and current member behavior. In addition non-recurring events, such as early retirement windows, need to be taken into account in determining the weight to give to recent experience.

The remainder of this section presents the results of the demographic study. We have prepared tables that show a comparison of the actual and expected decrements and the overall ratio of actual to expected results (A/E Ratios) under the current assumptions. If a change is being proposed, the revised A/E Ratios are shown as well. Salary adjustments, other than the economic assumption for wage inflation discussed in the previous section, are treated as demographic assumptions.

RATES OF WITHDRAWAL

COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS
FROM ACTIVE SERVICE

CENTRAL AGE OF GROUP	NUMBER OF WITHDRAWALS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
Withdrawals with less than 5 years of service						
20	6	2.2	2.727	8	6.5	1.231
25	361	350.6	1.030	1,314	1,317.4	0.997
30	299	296.0	1.010	845	812.4	1.040
35	226	200.4	1.128	483	428.2	1.128
40	153	144.3	1.060	331	324.9	1.019
45	137	110.2	1.243	257	211.1	1.217
50	76	84.6	0.898	212	169.8	1.249
53 & OVER	163	136.0	1.199	220	166.1	1.325
TOTAL	1,421	1,324.3	1.073	3,670	3,436.4	1.068
Withdrawals with at least 5 but less than 10 years of service						
25	20	6.5	3.078	112	69.4	1.614
30	170	159.7	1.064	807	707.1	1.141
35	144	132.9	1.084	443	445.6	0.994
40	86	73.1	1.176	214	171.1	1.251
45	77	37.8	2.037	191	117.8	1.621
50	55	53.2	1.034	162	116.9	1.386
53 & OVER	33	16.9	1.953	96	54.0	1.778
TOTAL	585	480.1	1.218	2,025	1,681.9	1.204
Withdrawals with 10 or more years of service						
30	3	3.1	0.968	10	8.3	1.205
35	82	65.6	1.250	246	285.1	0.863
40	83	95.2	0.872	263	299.9	0.877
45	80	115.6	0.692	205	328.0	0.625
50	79	175.7	0.450	244	433.0	0.564
53 & OVER	41	57.1	0.718	110	159.0	0.692
TOTAL	368	512.3	0.718	1,078	1,513.3	0.712

The following graphs show a comparison of the present, actual, and proposed rates of withdrawal for each of the service categories.

RATES OF WITHDRAWAL FOR ACTIVE MEMBERS
WITH LESS THAN 5 YEARS OF SERVICE
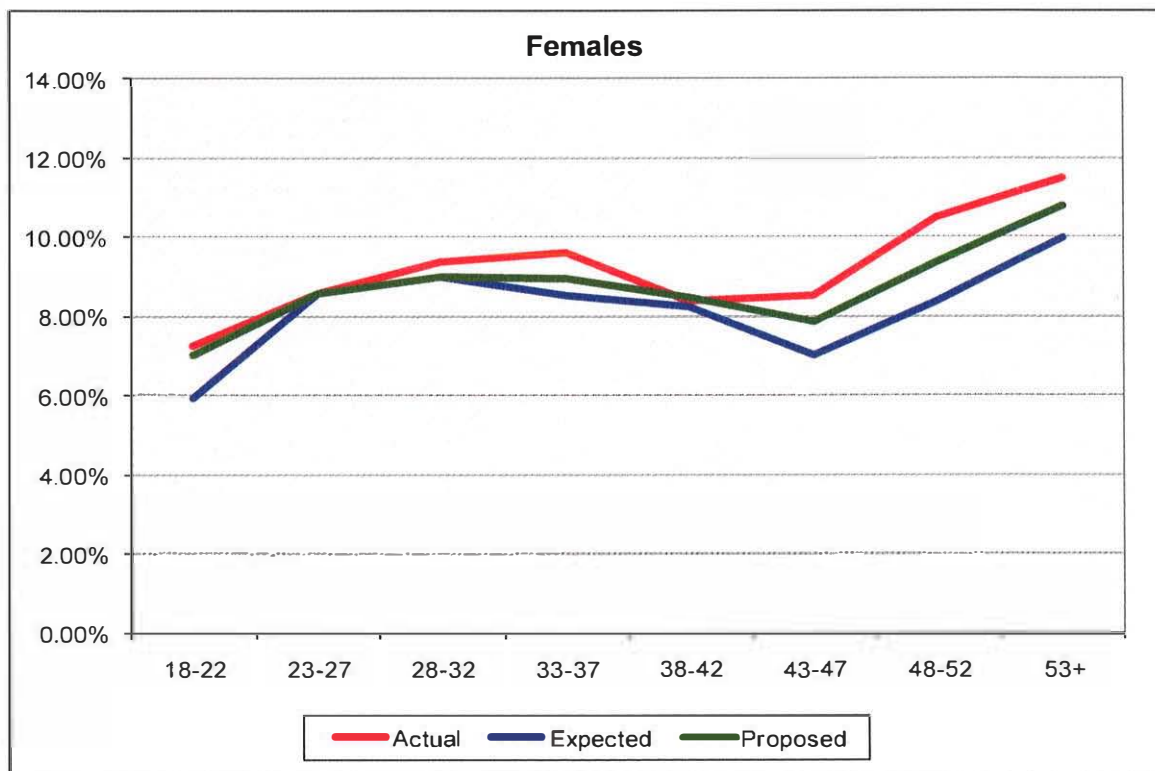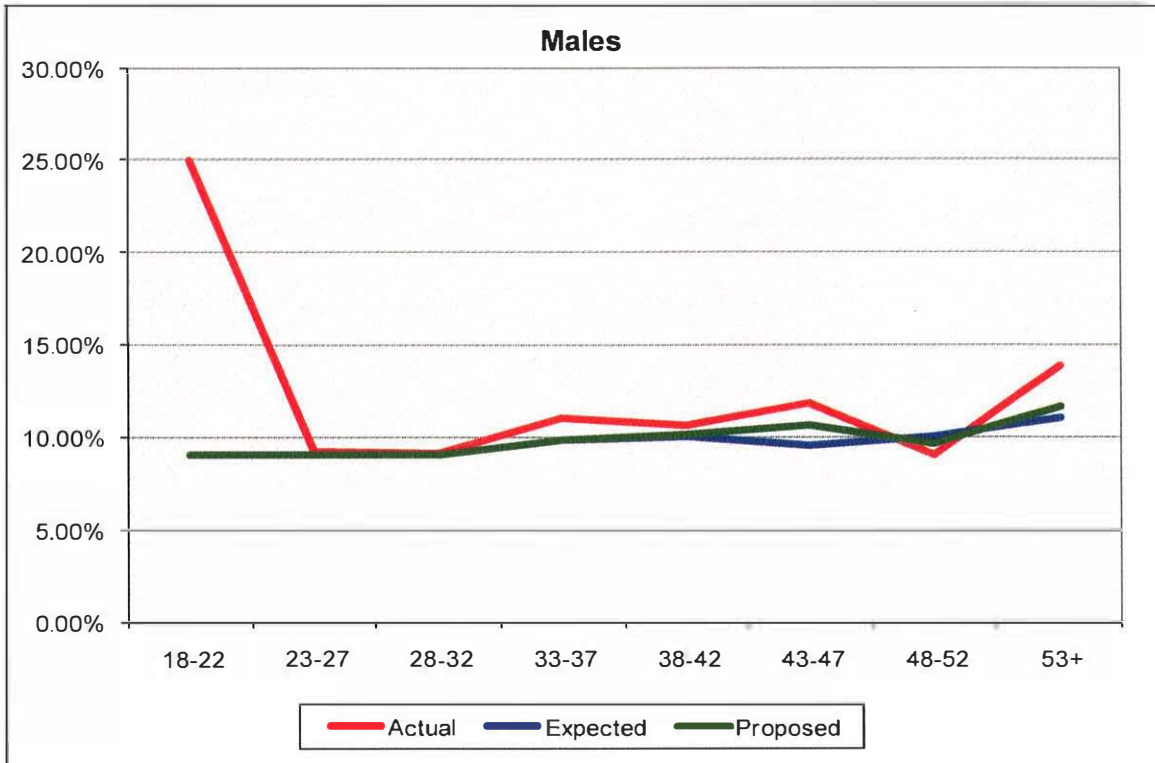
RATES OF WITHDRAWAL FOR ACTIVE MEMBERS
WITH AT LEAST 5 BUT LESS THAN 10 YEARS OF SERVICE
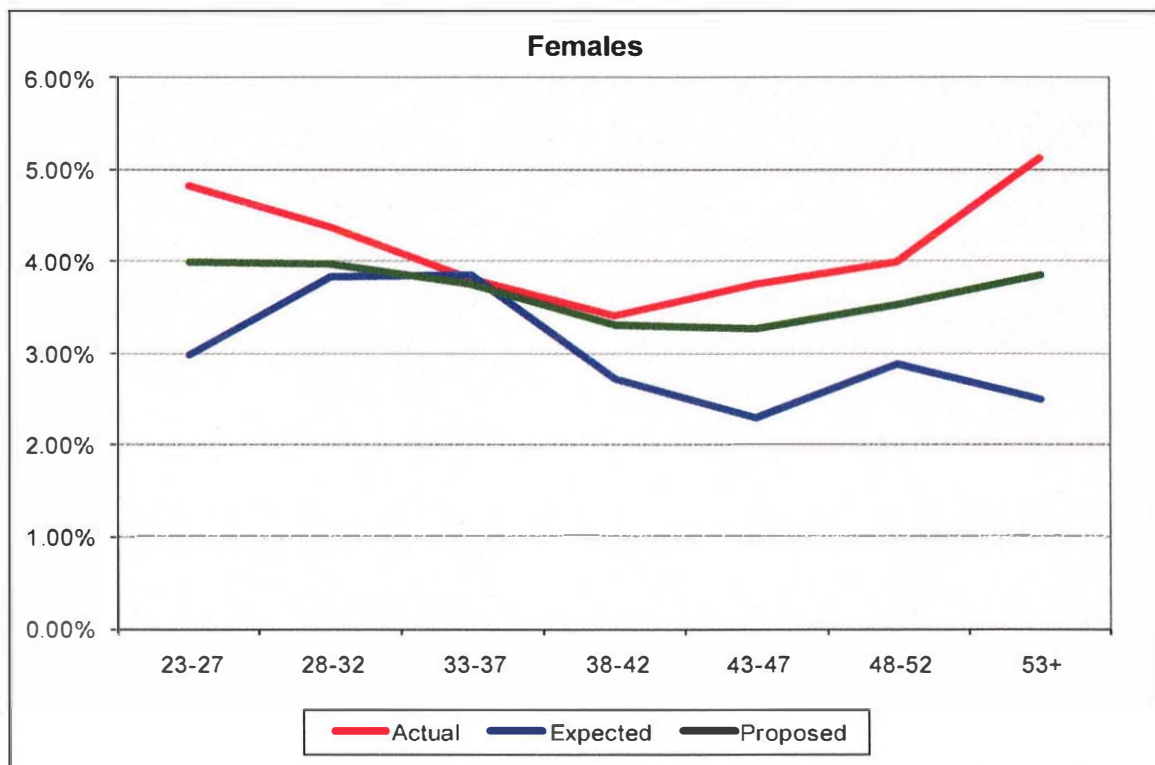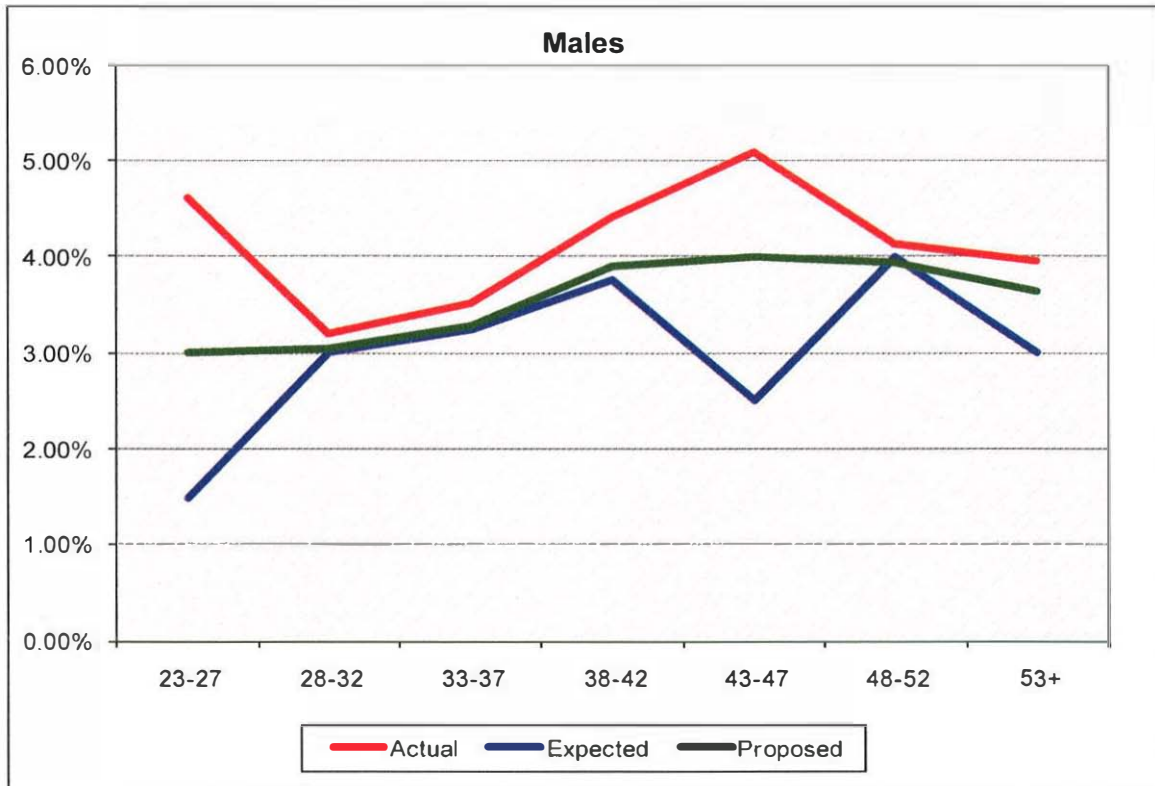
RATES OF WITHDRAWAL FOR ACTIVE MEMBERS
WITH 10 OR MORE YEARS OF SERVICE

Males
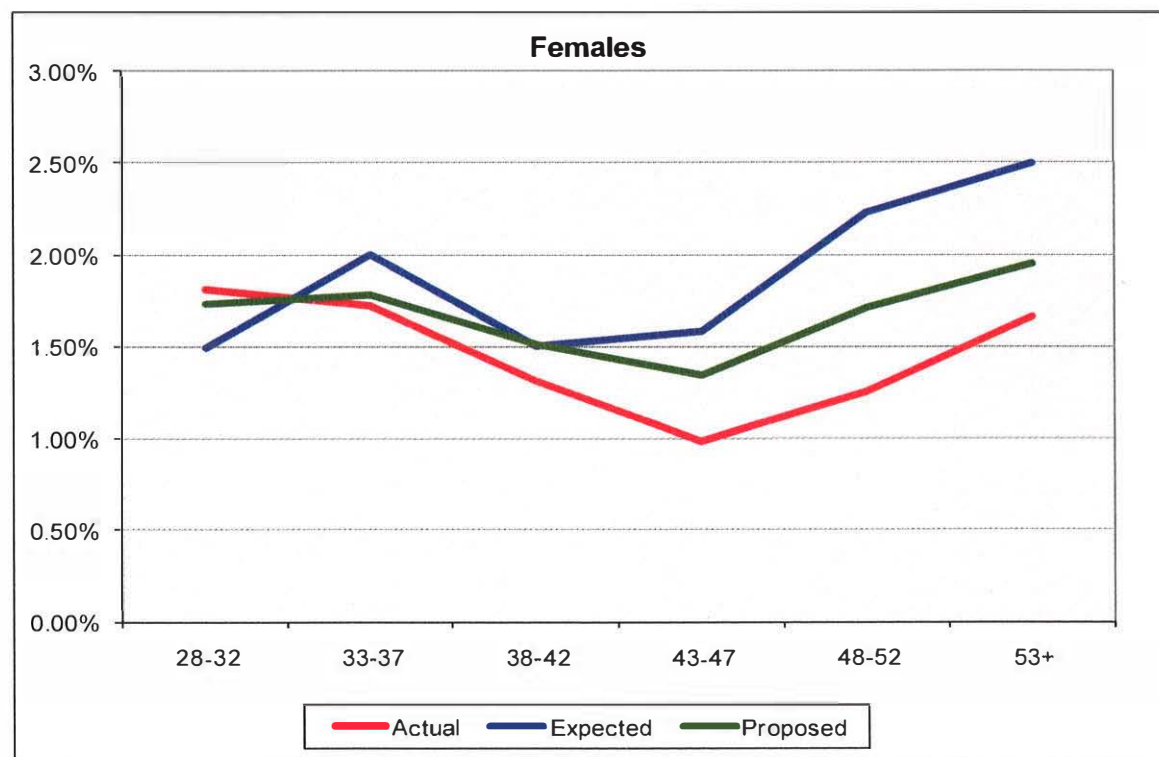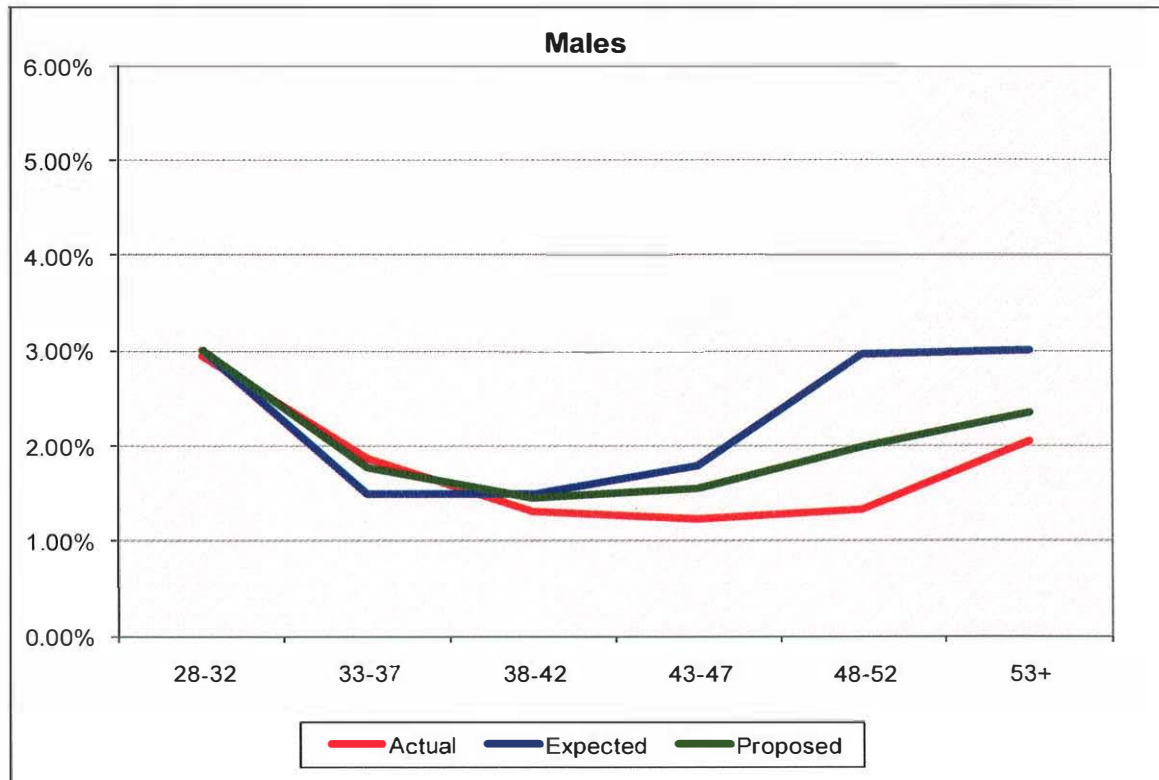
Females

The rates of withdrawal adopted by the Board are used to determine the expected number of separations from active service which will occur as a result of resignation or dismissal. The preceding results indicate that for male and female members with less than 10 years of service, the actual number who withdrew was slightly greater than expected at almost all ages. The results also show that for male and female members with greater than 10 years of service, the actual number who withdrew is lower than expected at most ages. We recommend that the rates of withdrawal be revised at this time to more closely reflect the experience of the System.

The following table shows a comparison between the present withdrawal rates and the proposed rates.

COMPARATIVE RATES OF WITHDRAWAL
FROM ACTIVE SERVICE

AGE	RATES OF WITHDRAWAL					
	PRESENT			PROPOSED		
	Years of Service			Years of Service		
	0 – 4	5 – 9	10+	0 – 4	5 – 9	10+
Males						
20	9.00%			9.00%		
25	9.00	1.50%		9.00	3.00%	
30	9.00	3.00	3.00%	9.00	3.00	3.00%
35	10.00	3.25	1.50	10.00	3.25	1.75
40	10.00	3.75	1.50	10.00	4.00	1.40
45	9.50	2.50	1.50	11.00	4.00	1.50
50	10.00	4.00	3.00	9.00	4.00	2.00
55	11.00	3.00	2.70	12.00	3.50	2.50
Females						
20	6.00%			7.00%		
25	8.50	3.00%		8.50	4.00%	
30	9.00	4.00	1.50%	9.00	4.00	1.65%
35	8.50	4.00	2.00	9.00	3.75	1.85
40	8.50	2.50	1.50	8.50	3.25	1.50
45	7.00	2.50	1.50	7.50	3.25	1.25
50	8.50	3.00	2.25	9.50	3.50	1.75
55	10.00	3.50	2.50	11.00	4.00	2.00

The following table shows a comparison of the actual and expected withdrawals from active service based on the new proposed rates of withdrawal.

COMPARISON OF ACTUAL AND EXPECTED WITHDRAWALS
FROM ACTIVE SERVICE BASED ON PROPOSED RATES OF WITHDRAWAL

CENTRAL AGE GROUP	NUMBER OF WITHDRAWALS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
Withdrawals with less than 5 years of service						
20	6	2.2	2.727	8	7.7	1.039
25	361	350.6	1.030	1,314	1,317.4	0.997
30	299	296.0	1.010	845	812.4	1.040
35	226	200.4	1.128	483	450.6	1.072
40	153	145.9	1.049	331	334.1	0.991
45	137	123.5	1.109	257	236.4	1.087
50	76	81.1	0.937	212	189.5	1.119
53 & OVER	163	145.7	1.119	220	174.3	1.262
TOTAL	1,421	1,345.4	1.056	3,670	3,522.4	1.042
Withdrawals with at least 5 but less than 10 years of service						
25	20	13.0	1.538	112	92.7	1.208
30	170	161.7	1.051	807	732.4	1.102
35	144	134.1	1.074	443	433.8	1.021
40	86	75.9	1.133	214	208.3	1.027
45	77	60.4	1.275	191	167.2	1.142
50	55	52.3	1.052	162	142.5	1.137
53 & OVER	33	20.7	1.594	96	59.5	1.613
TOTAL	585	518.1	1.129	2,025	1,836.4	1.103
Withdrawals with 10 or more years of service						
30	3	2.6	1.154	10	9.5	1.053
35	82	77.8	1.054	246	253.8	0.969
40	83	92.3	0.899	263	302.5	0.869
45	80	100.5	0.796	205	278.5	0.736
50	79	118.1	0.669	244	331.4	0.736
53 & OVER	41	49.3	0.832	110	133.9	0.822
TOTAL	368	440.6	0.835	1,078	1,309.6	0.823

RATES OF PRE-RETIREMENT MORTALITY

COMPARISON OF ACTUAL AND EXPECTED PRE-RETIREMENT DEATHS

CENTRAL AGE OF GROUP	NUMBER OF DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
25	1	0.4	2.500	3	1.3	2.308
30	3	1.5	2.000	6	4.1	1.463
35	4	3.4	1.176	5	8.1	0.617
40	5	4.6	1.087	7	13.3	0.526
45	4	6.0	0.667	12	16.2	0.741
50	16	10.2	1.569	19	20.8	0.913
53 & OVER	41	49.2	0.833	56	43.0	1.302
TOTAL	74	75.3	0.983	108	106.8	1.011

The experience overall indicates that the current pre-retirement mortality rates were very close to the actual results over this 5-year period. However, we recommend that KTRS adopt a prescribed mortality table for pre-retirement deaths. In the post-retirement mortality, we are recommending a change to the RP 2000 Combined Mortality Table projected to 2020 using scale AA set back 1 year for females. Therefore, we recommend that the pre-retirement mortality be based on 50% of this table. The expected number of deaths is fairly similar to the numbers in the chart above.

RATES OF DISABILITY RETIREMENT

COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS

CENTRAL AGE OF GROUP	NUMBER OF DISABILITY RETIREMENTS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
25	0	0.4	0.000	1	5.3	0.189
30	1	1.6	0.625	12	13.4	0.896
35	5	4.9	1.020	23	35.1	0.655
40	10	8.5	1.176	36	67.8	0.531
45	13	20.3	0.640	85	106.1	0.801
50	25	38.7	0.646	91	136.8	0.665
53 & OVER	91	107.6	0.846	289	275.2	1.050
TOTAL	145	182.0	0.797	537	639.7	0.839

The following graphs show a comparison of the present, actual, and proposed rates of disability retirement.

RATES OF DISABILITY RETIREMENT

Males

| Actual | Expected | Proposed |

Females

| Actual | Expected | Proposed |
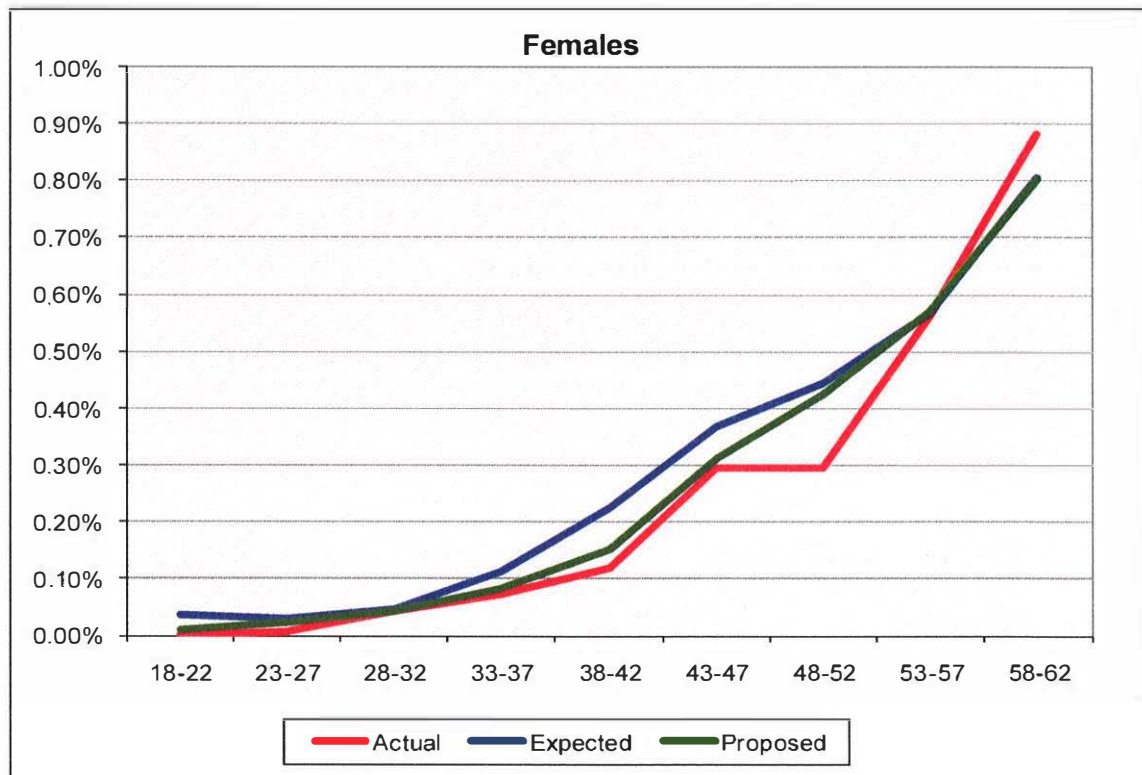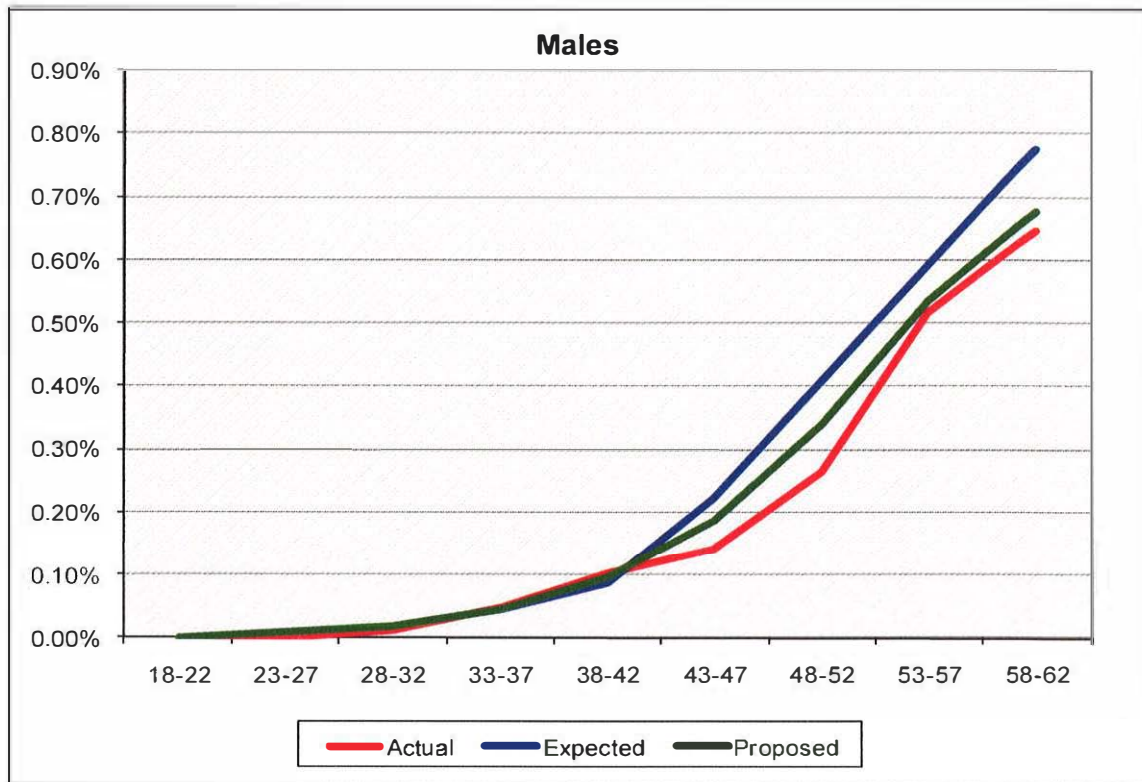
The preceding results indicate that the actual number of disability retirements was less than expected at most ages. We recommend that the rates of disability retirements be revised to more closely reflect the actual experience of the membership.

The following table shows a comparison between the present and proposed rates of disability retirements.

COMPARATIVE RATES OF DISABILITY RETIREMENTS

| AGE | RATES OF DISABILITY | | | |
| | MALES | | FEMALES | |
	Present	Proposed	Present	Proposed
20	0.01%	0.01%	0.03%	0.01%
25	0.01	0.01	0.03	0.02
30	0.02	0.02	0.04	0.04
35	0.05	0.05	0.11	0.08
40	0.08	0.09	0.22	0.14
45	0.22	0.18	0.38	0.32
50	0.42	0.33	0.44	0.42
55	0.60	0.55	0.56	0.56
60	0.79	0.70	0.85	0.85

The following table shows a comparison of the actual and expected disability retirements based on new proposed rates of disability.

COMPARISON OF ACTUAL AND EXPECTED DISABILITY RETIREMENTS
BASED ON PROPOSED RATES OF DISABILITY

| CENTRAL AGE OF GROUP | NUMBER OF DISABILITY RETIREMENTS | | | | | |
| | MALES | | | FEMALES | | |
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
25	0	0.5	0.000	1	4.0	0.250
30	1	1.6	0.625	12	11.9	1.008
35	5	4.9	1.020	23	25.6	0.898
40	10	9.3	1.075	36	46.2	0.779
45	13	17.1	0.760	85	89.9	0.945
50	25	32.1	0.779	91	130.9	0.695
53 & OVER	91	94.8	0.960	289	275.6	1.049
TOTAL	145	160.3	0.905	537	584.1	0.919

RATES OF RETIREMENT

COMPARISON OF ACTUAL AND EXPECTED RETIREMENTS

UNDER 27 YEARS OF SERVICE

| CENTRAL AGE OF GROUP | NUMBER OF RETIREMENTS | | | | | |
| | MALES | | | FEMALES | | |
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
55	48	62.2	0.772	173	231.9	0.746
56	51	56.6	0.901	131	205.8	0.637
57	36	51.5	0.699	122	184.4	0.662
58	36	48.1	0.748	111	164.0	0.677
59	36	41.5	0.867	110	139.4	0.789
60	71	86.4	0.822	178	250.4	0.711
61	79	69.4	1.138	152	168.5	0.902
62	58	53.2	1.090	98	99.3	0.987
63	37	32.9	1.125	80	103.1	0.776
64	30	39.1	0.767	73	73.4	0.995
65	37	40.9	0.905	58	75.4	0.769
66	31	33.8	0.917	41	49.2	0.833
67	17	15.8	1.076	16	23.1	0.693
68	11	14.2	0.775	13	12.3	1.057
69	10	11.3	0.885	11	15.0	0.733
SUBTOTAL	588	656.9	0.895	1,367	1,795.2	0.761
70 & Over	20	114.1	0.175	23	148.5	0.155
TOTAL	608	771.0	0.789	1,390	1,943.7	0.715

27 OR MORE YEARS OF SERVICE

CENTRAL AGE OF GROUP	NUMBER OF RETIREMENTS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
52 & UNDER	221	244.9	0.902	732	1,034.8	0.707
53	52	84.2	0.618	160	273.7	0.585
54	72	83.1	0.866	257	288.5	0.891
55	303	286.3	1.058	907	903.5	1.004
56	151	176.9	0.854	512	644.9	0.794
57	143	132.7	1.078	309	504.9	0.612
58	90	110.1	0.817	269	467.3	0.576
59	77	96.8	0.795	233	377.4	0.617
60	70	78.7	0.889	233	261.4	0.891
61	47	73.1	0.643	184	195.4	0.942
62	59	52.6	1.123	118	125.3	0.942
63	33	51.9	0.636	90	84.2	1.069
64	24	46.1	0.521	75	76.6	0.979
65	30	49.0	0.612	51	51.6	0.988
66	32	24.4	1.311	30	35.5	0.845
67	17	17.4	0.977	21	29.6	0.709
68	9	16.1	0.559	16	20.7	0.773
69	9	8.8	1.023	12	14.9	0.805
SUBTOTAL	1,439	1,633.1	0.881	4,209	5,390.2	0.781
70 & Over	22	108.7	0.202	30	136.3	0.220
TOTAL	1,461	1,741.8	0.839	4,239	5,526.5	0.767

The following graphs show a comparison of the present, actual, and proposed rates of service retirements.

RATES OF RETIREMENT

Male Retirements Under 27 Years

Female Retirements Under 27 Years

RATES OF RETIREMENT

Male Retirements 27 Years and Over

Male Retirements 27 Years and Over
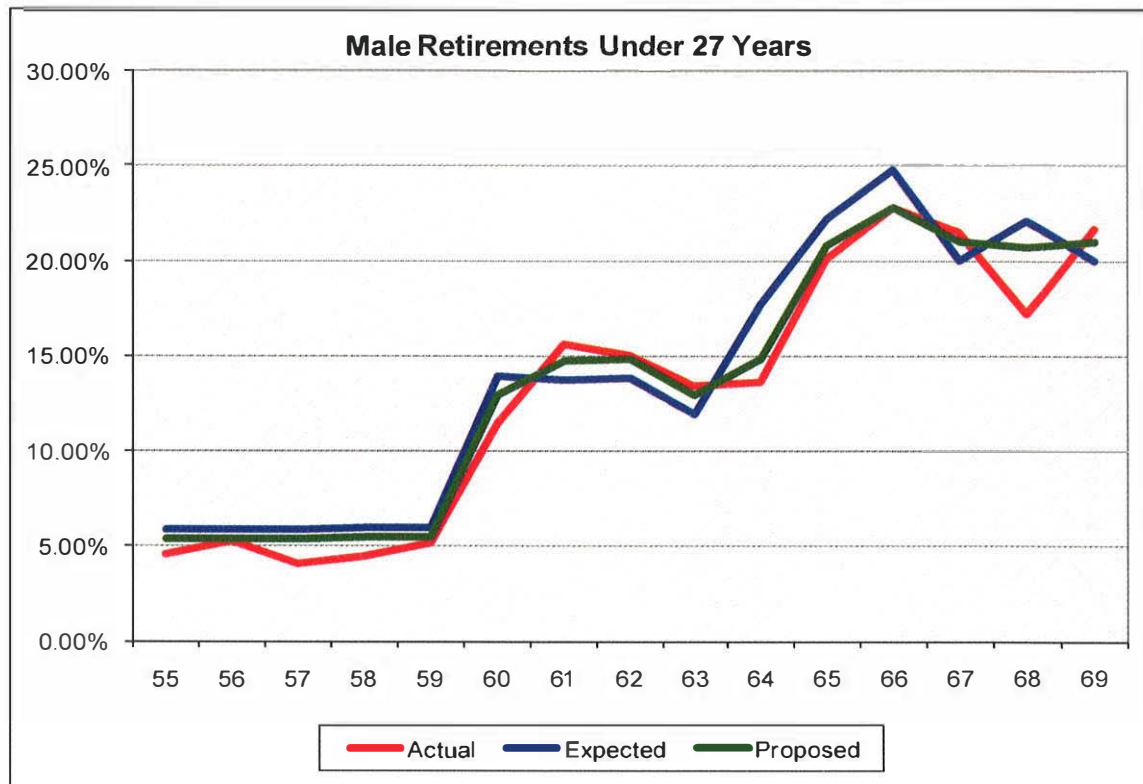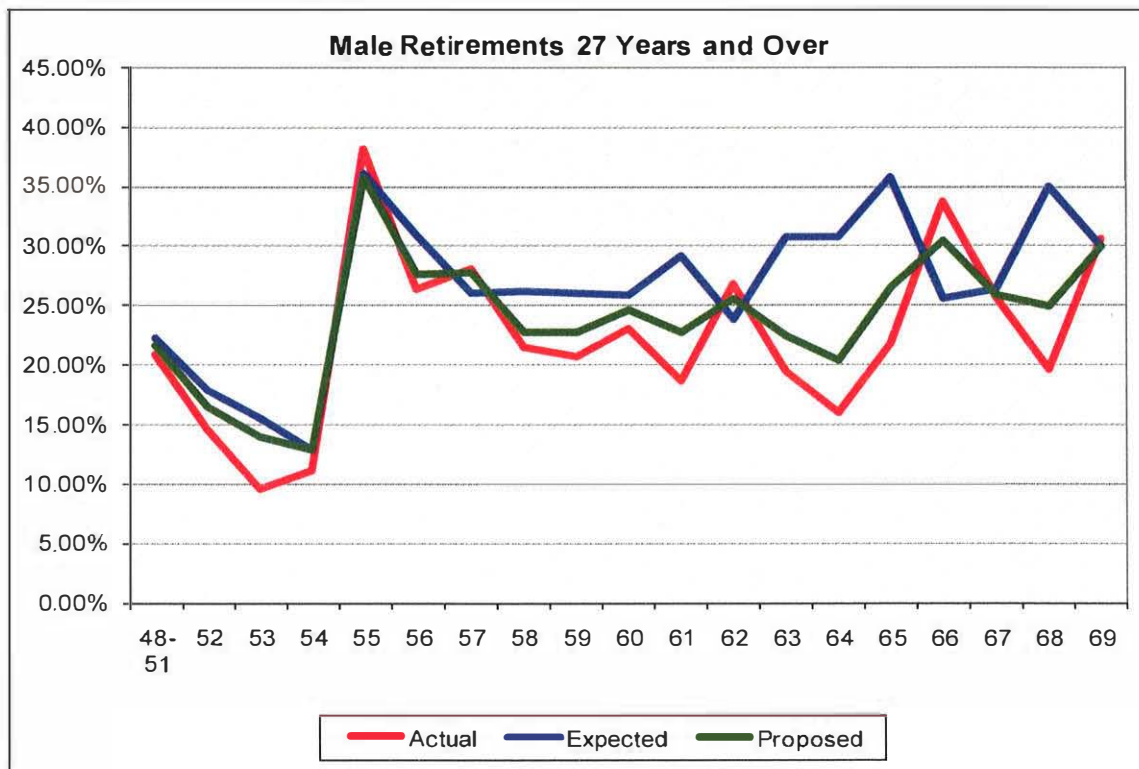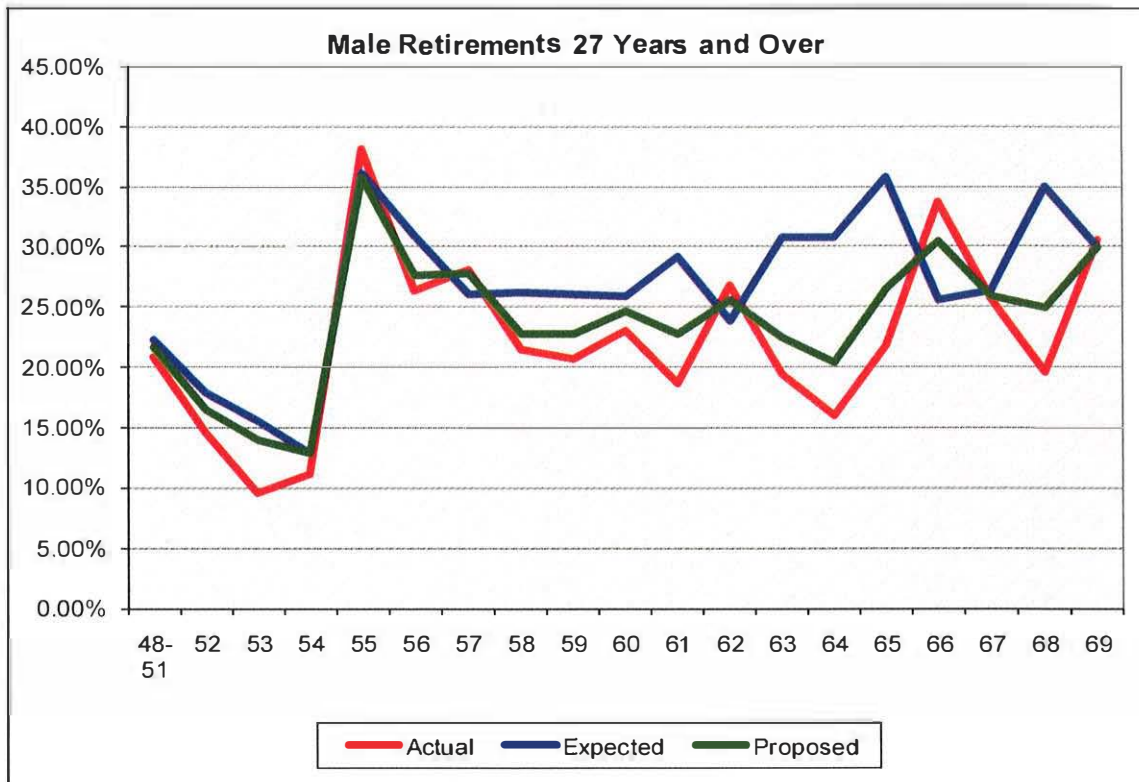
The preceding results indicates that the actual rates of retirement for retirements under 27 years of service for both males and females were less than expected at most ages. For retirements with 27 or more years of service, the actual rates of retirement overall were also less than expected. On the basis of this experience, we recommend that the rates of retirement be revised to reflect actual experience more closely. The following table shows a comparison of the present and proposed rates of service retirement.

COMPARATIVE RATES OF RETIREMENT

| AGE | RATES OF RETIREMENT | | | | | | | |
| | MALES | | | | FEMALES | | | |
	Present Under 27 Years of Service	Present* 27 Years of Service and More	Proposed Under 27 Years of Service	Proposed** 27 Years of Service and More	Present Under 27 Years of Service	Present* 27 Years of Service and More	Proposed Under 27 Years of Service	Proposed** 27 Years of Service and More
48	0.0%	22.0%	0.0%	17.0%	0.0%	22.0%	0.0%	15.0%
49	0.0	23.0	0.0	17.0	0.0	21.0	0.0	15.0
50	0.0	20.0	0.0	17.0	0.0	20.0	0.0	15.0
51	0.0	19.0	0.0	17.0	0.0	19.0	0.0	15.0
52	0.0	17.0	0.0	15.0	0.0	18.0	0.0	15.0
53	0.0	15.0	0.0	13.0	0.0	15.0	0.0	12.0
54	0.0	12.5	0.0	12.0	0.0	15.0	0.0	15.0
55	6.0	35.0	5.5	35.0	7.5	35.0	6.0	35.0
56	6.0	30.0	5.5	27.0	7.5	35.0	6.0	32.0
57	6.0	25.0	5.5	27.0	7.5	35.0	6.0	25.0
58	6.0	25.0	5.5	22.0	7.5	35.0	6.0	23.0
59	6.0	25.0	5.5	22.0	7.5	35.0	6.0	25.0
60	14.0	25.0	13.0	24.0	16.5	30.0	14.0	30.0
61	14.0	28.0	15.0	22.0	15.0	30.0	14.0	30.0
62	14.0	23.0	15.0	25.0	12.5	25.0	12.5	25.0
63	12.0	30.0	13.0	22.0	18.0	25.0	15.0	25.0
64	18.0	30.0	15.0	20.0	18.0	30.0	18.0	30.0
65	22.5	35.0	21.0	26.0	26.0	30.0	22.0	30.0
66	25.0	25.0	23.0	30.0	24.5	30.0	22.0	28.0
67	20.0	25.0	21.0	25.0	17.5	30.0	16.0	25.0
68	22.5	35.0	21.0	25.0	15.0	30.0	16.0	25.0
69	20.0	30.0	21.0	30.0	25.0	30.0	16.0	25.0
70	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*Plus 5% before age 55 for all and 15% for males and 20% for females after age 55 in year when first eligible for unreduced retirement with 27 years of service.
**Plus 10% in year when first eligible for unreduced retirement with 27 years of service.

The following table shows a comparison of actual and expected service retirements based on new proposed rates of retirement.

COMPARISON OF ACTUAL AND EXPECTED RETIREMENTS
BASED ON PROPOSED RETIREMENT RATES

UNDER 27 YEARS OF SERVICE

| CENTRAL AGE OF GROUP | NUMBER OF RETIREMENTS | | | | | |
| | MALES | | | FEMALES | | |
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
55	48	57.1	0.841	173	185.5	0.933
56	51	51.9	0.983	131	164.6	0.796
57	36	47.2	0.763	122	147.5	0.827
58	36	44.1	0.816	111	131.2	0.846
59	36	38.1	0.945	110	111.5	0.987
60	71	80.2	0.885	178	212.5	0.838
61	79	74.4	1.062	152	157.2	0.967
62	58	57.0	1.018	98	99.3	0.987
63	37	35.6	1.039	80	86.0	0.930
64	30	32.6	0.920	73	73.4	0.995
65	37	38.2	0.969	58	63.8	0.909
66	31	31.1	0.997	41	44.2	0.928
67	17	16.6	1.024	16	21.1	0.758
68	11	13.2	0.833	13	13.1	0.992
69	10	11.8	0.847	11	9.8	1.122
SUBTOTAL	588	629.1	0.935	1,367	1,520.7	0.899
70 & Over	20	114.1	0.175	23	148.5	0.155
TOTAL	608	743.2	0.818	1,390	1,669.2	0.833

27 YEARS OF SERVICE AND MORE

CENTRAL AGE OF GROUP	NUMBER OF RETIREMENTS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
52 & UNDER	221	233.7	0.946	732	893.3	0.819
53	52	75.4	0.690	160	226.3	0.707
54	72	82.6	0.872	257	293.0	0.877
55	303	283.4	1.069	907	891.2	1.018
56	151	157.9	0.956	512	581.5	0.880
57	143	141.0	1.014	309	357.1	0.865
58	90	95.8	0.939	269	304.2	0.884
59	77	84.3	0.913	233	267.3	0.872
60	70	74.8	0.936	233	256.4	0.909
61	47	57.1	0.823	184	191.0	0.963
62	59	56.3	1.048	118	121.9	0.968
63	33	38.0	0.868	90	82.6	1.090
64	24	30.7	0.782	75	74.9	1.001
65	30	36.3	0.826	51	51.0	1.000
66	32	28.9	1.107	30	32.4	0.926
67	17	17.1	0.994	21	24.0	0.875
68	9	11.5	0.783	16	17.0	0.941
69	9	8.8	1.023	12	12.0	1.000
SUBTOTAL	1,439	1,513.6	0.951	4,209	4,677.1	0.900
70 & OVER	22	108.7	0.202	30	136.3	0.220
TOTAL	1,461	1,622.3	0.901	4,239	4,813.4	0.881

RATES OF POST-RETIREMENT MORTALITY

COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
SERVICE RETIREMENTS						
57 & UNDER	31	28.9	1.073	55	39.9	1.378
60	81	112.2	0.722	86	131.0	0.656
65	116	187.7	0.618	130	198.9	0.654
70	162	231.6	0.699	146	228.8	0.638
75	202	269.1	0.751	271	291.9	0.928
80	261	270.3	0.966	399	424.2	0.941
85	248	236.8	1.047	517	521.0	0.992
90	152	147.5	1.031	616	557.9	1.104
93 & OVER	101	86.9	1.162	664	593.5	1.119
TOTAL	1,354	1,571.0	0.862	2,884	2,987.1	0.965
DISABILITY RETIREMENTS						
52 & UNDER	21	26.4	0.795	93	134.9	0.689
55	10	43.9	0.228	53	168.4	0.315
60	15	52.9	0.284	40	162.7	0.246
65	17	53.6	0.317	31	106.0	0.292
70	11	21.8	0.505	18	28.7	0.627
75	12	12.8	0.938	22	25.0	0.880
80	9	8.3	1.084	20	21.8	0.917
85	6	6.7	0.896	13	15.4	0.844
90	3	2.6	1.154	27	23.0	1.174
93 & OVER	2	3.5	0.571	4	7.1	0.563
TOTAL	106	232.5	0.456	321	693.0	0.463

The following graphs show a comparison of the present, actual and proposed rates of post-retirement deaths.

POST-RETIREMENT DEATHS
SERVICE RETIREMENTS

Mortality of Male Retirements

Mortality of Female Retirements
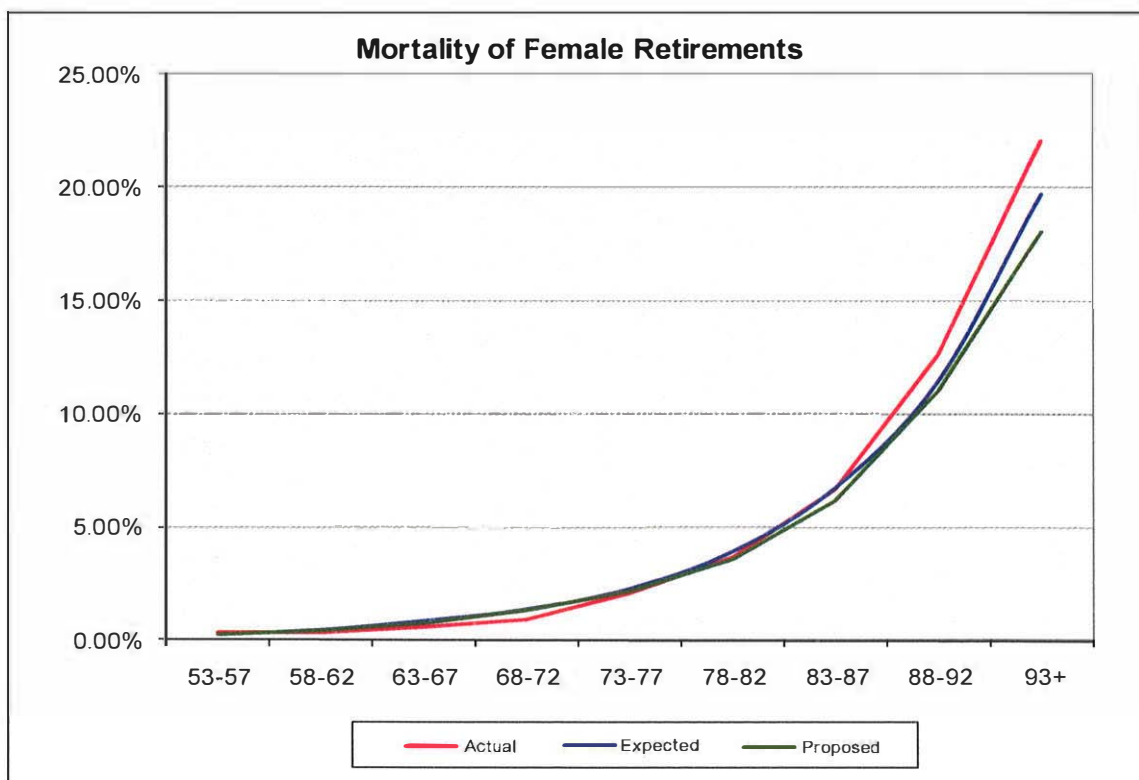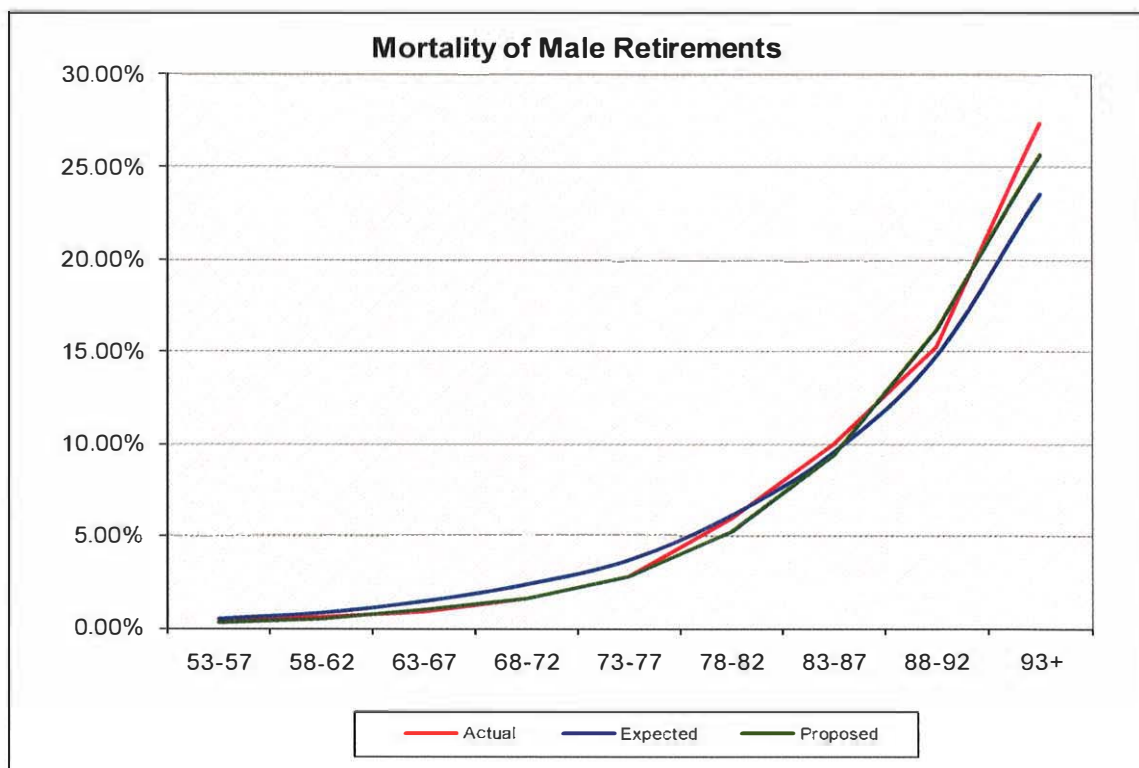
POST-RETIREMENT DEATHS
DISABILITY RETIREMENTS

Mortality of Male Disabled Retirements

Legend: Actual, Expected, Proposed

X-axis: 48-52, 53-57, 58-62, 63-67, 68-72, 73-77, 78-82, 83-87, 88-92, 93+

Mortality of Female Disabled Retirements

Legend: Actual, Expected, Proposed

X-axis: 48-52, 53-57, 58-62, 63-67, 68-72, 73-77, 78-82, 83-87, 88-92, 93+
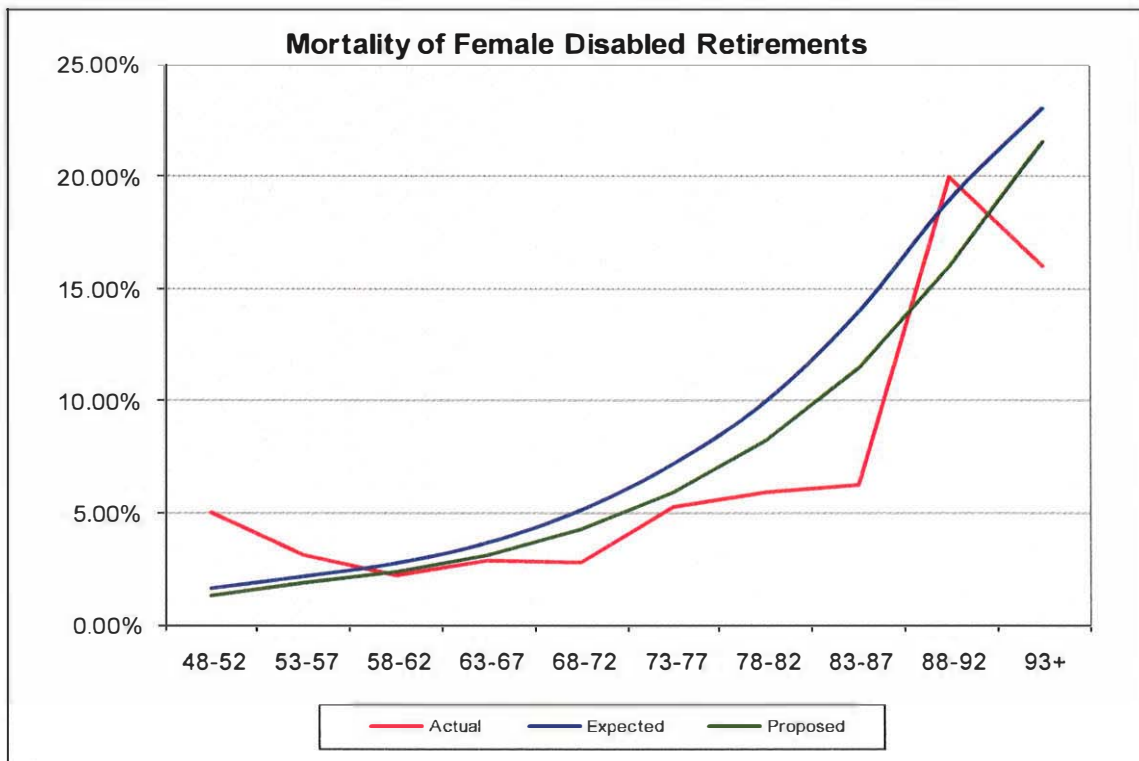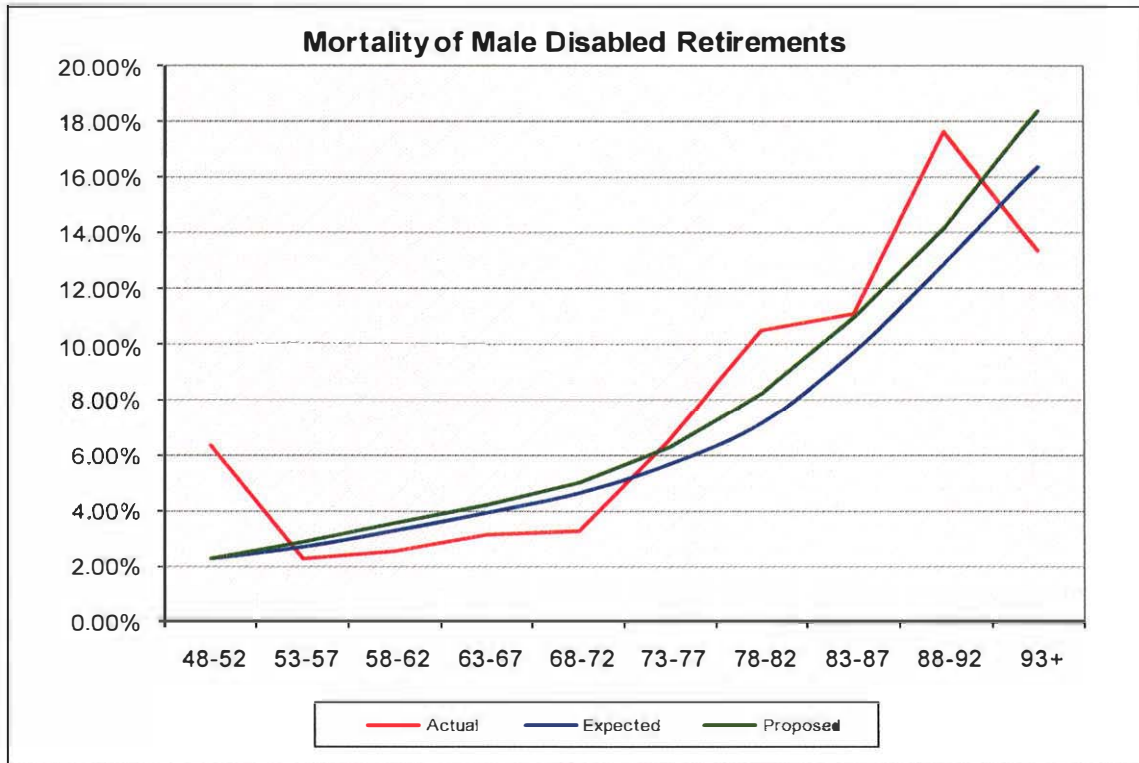
The preceding results indicate that the actual number of post-retirement deaths for both males and females was less than expected at some ages while more than expected at other ages. For disability retirement, the actual mortality rates were much less than expected at most ages. We recommend that the rates of mortality be revised to the RP 2000 Combined Mortality Table projected to 2020 using Scale AA set back 1 year for females for service retirements and dependents of deceased pensioners. For the period after disability retirement, we recommend that the rates of mortality be revised to the RP 2000 Disabled Mortality Table set back 7 years for Males and set forward 5 years for females. Both of these assumptions recognize the expectations of continued improvement in longevity. The following table shows a comparison between the present and proposed rates of mortality.

COMPARATIVE RATES OF POST-RETIREMENT MORTALITY

AGE	SERVICE RETIREMENTS AND DEPENDENTS OF DECEASED MEMBERS			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
35	0.09%	0.07%	0.05%	0.03%
40	0.11	0.09	0.07	0.05
45	0.16	0.12	0.10	0.07
50	0.26	0.15	0.14	0.11
55	0.44	0.25	0.23	0.21
60	0.80	0.49	0.44	0.40
65	1.45	0.96	0.86	0.78
70	2.37	1.64	1.37	1.34
75	3.72	2.85	2.27	2.17
80	6.20	5.26	3.94	3.61
85	9.72	9.62	6.77	6.16
90	15.29	16.93	11.63	11.22

AGE	DISABILITY RETIREMENTS			
	MALES		FEMALES	
	Present	Proposed	Present	Proposed
35	6.50%	2.26%	6.50%	0.75%
40	6.50	2.26	6.50	0.75
45	6.50	2.26	6.50	1.15
50	10.00	2.26	10.00	1.65
55	10.00	2.64	10.00	2.18
60	9.00	3.29	9.00	2.80
65	10.00	3.93	10.00	3.76
70	6.50	4.66	4.50	5.22
75	7.00	5.69	6.00	7.23
80	10.00	7.33	6.50	10.02
85	12.50	9.76	7.50	14.00
90	15.00	12.83	17.50	19.45

The following shows a comparison of the actual and expected post-retirement deaths based on new revised rates of mortality.

COMPARISON OF ACTUAL AND EXPECTED CASES OF
POST-RETIREMENT DEATHS
BASED ON REVISED MORTALITY RATES

CENTRAL AGE OF GROUP	NUMBER OF POST-RETIREMENT DEATHS					
	MALES			FEMALES		
	Actual	Expected	Ratio of Actual to Expected	Actual	Expected	Ratio of Actual to Expected
SERVICE RETIREMENTS						
57 & UNDER	31	16.7	1.856	55	36.9	1.491
60	81	69.8	1.160	86	119.1	0.722
65	116	125.8	0.922	130	180.6	0.720
70	162	160.7	1.008	146	222.5	0.656
75	202	204.5	0.988	271	280.2	0.967
80	261	231.4	1.128	399	388.1	1.028
85	248	232.7	1.066	517	476.9	1.084
90	152	161.2	0.943	616	535.7	1.150
93 & OVER	101	94.8	1.065	664	544.1	1.220
TOTAL	1,354	1,297.6	1.043	2,884	2,784.1	1.036
DISABILITY RETIREMENTS						
52 & UNDER	21	6.9	3.043	93	22.3	4.170
55	10	11.8	0.847	53	37.3	1.421
60	15	19.2	0.781	40	50.6	0.791
65	17	21.0	0.810	31	39.5	0.785
70	11	15.5	0.710	18	33.0	0.545
75	12	10.4	1.154	22	30.1	0.731
80	9	6.2	1.452	20	33.5	0.597
85	6	5.2	1.154	13	28.7	0.543
90	3	2.2	1.364	27	25.6	1.055
93 & OVER	2	2.5	0.800	4	5.8	0.690
TOTAL	106	100.9	1.051	321	306.4	1.048

RATES OF SALARY INCREASE

COMPARISON OF ACTUAL AND EXPECTED SALARIES
OF ACTIVE MEMBERS

CENTRAL AGE OF GROUP	SALARIES AT END OF YEAR ($1,000's)		
	MALES AND FEMALES		
	Actual	Expected	Ratio of Actual to Expected
25	$ 1,018,292	$ 1,013,798	1.004
30	1,573,471	1,574,287	0.999
35	2,018,950	2,011,365	1.004
40	2,034,174	2,034,179	1.000
45	2,098,734	2,103,206	0.998
50	2,282,098	2,286,162	0.998
55	1,827,619	1,813,390	1.008
60	759,999	754,260	1.008
63+	209,439	208,058	1.007
TOTAL	$13,822,776	$13,798,705	1.002

During the period under investigation, the actual rates of salary increase were slightly higher than expected for both males and females at most ages. However, we recommend no change in the salary scale at this time.

Section IV
Other Assumptions

AMORTIZATION METHOD: Currently, the unfunded accrued liability is amortized using the level percent of payroll amortization method. We recommend no change in this methodology.

ASSETS: Currently, the actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected market 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 market value. In addition, the actuarial value of assets cannot be less than 80% or more than 120% of the market value of assets. We recommend maintaining the current smoothing method.

ADMINISTRATIVE TOOLS: We recommend that any administrative tools utilized by the Retirement System be revised to be based on the mortality table and investment rate of return recommended for the valuation.

OPTION FACTORS: The option factors currently used by the Retirement System are based on the mortality tables and investment rate of return (discount rate) used in the valuation. We recommend that the factors be revised to be based on the mortality table recommended for the valuation.

VALUATION COST METHOD: Currently, the valuation uses Projected Unit Credit (PUC) Cost Method. We recommend a change to the Entry Age Normal (EAN) Cost Method. This is the most widely used cost method of large public sector plans and has demonstrated the highest degree of stability as compared to alternative methods.

PERCENT MARRIED: Currently, 100% of all members are assumed to be married with the male three years older than his spouse. This assumption is used to determine if anyone is entitled to a Survivor Benefit from a death in active service. The survivor benefits for members with 10 years of service before death can be paid to either spouses or dependent children or other dependents. An analysis of active members shows that 99% of all active members have listed either a spouse or a dependent beneficiary on file. Therefore, we recommend no change in this assumption at this time.

PART-TIMERS: Currently, we assume that all part time employees will accrue 0.25 years of service each year while in that status. After review of the data for the past 5 years, part-timers are averaging 0.24 years of service each year, therefore, we recommend no change in this assumption at this time.

UNUSED SICK LEAVE: Currently, we assume a load of 1.0% to all active liability for all unused sick leave added at retirement. KTRS staff has supplied us with average service credits due to unused sick leave for those active members that retired in the last 10 years that were not in Local School Districts. The average unused sick leave credit for these individuals was approximately 0.33 years of service. For those active members retiring from the Local School Districts, Final Average Compensation is increased by the average additional payroll they received from their unused sick leave time. Average additional payroll for these members averaged around $10,000. Using these figures, we are computing that the load for unused sick leave should be increased to 2.0% and we recommend this change at this time.

Appendix A

Historical June CPI (U) Index

Year	CPI (U)	Year	CPI (U)
1960	29.6	1986	109.5
1961	29.8	1987	113.5
1962	30.2	1988	118.0
1963	30.6	1989	124.1
1964	31.0	1990	129.9
1965	31.6	1991	136.0
1966	32.4	1992	140.2
1967	33.3	1993	144.4
1968	35.7	1994	148.0
1969	34.7	1995	152.5
1970	38.8	1996	156.7
1971	40.6	1997	160.3
1972	41.7	1998	163.0
1973	44.2	1999	166.2
1974	49.0	2000	172.4
1975	53.6	2001	178.0
1976	56.8	2002	179.9
1977	60.7	2003	183.7
1978	65.2	2004	189.7
1979	72.3	2005	194.5
1980	82.7	2006	202.9
1981	90.6	2007	208.352
1982	97.0	2008	218.815
1983	99.5	2009	215.693
1984	103.7	2010	217.965
1985	107.6		

Appendix B

Capital Market Assumptions and Asset Allocation

Geometric Rates of Return and Standard Deviations by Asset Class

Asset Class	Expected Geometric Real Rates of Return	Standard Deviation
U.S. Equity	6.4%	23.9%
Non-US Equity	6.5%	23.6%
Fixed Income	1.6%	4.3%
Real Estate	5.8%	17.9%
Alternatives*	6.8%	16.7%
High Yield Bonds	3.1%	14.2%
Cash	1.5%	2.0%

Long Term Asset Allocation Targets

Asset Class	Asset Allocation
U.S. Equity	45%
Non-US Equity	17%
Fixed Income	24%
Real Estate	4%
Alternatives*	4%
High Yield Bonds	4%
Cash	2%

* Comprised of 2.4% Private Equity and 0.6% Timberland

Appendix C

Social Security Administration Wage Index

Year	Wage Index	Annual Increase	Year	Wage Index	Annual Increase
1957	$3,641.72		1984	$16,135.07	5.88%
1958	3,673.80	0.88%	1985	16,822.51	4.26
1959	3,855.80	4.95	1986	17,321.82	2.97
1960	4,007.12	3.92	1987	18,426.51	6.38
1961	4,086.76	1.99	1988	19,334.04	4.93
1962	4,291.40	5.01	1989	20,099.55	3.96
1963	4,396.64	2.45	1990	21,027.98	4.62
1964	4,576.32	4.09	1991	21,811.60	3.73
1965	4,658.72	1.80	1992	22,935.42	5.15
1966	4,938.36	6.00	1993	23,132.67	0.86
1967	5,213.44	5.57	1994	23,753.53	2.68
1968	5,571.76	6.87	1995	24,705.66	4.01
1969	5,893.76	5.78	1996	25,913.90	4.89
1970	6,186.24	4.96	1997	27,426.00	5.84
1971	6,497.08	5.02	1998	28,861.44	5.23
1972	7,133.80	9.80	1999	30,469.84	5.57
1973	7,580.16	6.26	2000	32,154.82	5.53
1974	8,030.76	5.94	2001	32,921.92	2.39
1975	8,630.92	7.47	2002	33,252.09	1.00
1976	9,226.48	6.90	2003	34,064.95	2.44
1977	9,779.44	5.99	2004	35,648.55	4.65
1978	10,556.03	7.94	2005	36,952.94	3.66
1979	11,479.46	8.75	2006	38,651.41	4.60
1980	12,513.46	9.01	2007	40,405.48	4.54
1981	13,773.10	10.07	2008	41,334.97	2.30
1982	14,531.34	5.51	2009	40,711.61	(1.50)
1983	15,239.24	4.87			

RATES OF SEPARATION FROM ACTIVE SERVICE – MALES

AGE	RATES OF WITHDRAWAL Service			DEATH	DISABILITY	RATES OF RETIREMENT BEFORE 27 YEARS OF SERVICE	RATES OF RETIREMENT AFTER 27 YEARS OF SERVICE*
	0 – 4	5 – 9	10+				
20	0.090			0.00012	0.00010		
21	0.090			0.00012	0.00010		
22	0.090			0.00013	0.00010		
23	0.090			0.00014	0.00010		
24	0.090			0.00015	0.00010		
25	0.090	0.0300		0.00015	0.00010		
26	0.090	0.0300		0.00017	0.00010		
27	0.090	0.0300		0.00017	0.00010		
28	0.090	0.0300		0.00018	0.00010		
29	0.090	0.0300		0.00019	0.00010		
30	0.090	0.0300	0.0300	0.00020	0.00020		
31	0.090	0.0305	0.0275	0.00023	0.00020		
32	0.090	0.0310	0.0250	0.00025	0.00030		
33	0.095	0.0315	0.0225	0.00029	0.00040		
34	0.095	0.0320	0.0200	0.00032	0.00040		
35	0.100	0.0325	0.0175	0.00035	0.00050		
36	0.100	0.0340	0.0168	0.00038	0.00058		
37	0.100	0.0355	0.0161	0.00041	0.00066		
38	0.100	0.0370	0.0154	0.00043	0.00074		
39	0.100	0.0385	0.0147	0.00044	0.00082		
40	0.100	0.0400	0.0140	0.00046	0.00090		
41	0.102	0.0400	0.0142	0.00048	0.00108		
42	0.104	0.0400	0.0144	0.00050	0.00126		
43	0.106	0.0400	0.0146	0.00052	0.00144		
44	0.108	0.0400	0.0148	0.00055	0.00162		
45	0.110	0.0400	0.0150	0.00058	0.00180		0.170
46	0.106	0.0400	0.0160	0.00061	0.00210		0.170
47	0.104	0.0400	0.0170	0.00064	0.00240		0.170
48	0.098	0.0400	0.0180	0.00067	0.00270		0.170
49	0.094	0.0400	0.0190	0.00071	0.00300		0.170
50	0.090	0.0400	0.0200	0.00074	0.00330		0.170
51	0.096	0.0390	0.0210	0.00083	0.00374		0.170
52	0.102	0.0380	0.0220	0.00089	0.00418		0.150
53	0.108	0.0370	0.0230	0.00097	0.00462		0.130
54	0.114	0.0360	0.0240	0.00107	0.00506		0.120
55	0.120	0.0350	0.0250	0.00124	0.00550	0.055	0.350
56	0.120	0.0350	0.0250	0.00146	0.00580	0.055	0.270
57	0.120	0.0350	0.0250	0.00167	0.00610	0.055	0.270
58	0.120	0.0350	0.0250	0.00191	0.00640	0.055	0.220
59	0.120	0.0350	0.0250	0.00215	0.00670	0.055	0.220
60	0.120	0.0350	0.0250	0.00244	0.00700	0.130	0.240
61	0.120	0.0350	0.0250	0.00284	0.00700	0.150	0.220
62	0.120	0.0350	0.0250	0.00324	0.00700	0.150	0.250
63	0.120	0.0350	0.0250	0.00378	0.00700	0.130	0.220
64	0.120	0.0350	0.0250	0.00425	0.00700	0.150	0.200
65	0.120	0.0350	0.0250	0.00480	0.00700	0.210	0.260
66	0.120	0.0350	0.0250	0.00555	0.00700	0.230	0.300
67	0.120	0.0350	0.0250	0.00619	0.00700	0.210	0.250
68	0.120	0.0350	0.0250	0.00674	0.00700	0.210	0.250
69	0.120	0.0350	0.0250	0.00747	0.00700	0.210	0.300
70	0.000	0.0000	0.0000	0.00821	0.00700	1.000	1.000

*Plus 10% in year when first eligible for unreduced retirement with 27 years of service.

TABLE 2
RATES OF SEPARATION FROM ACTIVE SERVICE – FEMALES

AGE	RATES OF WITHDRAWAL Service 0 – 4	5 – 9	10+	RATES OF DEATH	RATES OF DISABILITY	RATES OF RETIREMENT BEFORE 27 YEARS OF SERVICE	RATES OF RETIREMENT AFTER 27 YEARS OF SERVICE*
20	0.070			0.00007	0.00010		
21	0.070			0.00007	0.00012		
22	0.070			0.00007	0.00014		
23	0.075			0.00007	0.00016		
24	0.080			0.00007	0.00018		
25	0.085	0.0400		0.00008	0.00020		
26	0.090	0.0400		0.00008	0.00024		
27	0.090	0.0400		0.00008	0.00028		
28	0.090	0.0400		0.00009	0.00032		
29	0.090	0.0400		0.00009	0.00036		
30	0.090	0.0400	0.0165	0.00010	0.00040		
31	0.090	0.0395	0.0169	0.00011	0.00048		
32	0.090	0.0390	0.0173	0.00013	0.00056		
33	0.090	0.0385	0.0177	0.00015	0.00064		
34	0.090	0.0380	0.0181	0.00016	0.00072		
35	0.090	0.0375	0.0185	0.00017	0.00080		
36	0.089	0.0365	0.0178	0.00019	0.00092		
37	0.088	0.0355	0.0171	0.00020	0.00104		
38	0.087	0.0345	0.0164	0.00021	0.00116		
39	0.086	0.0335	0.0157	0.00022	0.00128		
40	0.085	0.0325	0.0150	0.00024	0.00140		
41	0.083	0.0325	0.0145	0.00026	0.00176		
42	0.081	0.0325	0.0140	0.00029	0.00212		
43	0.079	0.0325	0.0135	0.00032	0.00248		
44	0.077	0.0325	0.0130	0.00035	0.00284		
45	0.075	0.0325	0.0125	0.00037	0.00320		0.150
46	0.079	0.0330	0.0135	0.00040	0.00340		0.150
47	0.083	0.0335	0.0145	0.00043	0.00360		0.150
48	0.087	0.0340	0.0155	0.00046	0.00380		0.150
49	0.091	0.0345	0.0165	0.00050	0.00400		0.150
50	0.095	0.0350	0.0175	0.00055	0.00420		0.150
51	0.098	0.0360	0.0180	0.00061	0.00448		0.150
52	0.101	0.0370	0.0185	0.00070	0.00476		0.150
53	0.104	0.0380	0.0190	0.00079	0.00504		0.120
54	0.107	0.0390	0.0195	0.00090	0.00532		0.150
55	0.110	0.0400	0.0200	0.00103	0.00560	0.060	0.350
56	0.110	0.0400	0.0200	0.00120	0.00618	0.060	0.320
57	0.110	0.0400	0.0200	0.00140	0.00676	0.060	0.250
58	0.110	0.0400	0.0200	0.00157	0.00734	0.060	0.230
59	0.110	0.0400	0.0200	0.00177	0.00792	0.060	0.250
60	0.110	0.0400	0.0200	0.00201	0.00850	0.140	0.300
61	0.110	0.0400	0.0200	0.00229	0.00850	0.140	0.300
62	0.110	0.0400	0.0200	0.00263	0.00850	0.125	0.250
63	0.110	0.0400	0.0200	0.00301	0.00850	0.150	0.250
64	0.110	0.0400	0.0200	0.00346	0.00850	0.180	0.300
65	0.110	0.0400	0.0200	0.00390	0.00850	0.220	0.300
66	0.110	0.0400	0.0200	0.00439	0.00850	0.220	0.280
67	0.110	0.0400	0.0200	0.00496	0.00850	0.160	0.250
68	0.110	0.0400	0.0200	0.00550	0.00850	0.160	0.250
69	0.110	0.0400	0.0200	0.00608	0.00850	0.160	0.250
70	0.000	0.0000	0.0000	0.00672	0.00850	1.000	1.000

*Plus 10% in year when first eligible for unreduced retirement with 27 years of service.

TABLE 3

RATES OF ANTICIPATED SALARY INCREASES
(For Both Males and Females)

AGE	RATE*
19	1.047
20	1.046
21	1.044
22	1.043
23	1.041
24	1.039
25	1.037
26	1.035
27	1.033
28	1.031
29	1.029
30	1.027
31	1.026
32	1.024
33	1.023
34	1.021
35	1.020
36	1.019
37	1.018
38	1.017
39	1.016
40	1.015
41	1.014
42	1.014
43	1.013
44	1.012
45	1.011
46	1.011
47	1.011
48	1.010
49	1.010
50	1.010
51	1.009
52	1.009
53	1.008
54	1.008
55	1.008
56	1.008
57	1.007
58	1.007
59	1.007
60	1.007
61	1.007
62	1.006
63	1.006
64	1.006
65	1.005
66	1.005
67	1.005
68	1.005
69	1.005
70	1.005

*Does not include inflation assumption at 3.50% per annum.

TABLE 4

RATES OF MORTALITY FOR MEMBERS RETIRED ON ACCOUNT OF SERVICE AND BENEFICIARIES OF DECEASED MEMBERS

AGE	MALES	FEMALES	AGE	MALES	FEMALES
19	0.000226	0.000139	71	0.018161	0.014843
20	0.000235	0.000138	72	0.020164	0.016472
21	0.000248	0.000136	73	0.022460	0.017956
22	0.000260	0.000136	74	0.025057	0.019959
23	0.000276	0.000141	75	0.028538	0.021680
24	0.000289	0.000146	76	0.031808	0.023935
25	0.000308	0.000152	77	0.036105	0.026907
26	0.000335	0.000163	78	0.040942	0.029635
27	0.000346	0.000168	79	0.046431	0.032667
28	0.000356	0.000175	80	0.052647	0.036066
29	0.000373	0.000185	81	0.060125	0.039866
30	0.000402	0.000203	82	0.068542	0.044124
31	0.000451	0.000225	83	0.076403	0.048916
32	0.000508	0.000261	84	0.086701	0.054313
33	0.000571	0.000292	85	0.096240	0.061634
34	0.000635	0.000322	86	0.106702	0.070058
35	0.000699	0.000349	87	0.120616	0.079722
36	0.000761	0.000373	88	0.136225	0.088916
37	0.000818	0.000396	89	0.150545	0.101045
38	0.000855	0.000418	90	0.169280	0.112205
39	0.000887	0.000442	91	0.184380	0.124002
40	0.000919	0.000479	92	0.203973	0.136171
41	0.000953	0.000522	93	0.220035	0.151432
42	0.000994	0.000572	94	0.236072	0.163744
43	0.001041	0.000630	95	0.256992	0.175624
44	0.001097	0.000693	96	0.272762	0.186875
45	0.001161	0.000745	97	0.288083	0.201310
46	0.001219	0.000798	98	0.309050	0.210976
47	0.001282	0.000850	99	0.323665	0.219510
48	0.001347	0.000922	100	0.337730	0.226803
49	0.001416	0.000997	101	0.358628	0.237467
50	0.001487	0.001100	102	0.371685	0.244834
51	0.001669	0.001214	103	0.383040	0.254498
52	0.001781	0.001397	104	0.392003	0.266044
53	0.001947	0.001585	105	0.397886	0.279055
54	0.002134	0.001805	106	0.400000	0.293116
55	0.002469	0.002064	107	0.400000	0.307811
56	0.002921	0.002409	108	0.400000	0.322725
57	0.003331	0.002795	109	0.400000	0.337441
58	0.003819	0.003146	110	0.400000	0.351544
59	0.004306	0.003549	111	0.400000	0.364617
60	0.004887	0.004017	112	0.400000	0.376246
61	0.005674	0.004573	113	0.400000	0.386015
62	0.006473	0.005259	114	0.400000	0.393507
63	0.007552	0.006022	115	0.400000	0.398308
64	0.008508	0.006918	116	0.400000	0.400000
65	0.009607	0.007797	117	0.400000	0.400000
66	0.011091	0.008780	118	0.400000	0.400000
67	0.012374	0.009909	119	0.400000	1.000000
68	0.013480	0.011003	120	0.400000	1.000000
69	0.014936	0.012162	121	1.000000	1.000000
70	0.016413	0.013443	122	1.000000	1.000000

TABLE 5

RATES OF MORTALITY FOR MEMBERS RETIRED ON ACCOUNT OF DISABILITY

AGE	MALES	FEMALES	AGE	MALES	FEMALES
19	0.022571	0.007450	71	0.048307	0.055777
20	0.022571	0.007450	72	0.050174	0.059545
21	0.022571	0.007450	73	0.052213	0.063545
22	0.022571	0.007450	74	0.054450	0.067793
23	0.022571	0.007450	75	0.056909	0.072312
24	0.022571	0.007450	76	0.059613	0.077135
25	0.022571	0.007450	77	0.062583	0.082298
26	0.022571	0.007450	78	0.065841	0.087838
27	0.022571	0.007450	79	0.069405	0.093794
28	0.022571	0.007450	80	0.073292	0.100203
29	0.022571	0.007450	81	0.077512	0.107099
30	0.022571	0.007450	82	0.082067	0.114512
31	0.022571	0.007450	83	0.086951	0.122464
32	0.022571	0.007450	84	0.092149	0.130972
33	0.022571	0.007450	85	0.097640	0.140049
34	0.022571	0.007450	86	0.103392	0.149698
35	0.022571	0.007450	87	0.109372	0.159924
36	0.022571	0.007450	88	0.115544	0.170433
37	0.022571	0.007450	89	0.121877	0.182799
38	0.022571	0.007450	90	0.128343	0.194509
39	0.022571	0.007450	91	0.134923	0.205379
40	0.022571	0.007450	92	0.141603	0.215240
41	0.022571	0.008184	93	0.148374	0.223947
42	0.022571	0.008959	94	0.155235	0.231387
43	0.022571	0.009775	95	0.162186	0.237467
44	0.022571	0.010634	96	0.169233	0.244834
45	0.022571	0.011535	97	0.183408	0.254498
46	0.022571	0.012477	98	0.199769	0.266044
47	0.022571	0.013456	99	0.216605	0.279055
48	0.022571	0.014465	100	0.233662	0.293116
49	0.022571	0.015497	101	0.250693	0.307811
50	0.022571	0.016544	102	0.267491	0.322725
51	0.022571	0.017598	103	0.283905	0.337441
52	0.022571	0.018654	104	0.299852	0.351544
53	0.023847	0.019710	105	0.315296	0.364617
54	0.025124	0.020768	106	0.330207	0.376246
55	0.026404	0.021839	107	0.344556	0.386015
56	0.027687	0.022936	108	0.358628	0.393507
57	0.028975	0.024080	109	0.371685	0.398308
58	0.030268	0.025293	110	0.383040	0.400000
59	0.031563	0.026600	111	0.392003	0.400000
60	0.032859	0.028026	112	0.397886	0.400000
61	0.034152	0.029594	113	0.400000	0.400000
62	0.035442	0.031325	114	0.400000	0.400000
63	0.036732	0.033234	115	0.400000	1.000000
64	0.038026	0.035335	116	0.400000	1.000000
65	0.039334	0.037635	117	0.400000	1.000000
66	0.040668	0.040140	118	0.400000	1.000000
67	0.042042	0.042851	119	0.400000	1.000000
68	0.043474	0.045769	120	1.000000	1.000000
69	0.044981	0.048895			
70	0.046584	0.052230			

Appendix E

ADOPTION OF TABLES HEREIN PRESENTED

In order that the tables herein presented may have the official approval of the Board of Trustees, the following resolutions are recommended for adoption.

WHEREAS, The investigation of the mortality, service and compensation experience of the members of the Teachers' Retirement System of the State of Kentucky which was prepared as of June 30, 2010 indicated that the mortality tables and active service tables previously adopted by the Board of Trustees require modification in order that they may reflect more closely the actual past experience of the membership, and

WHEREAS, The actuary has prepared new tables of rates which he recommends for adoption, therefore, be it

RESOLVED, That the Board of Trustees, acting in accordance with Section 161.400 of the retirement law and upon the recommendation of the actuary, hereby discontinues the use in calculating the State's rates of contribution and in valuing the liabilities of the System of the active service tables and mortality tables adopted by the Board on September 18, 2006, and approves for use instead the attached active service tables, and mortality tables, and be in further

RESOLVED, That the use of the new tables in the valuation as of June 30, 2011 and in all actuarial valuations thereafter, is hereby approved.

The Board of Trustees of the Teachers' Retirement System of the State of Kentucky approved the preceding resolution at a meeting held on September 19, 2011.

BOARD OF TRUSTEES,
TEACHERS' RETIREMENT SYSTEM OF THE STATE OF KENTUCKY

By ....
                                    Chairman

Attest:

....
        Secretary