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Teachers' Retirement Board

Connecticut State Teachers' Retirement System
Experience Study for the
Five-Year Period Ending June 30, 2010

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April 7, 2011

Teachers' Retirement Board
State of Connecticut
765 Asylum Avenue
Hartford, CT 06105

Dear Members of the Board:

We are pleased to submit the results of a study of the economic and demographic experience for the Connecticut Teachers' Retirement System. The purpose of this study is to assess the reasonability of the actuarial assumptions and methods for the System. The actuarial assumptions are used by the actuary to provide a best estimate of the value of all benefits expected to be paid by the System over future years. The valuation uses various methods in determining the required funding necessary to accumulate a sufficient amount of assets to fully fund the expected benefit payments.

This experience study covers the five-year period from July 1, 2005 to June 30, 2010. As a result of the study, it is recommended that revised assumptions be adopted by the Board for future use. Changing assumptions will not change the actual cost of future benefits but will impact the measurement of the expected value of future benefits and the required contributions to maintain actuarial soundness.

The experience study includes all active and inactive members including retired members, disabled members and beneficiaries of deceased members. The demographic experience was studied separately for males and females where gender is a basis for material differences in experience.

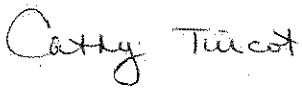
This report shows comparisons between the actual and expected cases of separation from active service, actual and expected number of deaths, and actual and expected salary increases. Tables and graphs are used to show the actual rates measured, the rates expected under the current assumptions and, where applicable, the proposed change to rates.

The recommended decrement tables are shown in Appendix A of this report. In the actuary's judgment, the recommended rates are suitable for use until further experience indicates that modifications are needed.

The experience study was performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems and who meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary



Cathy Turcot
Principal and Managing Director

Jonathan T. Craven, ASA, EA, FCA, MAAA
Senior Actuary

Section I: Introduction

Board Summary

The following table summarizes the findings and recommendations with regard to the actuarial assumptions and methods utilized for actuarial valuations of the Connecticut Teachers' Retirement System. Detailed explanations for the recommendations are found in the sections that follow.

Summary of Recommended Assumptions	
Economic Assumptions	
Rates of Salary Increase	Composed of Inflation component, Real Rate of Wage Increase component and a Service Based Scale.
Inflation	Recommend no change to the 3.00% rate of inflation.
Real Rate of Wage Increase	Recommend a decrease in the annual rate of real wage increase assumption from 1.00% to 0.75%.
Service Based	Recommend minor changes to the current service based rates. Also recommend use of a modified assumption for expected salary increases for 2010 though 2012.
Investment Rate of Return	Composed of Inflation component (3.00% from above) and Real Rate of Return component which is currently 5.50%. We find the 8.50% to be within the reasonable range for a long-term investment return assumption and have provided results using an 8.25% assumption for consideration.
Payroll Growth	Recommend change from 4.00% to 3.75% based upon the sum of the inflation and real rate of wage increase.
Demographic Assumptions	
Withdrawal	Recommend minor change only to male rates at ages 55 to 59.
Retirement	Recommend change to current assumption for early retirement only.
Mortality	Recommend no change to the current assumption.
Disability	Recommend no change to the current assumption.
Marriage Assumption	Recommend no change to the current assumption.
Actuarial Methods	
Actuarial Cost Method	Recommend no change to the current method.
Asset Smoothing	Recommend no change to the current method.
Amortization Method	Recommend no change to the current method.

Impact on Valuation Results

The following table highlights the impact of the recommended changes on the June 30, 2010 actuarial valuation results.

Impact on Principal Valuation Results
(Dollar amounts in thousands)

	Valuation Results 2010	Results with Recommended Assumptions using 8.50% Investment Return	Change in Results	Results with Recommended Assumptions using 8.25% Investment Return	Change in Results
Normal Cost Rate	10.11%	9.83%	(0.28%)	10.44%	0.33%
Funded Ratio	61.4%	61.6%	0.2%	60.1%	(1.3%)
Unfunded Actuarial Accrued Liability	$9,065,729	$8,976,831	($88,898)	$9,574,107	$508,378
Employer Annual Required Contribution Rate	19.20%	19.24%	0.04%	20.46%	1.26%
Expected FYE 2012 Employer Required Contribution	$757,246	$755,224	($2,022)	$802,990	$45,744

Section II: Economic Assumptions

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

- Investment Rate of Return
- Rates of Wage Inflation
- Rate of Payroll Growth

Each of these assumptions is separated into its relevant component parts. The investment rate of return assumption is comprised of an inflation component and a real rate of return component. Similarly the rate of wage inflation assumption is comprised of an inflation component, a real rate of wage increase component (also called the productivity component). Finally, the payroll growth assumption uses the components for inflation and real wage increases in determining a reasonable range for annual growth in total payroll. The actuary is tasked with defining a reasonable range and, where appropriate, recommending a best estimate for each of the economic assumptions.

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.

Section II: Economic Assumptions

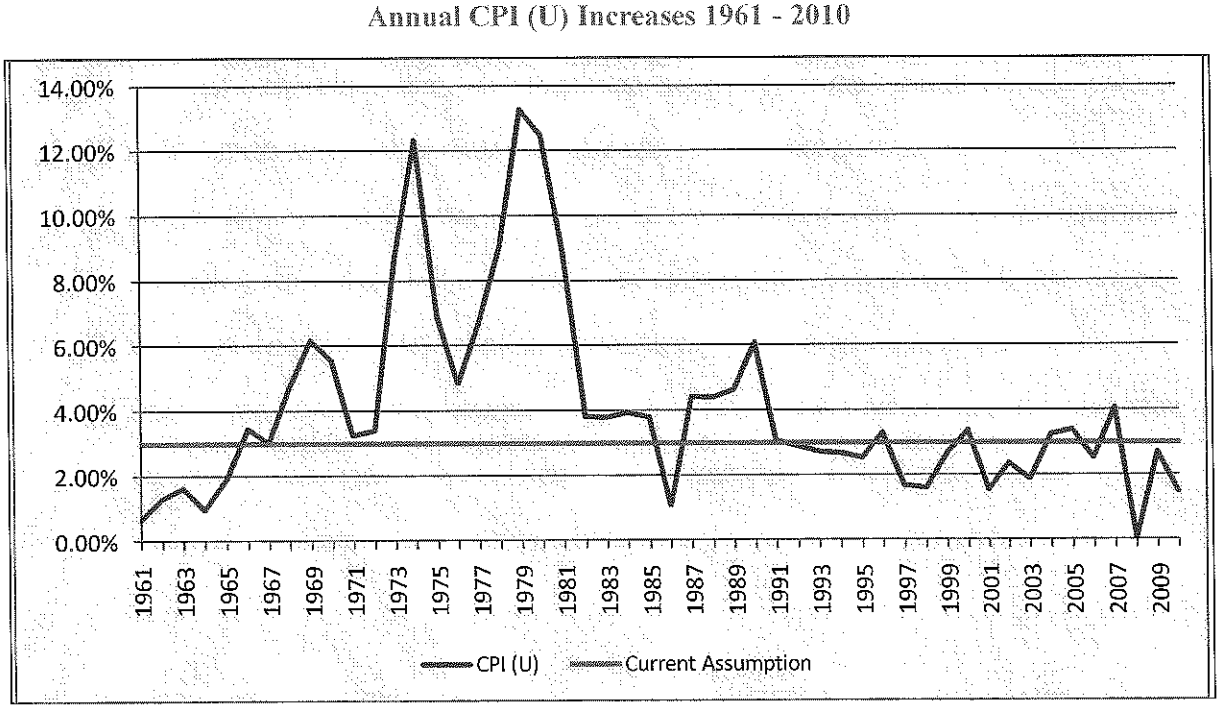
Inflation

The assumed rate of inflation is the expectation of the long-term annual rate of increase in the Consumer Price Index and is a component of all economic assumptions. This is also called price inflation.

It is important that the 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 set of assumptions as developed by the prior actuary does not explicitly set a price inflation assumption. However, in reading the prior experience study it appears that the 4.00% wage inflation assumption is comprised of 3.00% price inflation and 1.00% real wage increase assumptions.

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 graph below shows the annual increases in the CPI (U) as of December 31st for each of the latest 50 years compared to the current assumed 3.00% rate of inflation.



Section II: Economic Assumptions

The table below provides historical annualized rates and annual standard deviation of the CPI-U over periods ending December 31st.

Period	Annualized Rate of Inflation	Annual Standard Deviation
1926 - 2010	2.99%	4.18%
1950 - 2010	3.65%	2.96%
1960- 2010	4.14%	2.98%
1970 - 2010	4.39%	3.18%
1980 - 2010	2.96%	1.24%
1990 - 2010	2.47%	0.92%
2000 - 2010	2.42%	1.18%

Over shorter historical periods, the average annual rate of increase in the CPI-U has been below 3.00%. The period of high inflation from 1973 to 1982 has a significant impact on the averages over periods which include these rates. Further, the longest historic average rate of 2.99% is very close to the average rate of 2.96% over the prior 30 years (1980 to 2010) but the volatility of the annual rates in the more recent years has been markedly lower as indicated by the significantly lower annual standard deviations. Many experts attribute the lower average annual rates and lower volatility to the increased efforts of the Federal Reserve since the early 1980's to stabilize price inflation. We give greater weight to the 30-year historical period in our analysis.

Additional information to consider is obtained from measuring the spread on treasury inflation protected securities (TIPS) and from the prevailing economic forecasts. The spread between the yield on treasury securities (bonds) and the inflation indexed yield on TIPS of the same maturity is referred to as the "breakeven rate of inflation" and represents the bond market's expectation of inflation over the period to maturity. The table below provides the calculation of the breakeven rate of inflation as of December 31, 2010.

Years to Maturity	Bond Yield	TIPS Yield	Breakeven Rate of Inflation
10	3.30%	1.00%	2.30%
20	4.13%	1.59%	2.54%
30	4.34%	1.86%	2.48%

The bond market's expectation for the rate of inflation over the longer term is approximately 2.50% which is significantly lower than long term historical average annual rates. Additionally, based upon information contained in the "Survey of Professional Forecasters" for the fourth quarter of 2010 as published by the Philadelphia Federal Reserve Bank, the mean expected

annual rate of inflation for the ten years beginning January 1, 2011 is 2.20%. Although 10 years of future expectation is too short of a period for the basis of our inflation assumption, the information does provide additional evidence that the consensus expectations of these experts are for significantly lower rates of inflation than the historical average for the near term future.

Recommendation: It is difficult to accurately predict inflation. Current economic forecasts and the bond market suggest lower inflation over the next ten to thirty years which is 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 with a reasonable range of 2.0% - 4.0%, and recommend continued use of a 3.00% per year rate of inflation.

Price Inflation Assumption	
Current	3.00%
Reasonable Range	2.00% - 4.00%
Recommended	3.00%

Investment Rate of 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 future benefit payments for all active, inactive and retired members. Minor changes in this assumption can have a major impact on valuation results. The investment rate of return assumption should reflect the long-term average annual rate of return which can reasonably be expected based on the target asset allocation and capital market assumptions of the investment professionals.

The current assumption is 8.50%, consisting of a price inflation assumption of 3.00% and a real rate of return (return net of inflation) assumption of 5.50%.

Section II: Economic Assumptions

Past Experience: The recent experience over the last 10 years is shown in the table below.

Year Ending 6/30	Market Value Rate of Return
2001	(3.71%)
2002	(6.58%)
2003	2.13%
2004	15.34%
2005	10.49%
2006	11.08%
2007	17.47%
2008	(4.77%)
2009	(17.84%)
2010	13.45%
Average	3.09%

Historical returns over a short time period are not credible for the purpose of setting the long-term assumed future rate of return. Particular to this ten year period were two severe declines in the stock markets. In determining the reasonable range for this assumption we first look at long-term historical returns of broad market indices. We focus on the returns of stocks and high-quality bonds because they are the two major components of the portfolio and have significant amounts of performance history.

Analysis: Utilizing the historical real rates of return of the S&P 500 and the Intermediate Government Bond Index for the last 70 years, we determine the historical average annual rate of return of common allocation of large retirement funds (40% stocks/60% bonds to 70% stocks/30% bonds). On this basis the initial reasonable range for expected real rates of return is from 4.1% to 5.6%. This correlates well with the latest information available in the *Public Fund Survey* which shows the most common plan real rate of return assumption of 5.0% with a median equity allocation of 52%. We then add the recommended inflation assumption of 3.0% to the reasonable range of real returns. This results in an initial reasonable range for the long-term investment rate of return assumption of 7.1% to 8.6%.

In recommending a reasonable range for the investment rate of return assumption, we also consider the capital market assumptions of investment professionals. We were provided by the State Treasurer's Office the most recent capital market assumptions and target asset allocation for our analysis. We use statistical methods to approximate the longer-term expectation of returns. The Actuarial Standards of Practice prescribe that a reasonable range for this assumption would be between the 25th and 75th percentile of long-term expected returns. Our

analysis produces a reasonable range for the long-term investment return assumption, net of expenses, between 6.4% and 9.1% as shown in the table below.

Statistical Analysis of Expected Return Distribution							
Time Span In Years	Mean Rates of Return	Standard Deviation	Rates of Return by Percentile				
			5th	25th	50th	75th	95th
1	8.7%	14.2%	-13.0%	-1.3%	7.8%	17.7%	33.5%
5	7.9%	6.3%	-2.1%	3.6%	7.8%	12.1%	18.6%
10	7.9%	4.4%	0.7%	4.8%	7.8%	10.8%	15.3%
20	7.8%	3.1%	2.7%	5.7%	7.8%	9.9%	13.1%
30	7.8%	2.6%	3.6%	6.0%	7.8%	9.5%	12.1%
50	7.8%	2.0%	4.5%	**6.4%**	7.8%	**9.1%**	11.1%

We should note that the capital market assumptions produced by investment consultants vary over time. We recommend that we reassess the reasonable range with each significant future change to either the capital market assumptions or the asset allocations provided in the investment policy.

The most recent survey of large public plans, *Public Fund Survey* reported as of November 2010 by the National Association of State Retirement Administrators shows that most of the 126 funds surveyed have an 8.0% investment return assumption and 31 funds have a return assumption greater than 8.0% (13 funds use an 8.5% return assumption). Neither of the Connecticut statewide systems is included in the survey.

Recommendation: A blending of the reasonable range for the investment return assumption using the historical broad market basis (7.1% to 8.6%) and the long-term reasonable range produced using the investment professional's capital market assumptions and target allocation of the System (6.4% to 9.1%), results in the reasonable range to be from 6.8% to 8.9%. We confirm that the current 8.50% assumption is within the reasonable range for this assumption, although at the higher-end of this range. For the Board's consideration we also provide the impact of reducing the investment rate of return assumption to 8.25%.

Investment Return Assumption	
Current	8.5%
Reasonable Range	6.8% - 8.9%
Recommended	8.5%
Alternative for Consideration	8.25%

Section II: Economic Assumptions

Wage Inflation

Background: Wage inflation, thought of as the "across the board" rate of salary increases is comprised of the price inflation assumption combined with an assumption for the real rate of wage increases. The real rate of wage increase is the rate of increase in wages above price inflation. In constructing the rates of salary increases assumptions, the rate of wage inflation assumption is further combined with an assumption for service based salary increases. The service based salary increase assumption is provided in the demographic assumption section of the report. The current assumption implies the assumed real rate of wage increase is 1.00%.

Past Experience: The Social Security Administration publishes data on wage growth in the United States. 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 end point.

Period Ending 12/31/2009	Average Annual Rate of Wage Inflation	Average Annual Rate of Price Inflation	Average Annual Rate of Real Wage Increase
5 Years	2.7%	2.3%	0.4%
10 Years	2.9%	2.4%	0.5%
20 Years	3.6%	2.6%	1.0%
30 Years	4.3%	3.2%	1.1%
50 Years	4.8%	3.7%	1.1%

Over the past 5 years of experience data we analyzed, the apparent rate of real wage increases in the data was 0.82% which is based upon the average rate of salary increases above price inflation for active members with no apparent service based salary increases.

Recommendation: We develop the reasonable range to be 0.5% to 1.1%, and recommend use of a 0.75% per year real rate of wage increase. This represents a decrease of 0.25% in this assumption.

Real Rate of Wage Increase Assumption	
Current	1.00%
Reasonable Range	0.50% - 1.1%
Recommended	0.75%

Section II: Economic Assumptions

Payroll Growth Assumption

Background: The assumed future increases in the total payroll of active members is an assumption that only affects the amortization of the unfunded accrued liability and therefore the contribution amounts necessary to fully amortize the unfunded actuarial accrued liability over the specified amortization period. The reasonable range for this assumption is typically between the rates of price inflation and the rate of wage inflation.

The current assumption for the payroll growth assumption is 4.00% which is the assumed rate of wage inflation over the period (3.00% price inflation plus 1.00% real rate of wage increases).

Past Experience: Over the past 10 years, the total annual payroll of the System as shown in actuarial valuations has grown at an average annual rate of 3.8%. Over the past two years, the average annual rate of growth is 3.6%.

Recommendation: We recommend we lower this assumption from 4.00% to 3.75% to reflect the decrease to the assumed annual rate of wage inflation as presented above.

Real Rate of Wage Increase Assumption	
Current	4.00%
Reasonable Range	3.00% to 3.75%
Recommended	3.75%

Section III: Demographic Assumptions

Demographic Assumptions

There are several demographic assumptions used in the actuarial valuations performed for the Connecticut State Teachers' Retirement System. They are:

- Rates of Withdrawal
- Rates of Disability
- Rates of Service Retirement
- Rate of Mortality
- Rates of Service Based Salary Increases

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. The analysis of the experience data focuses on the number of members exposed to each decrement (i.e., retirement, withdrawal, mortality, etc.) and those who experience an event. The raw rates are then established based on this analysis. The raw rates are then compared to the assumed rates. 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 the impact of recent economic events, 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

Background: The rates of withdrawal are used to determine the expected number of separations from active service which will occur prior to eligibility for retirement for reasons other than death and disability (e.g., termination of employment). The assumption does not involve the analysis of the election of separating members to receive a refund of eligible funds. There are two separately developed sets of assumed rates for the withdrawal assumption. The first set of rates is the expected rates of withdrawal from active service for each year of service less than 10 years of service. These separating members are entitled to only a full refund of eligible funds. The second set of rates is the expected age-based rates for active members with 10 or more years of service. These separating members are eligible to elect between a full refund of eligible funds or a deferred annuity based upon benefit accrued to date of separation payable as early as age 60.

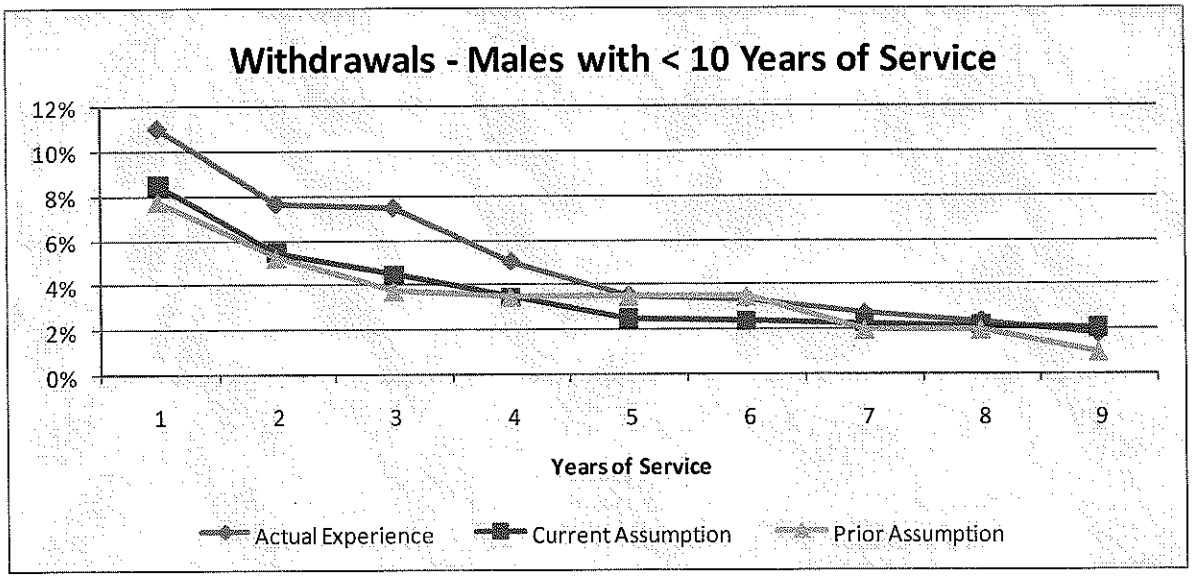
Rates of Withdrawal with Less than 10 Years of Service

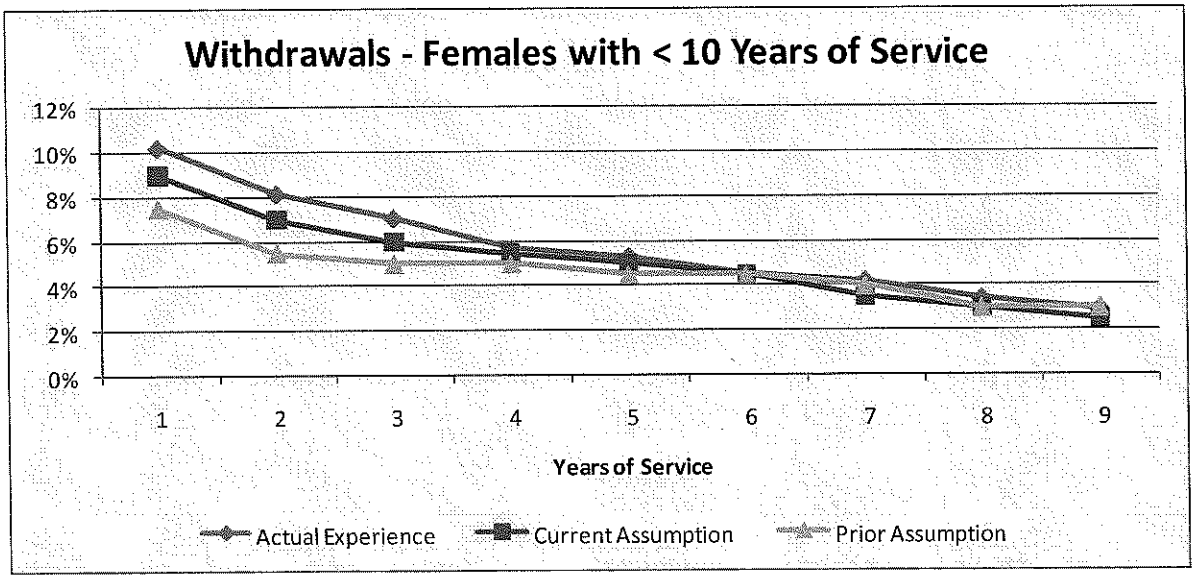
Past Experience: For the service based rates (less than 10 years of service), the experience indicates that during the period studied, there were more withdrawals than expected. The following tables provide a comparison of the actual and expected number of withdrawals for members with less than 10 years of service.

Number of Withdrawals Males with less than 10 years of service		
Service	Actual Withdrawals	Expected Withdrawals under Current Rates
0	156	59.5
1	402	310.2
2	264	189.9
3	252	151.7
4	168	115.9
5	116	81.9
6	110	77.8
7	87	73.4
8	72	67.0
9	51	59.4
Total	1,678	1,186.6
Actual to Expected Ratio		1.414

Number of Withdrawals Females with less than 10 years of service		
Service	Actual Withdrawals	Expected Withdrawals under Current Rates
0	424	146.2
1	1,239	1,089.4
2	923	790.7
3	755	641.1
4	585	565.5
5	531	498.4
6	443	438.5
7	401	332.4
8	302	264.2
9	237	201.6
Total	5,840	4,967.8
Actual to Expected Ratio		1.176

An actual to expected ratio of greater than 1.00 results from more actual withdrawals than anticipated and would typically generate actuarial gains to the System. The actual rates of withdrawal over the study period are compared with the rates produced in the past two experience studies (current expected and prior expected rates) in the following graphs.





Recommendation: We note that for both males and females, the expected rates have predicted fewer withdrawals than the actual experience for those with less than 5 years of service. These withdrawing members have a very minor liability which is based upon a distribution of all eligible funds. The actual to expected ratio for males with from 5 through 9 years of service was 1.213 and for females with the same service range was 1.103. The assumption was revised at the time of the last experience study and given the current poor labor market conditions, we are not inclined to increase the future expectation of withdrawal for either gender at this time.

Rates of Withdrawal with 10 or More Years of Service

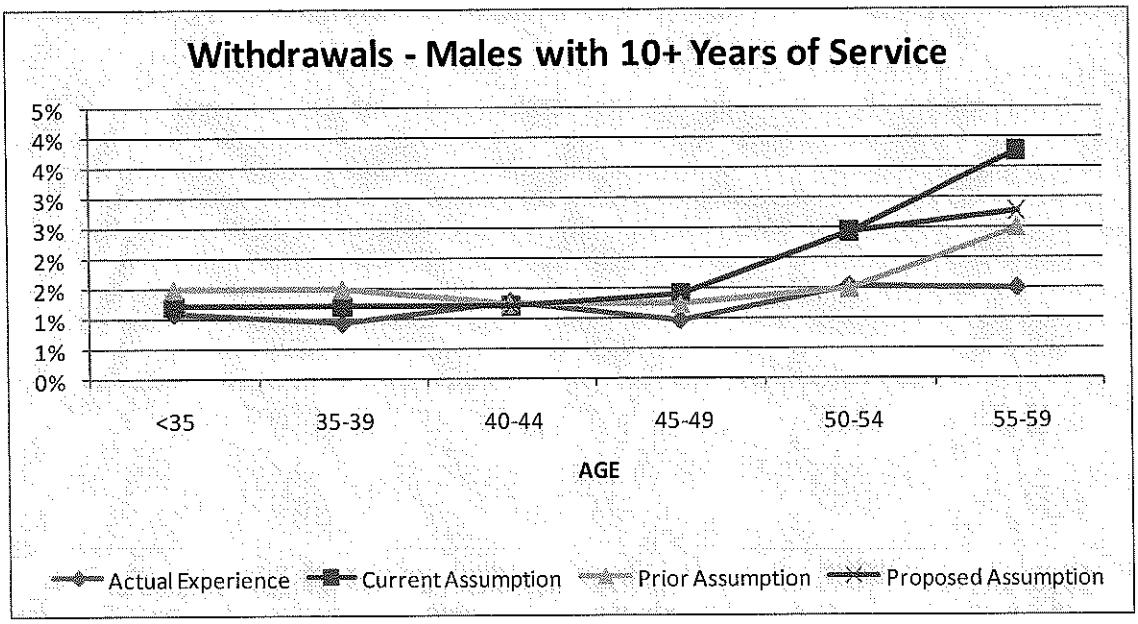
Past Experience: For these age based rates for members with at least 10 years of service, the experience indicates that during the period studied there were fewer withdrawals than expected for fully vested members. The following tables provide a comparison of the actual and expected number of withdrawals for members with 10 or more years of service. This table for male rates also includes our recommended change to the age 55 – 59 rates.

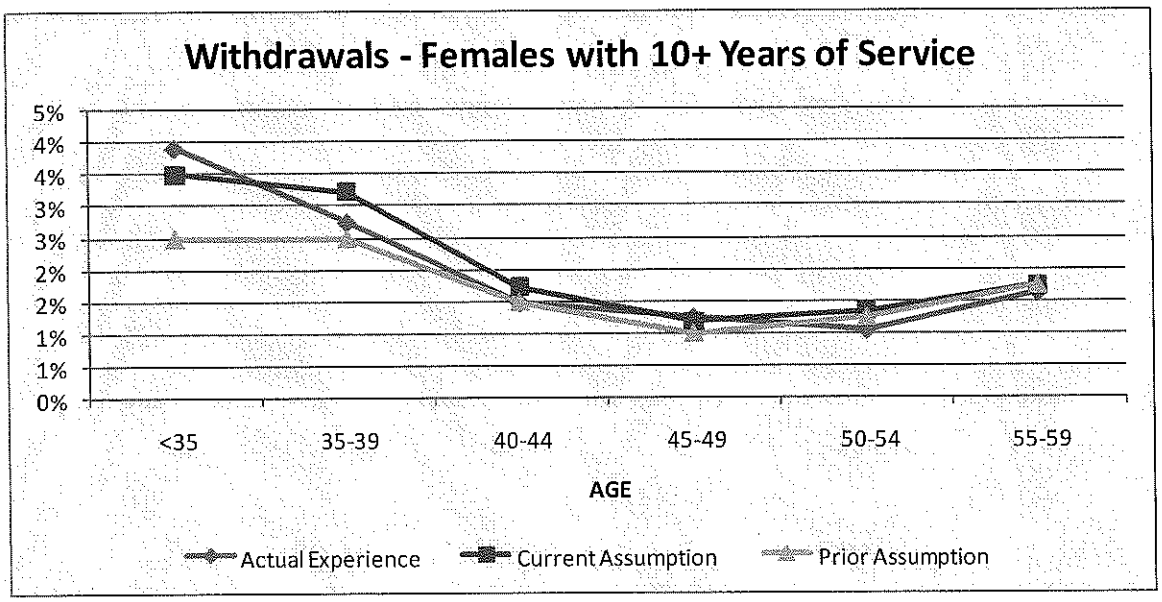
Number of Withdrawals Males with 10 or more years of service			
Age	Actual Withdrawals	Expected Withdrawals under Current Rates	Expected Withdrawals under Proposed Rates
Under 35	6	6.6	6.6
35-39	31	40.0	40.0
40-44	46	43.3	43.3
45-49	35	50.9	50.9
50-54	48	76.0	76.0
55-59	24	60.3	44.4
Total	190	277.0	261.1
Actual to Expected Ratio		0.686	0.728

Number of Withdrawals Females with 10 or more years of service		
Age	Actual Withdrawals	Expected Withdrawals under Current Rates
Under 35	73	65.3
35-39	249	291.9
40-44	156	180.6
45-49	145	137.3
50-54	134	172.6
55-59	141	151.2
Total	898	998.9
Actual to Expected Ratio		0.899

Since the rates of withdrawal for vested members are much lower than non-vested members, there are not a large number of withdrawals expected or experienced. Again, we do not feel the current experience, as impacted by the significant change to the labor markets and economy, are completely credible for making modification to the current rates. We recommend only a change to the rates for males age 55 to 59 based upon the review of the prior rates set in the two prior experience studies. The actual rates of withdrawal over the study period are compared with the rates produced in the past two experience studies (current expected and prior expected rates) in the following graphs. Our recommended change to the male age 55 – 59 rates is also shown.

Section III: Demographic Assumptions



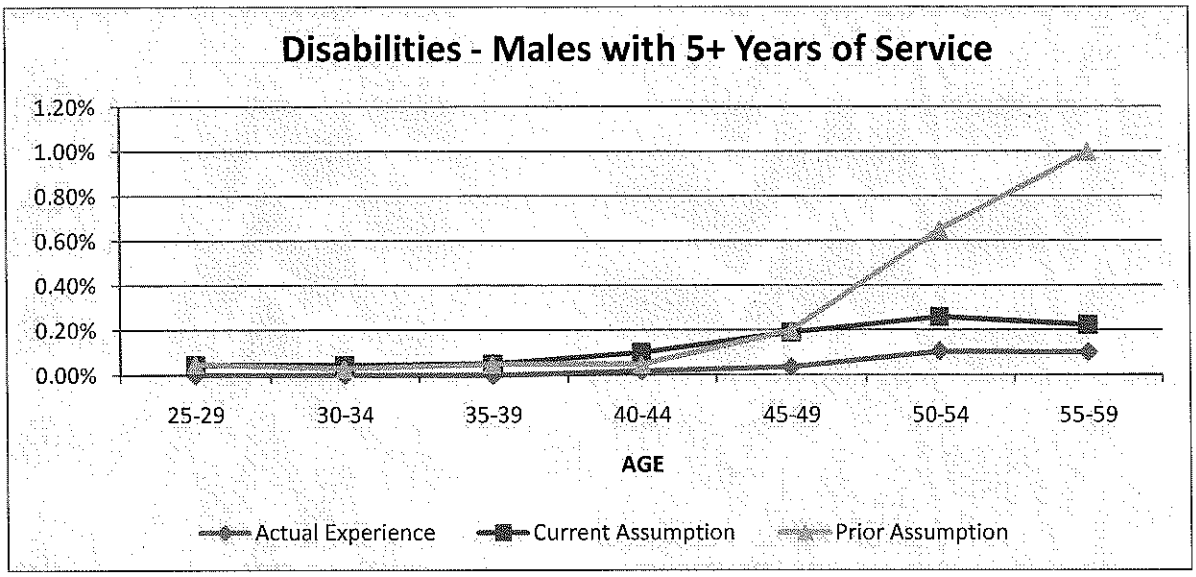


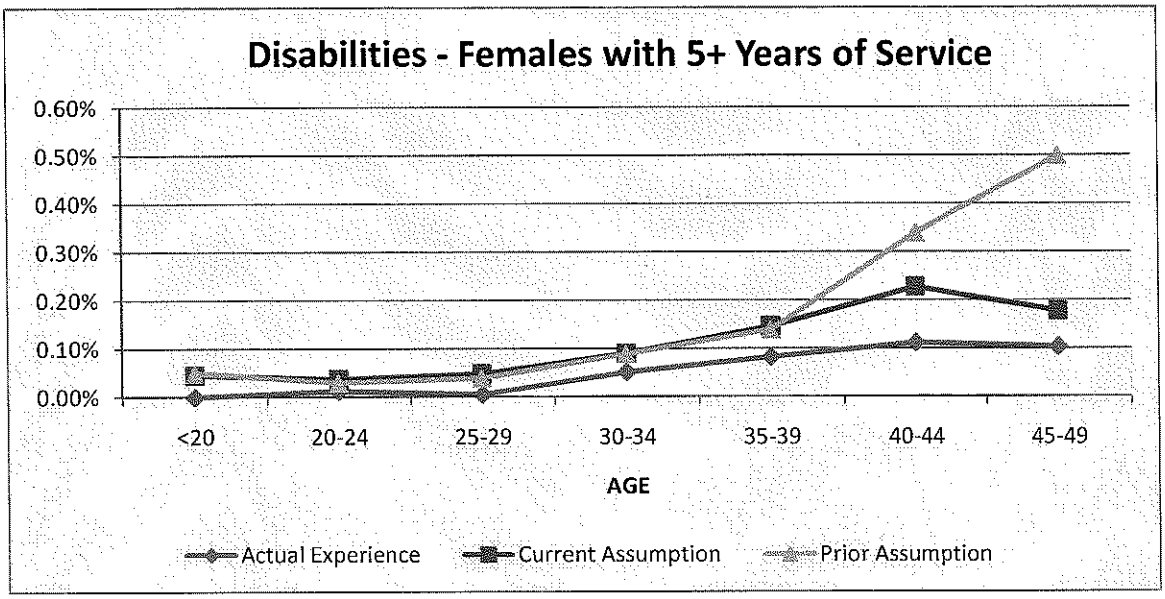
Recommendation: It is common for rates of withdrawal for vested members to be lower than expected during times of tighter labor markets. It is our opinion that current assumed rates are more credible estimates for the long term future rates of withdrawal than the current experience. We recommend only an adjustment to the rates of males age 55 to 59 in order to partially reflect the current experience and the rates from the prior experience study for this demographic.

Rates of Disability

Background: The rates of disability are used to anticipate the expected number of separations due to disabilities of eligible active members. As rates of disability are very small, the number of disabilities incurred and expected is small relative to other decrements. When a disability does occur, it will result in an increase in the plan liability to reflect the immediate annuity payable to eligible disabled members at typically earlier ages.

Past Experience: Current experience represents a decline in the rates of disability from the expected rates. In the prior experience study, the prior actuary adjusted rates to better reflect the experience over the 5 year study period ending June 30, 2005. Below we provide the charts of the current actual rates observed, the current expected rates and the rates expected prior to 2005.





Recommendation: The charts show that the current expected rates are a good fit to the age related trend in actual disabilities. The assumption was revised at the time of the last experience study. We recommend no change to the current rates of disability.

Rates of Retirement

Background: The rates of retirement are used to determine the expected number of separations from active service due to retirement. The plan provides for three types of retirement based on different eligibility requirements. There are three sets of retirement decrements to handle the different types of retirement.

Rates of Normal Retirement

Past Experience:

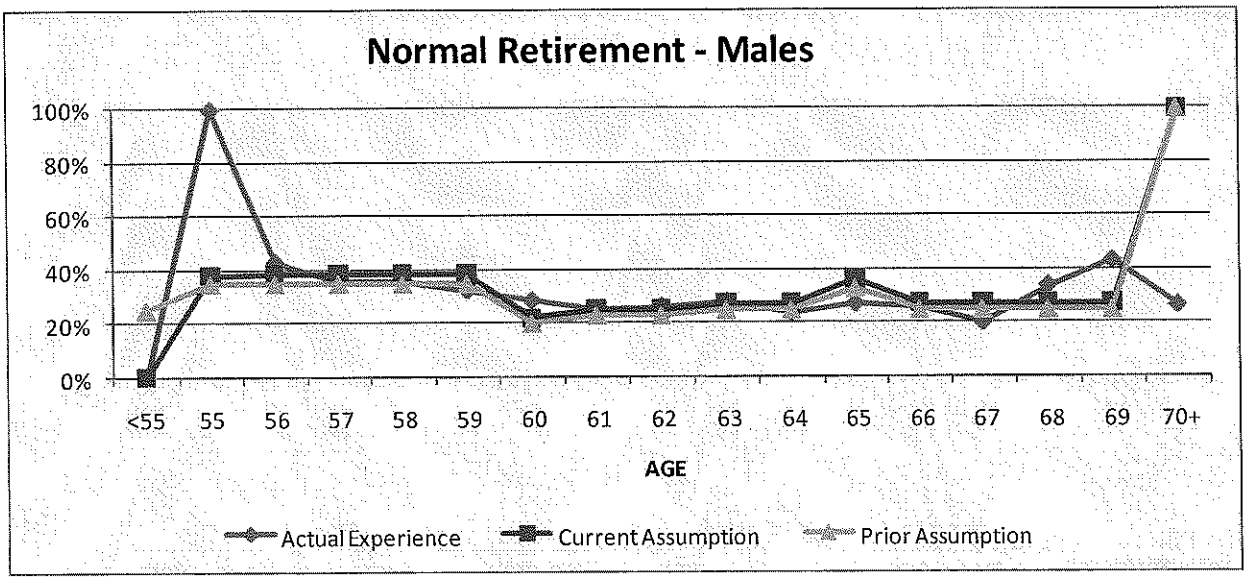
Number of Retirements Males eligible for normal retirement		
Age	Actual Retirements	Expected Retirements under Current Rates
Under 55	0	0.0
55	1	0.4
56	12	10.8
57	136	146.3
58	235	254.5
59	233	277.2
60	382	295.7
61	237	239.6
62	183	176.8
63	127	126.0
64	74	85.8
65	59	79.2
66	40	42.7
67	21	28.9
68	24	19.6
69	19	12.1
70 and over	28	106.0
Total	1,811	1,901.5
Actual to Expected Ratio		0.952

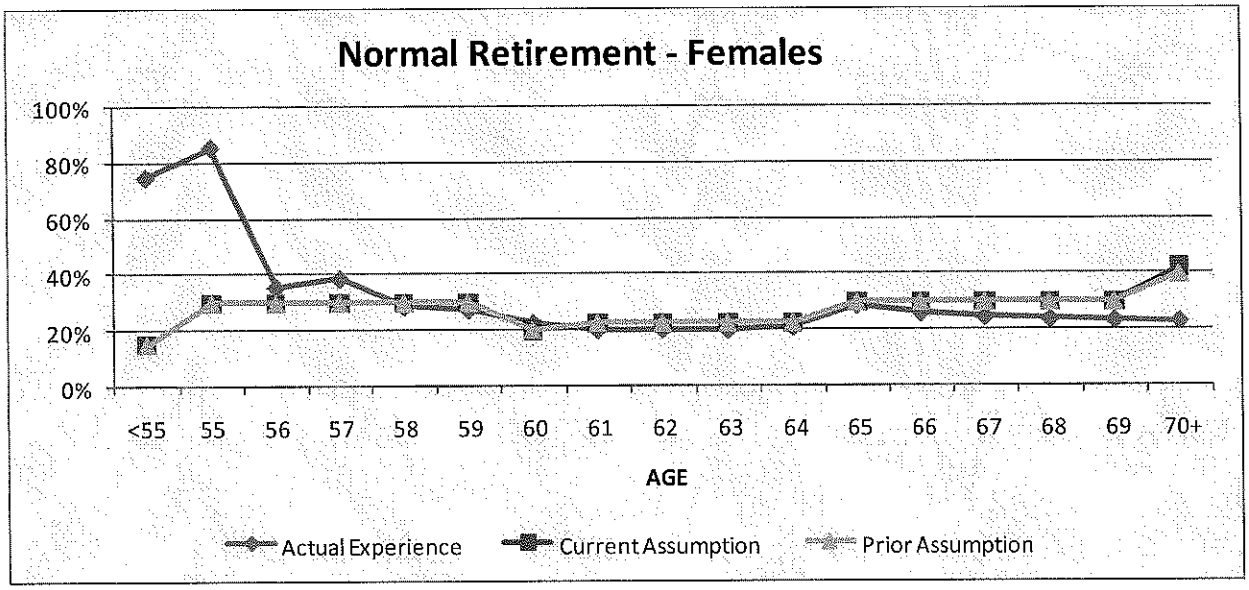
Over the past five years, there were 1,811 male actual normal retirements compared to 1,902 predicted by the normal retirement rates for males.

Number of Retirements Females eligible for normal retirement		
Age	Actual Retirements	Expected Retirements under Current Rates
Under 55	9	1.8
55	6	2.1
56	31	26.1
57	366	283.8
58	330	345.6
59	295	321.3
60	738	651.4
61	497	553.2
62	378	416.9
63	282	315.2
64	222	236.0
65	226	233.7
66	137	157.5
67	88	107.1
68	62	78.0
69	42	53.7
70 and over	125	228.4
Total	3,834	4,011.8
Actual to Expected Ratio		0.956

Over the past five years, there were 3,834 female actual normal retirements compared with 4,012 predicted by the normal retirement rates for females. As seen in the tables above for both males and females, the current assumed rates continue to be a good estimate of the expectation of normal retirement rates. The following graphs show the actual rates of retirement by age compared with the current assumed retirement rates as well as with the assumed rates prior to the 2005 study. On the following graphs, please note the large discrepancies in the rates at the early ages are based on very small amounts of exposure (not many members were eligible but a majority of them did retire). In other words, this small group is very visible on the graphs but has little overall impact.

Section III: Demographic Assumptions





Recommendation: The overall actual to expected ratio is well within the reasonable range and the current assumption remains a good estimate of future expectation. We recommend no change to the current rates of normal retirement for males or females.

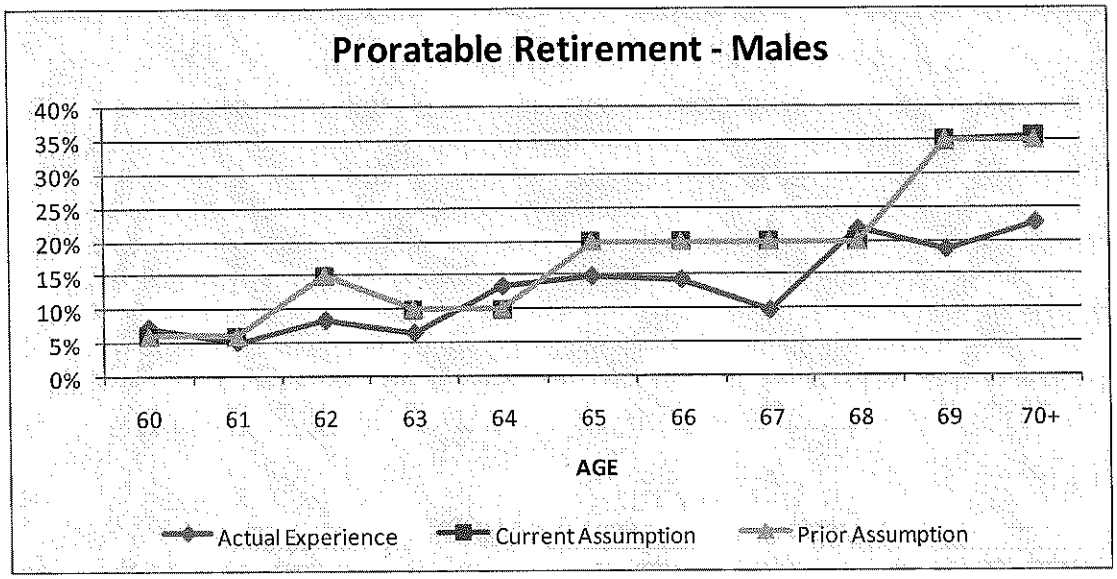
Rates of Proratable Retirement

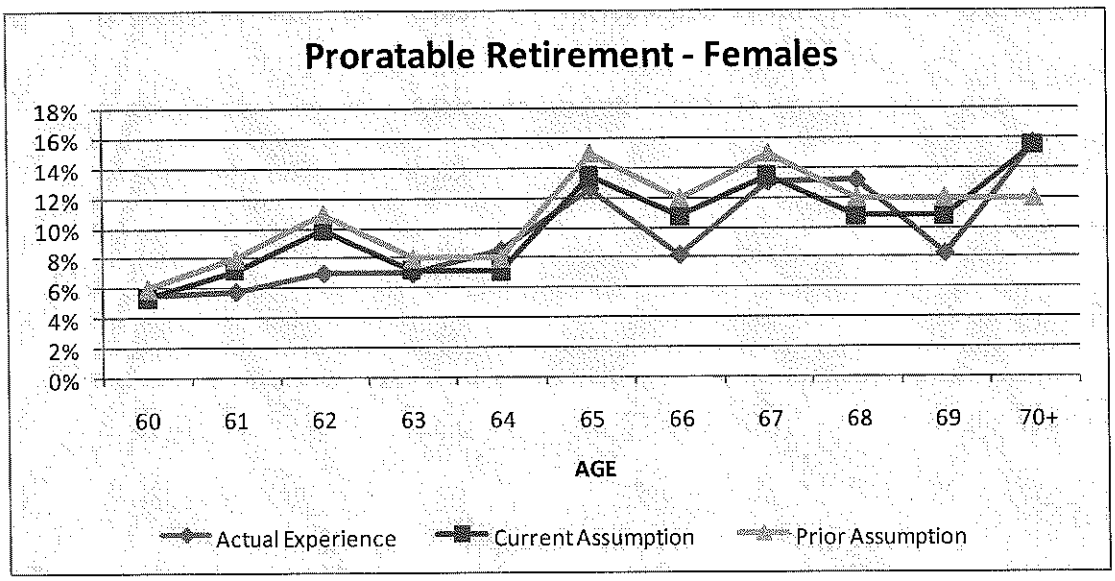
Past Experience:

Number of Retirements Males eligible for proratable retirement		
Age	Actual Retirements	Expected Retirements under Current Rates
60	16	13.3
61	9	10.6
62	12	21.6
63	7	10.9
64	10	7.5
65	8	10.8
66	7	9.8
67	3	6.2
68	5	4.6
69	3	5.6
70 and over	5	7.9
Total	85	108.8
Actual to Expected Ratio		0.781

Number of Retirements Females eligible for proratable retirement		
Age	Actual Retirements	Expected Retirements under Current Rates
60	64	62.5
61	52	64.3
62	45	63.3
63	33	33.9
64	26	21.9
65	28	29.8
66	12	15.8
67	14	14.4
68	9	7.3
69	4	5.2
70 and over	16	15.9
Total	303	334.3
Actual to Expected Ratio		0.906

Over the five year period, there were 85 male proratable retirements compared with 109 expected. There were 303 female proratable retirements compared with 334 expected. The following graphs show the actual rates of proratable retirement based on age compared with the current assumed rates of retirement as well as with the assumed rates prior to the five year study period. The current period represents a departure from the experience of the prior 10 years and is impacted by the more recent and shorter term economic downturn. The following charts show the current actual rates along with the current expected rates and the rates expected prior to the 2005 study.





Recommendation: The current experience does not provide compelling evidence to adjust the expected rates of proratable retirement. We do not recommend a change to the proratable retirement assumptions for males or females.

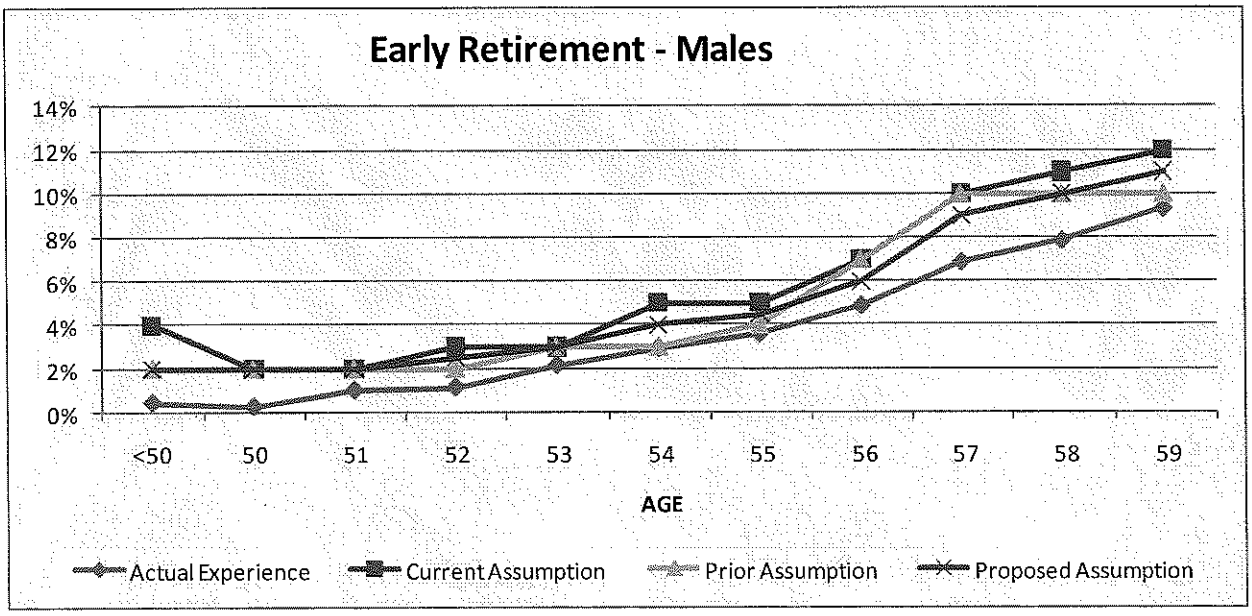
Rates of Early Retirement

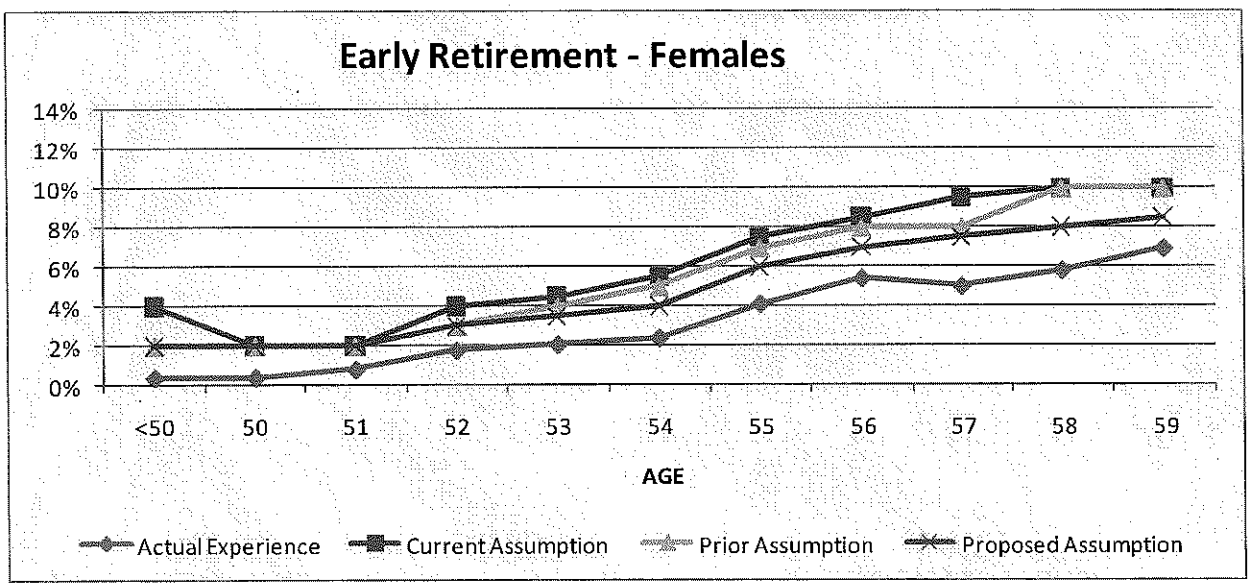
Past Experience: The following tables provide the actual and expected counts of early retirements and include expected counts under the proposed change to the assumption.

Number of Retirements Males eligible for early retirement			
Age	Actual Retirements	Expected Retirements under Current Rates	Expected Retirements under Proposed Rates
Under 50	2	18.1	9.1
50	1	7.4	7.4
51	5	9.9	9.9
52	7	18.3	15.3
53	17	23.6	23.6
54	29	49.4	39.5
55	50	69.8	62.8
56	77	110.7	94.9
57	94	136.6	122.9
58	88	123.0	111.8
59	83	106.7	97.8
Total	453	673.4	595.0
Actual to Expected Ratio		0.673	0.761

Number of Retirements Females eligible for early retirement			
Age	Actual Retirements	Expected Retirements under Current Rates	Expected Retirements under Proposed Rates
Under 50	5	54.2	27.1
50	4	20.9	20.9
51	11	27.7	27.7
52	30	67.9	50.9
53	45	97.7	76.0
54	61	140.0	101.8
55	156	283.3	226.7
56	217	340.2	280.1
57	167	315.9	249.4
58	168	288.3	230.6
59	181	260.9	221.8
Total	1,045	1,896.9	1,513.0
Actual to Expected Ratio		0.551	0.691

There were 453 actual male early retirements compared with 673 predicted by the early retirement assumptions. There were 1,045 female early retirements compared with 1,897 predicted by the early retirement assumptions. The following graphs show the actual rates of early retirement based on age compared with the current early retirement assumptions as well as with the assumptions prior to the 2005 study. Our recommended rates are also included.





Recommendation: The assumed rates of early retirement were increased at the time of the last experience study but the actual number of early retirements has decreased from the prior study period. We recommend decreasing the assumed early retirement rates for both males and females to better recognize the recent decline in early retirements. As will be noted, our recommended rates only partially reflect the recent experience and maintain a sufficient margin above the current experience to address the longer term historic trend of higher earlier retirement rates.

Rates of Mortality

Background: Assumed rates of post-retirement mortality are very important assumptions for the actuarial valuation because they predict life expectancies and therefore, the duration of pension payments. As life expectancies are expected to continue to increase in the future, mortality rates are sometimes projected by actuaries to anticipate expected mortality improvements. The current mortality rates are projected to 2019.

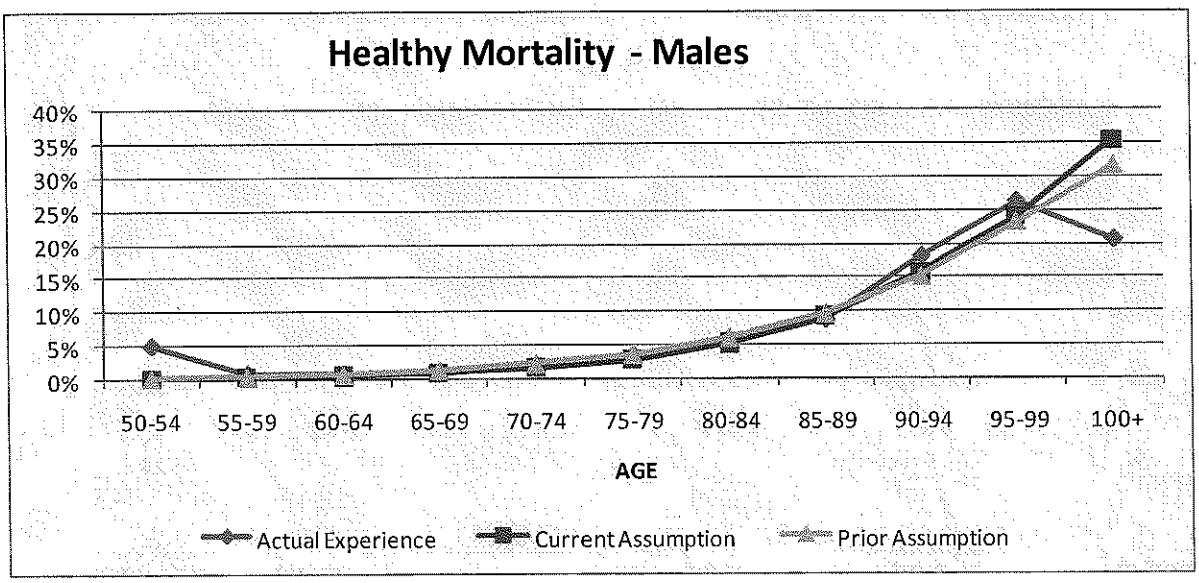
Rates of Healthy Post-Retirement Mortality

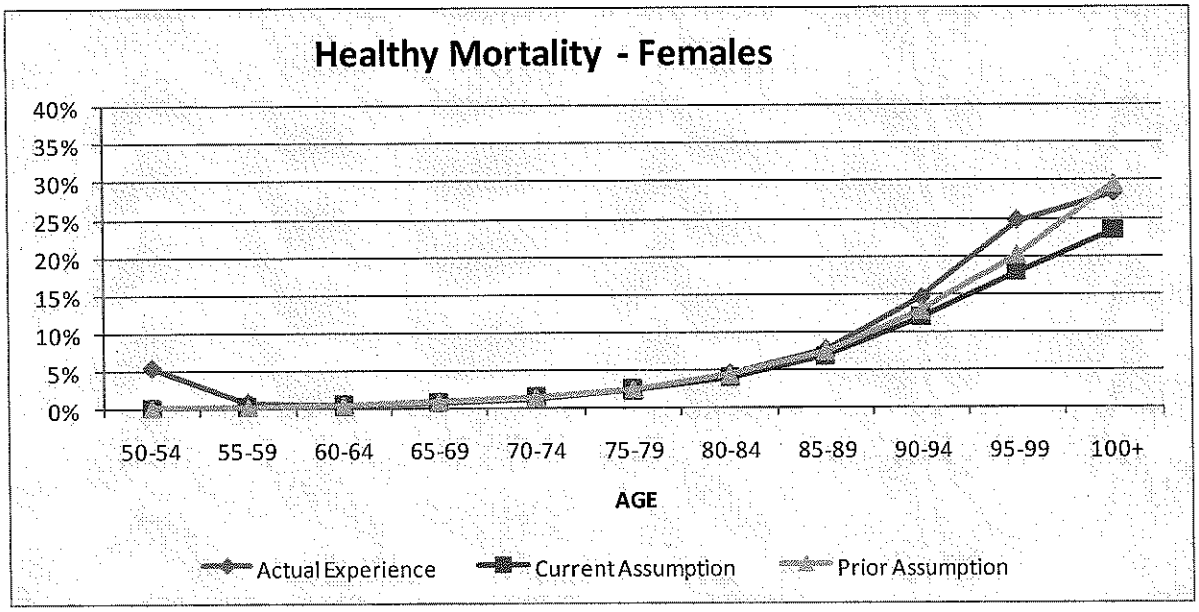
Past Experience:

Number of Deaths Service Retirements and Beneficiaries Males		
Age	Actual Deaths	Expected Deaths under Current Rates
50-54	7	0.2
55-59	22	8.2
60-64	87	62.4
65-69	97	103.5
70-74	178	144.6
75-79	261	219.1
80-84	262	256.2
85-89	187	197.8
90-94	104	90.6
95-99	24	22.0
100 and over	6	10.3
Total	1,235	1,115.0
Actual to Expected Ratio		1.108

Number of Deaths Service Retirements and Beneficiaries Females		
Age	Actual Deaths	Expected Deaths under Current Rates
50-54	21	0.5
55-59	48	16.9
60-64	110	92.5
65-69	106	150.0
70-74	166	207.1
75-79	310	295.7
80-84	379	336.5
85-89	409	367.2
90-94	394	325.7
95-99	226	164.3
100 and over	44	36.4
Total	2,213	1,992.7
Actual to Expected Ratio		1.111

Because the current assumed rates of mortality for both males and females anticipate future mortality improvements, we would expect actual deaths during the study period to be somewhat greater than expected deaths which is the case. The graphs below show a comparison of the previous, present, and actual rates of post-retirement deaths.





Recommendation: The experience for post-retirement mortality indicates that overall approximately 11% more members have died than expected during the study period which has resulted in modest gains to the system. The assumption currently in use is the RP-2000 Combined Mortality Table projected 19 years using scale AA, with a two year setback for males and females. (A two year "set back" means that the tabular rates for a 60 year old would be applied as the mortality rate for a 62 year old.) We recommend no change to the post-retirement mortality assumption.

Rates of Disability Mortality

Past Experience: There were 22 deaths of male disabled members compared with 5.8 expected over the study period. There were 83 female disabled deaths compare with 17.9 expected over the study period. Since there are not a large number of disabled members in the data, the experience observed is not statistically significant for assessing mortality rates.

Number of Deaths Disabled Members Males		
Age	Actual Deaths	Expected Deaths under Current Rates
50-54	3	0.4
55-59	11	2.3
60-64	5	0.7
65-69	0	0.6
70-74	2	1.3
75-79	0	0.2
80-84	1	0.3
85-89	0	0.0
90-94	0	0.0
95-99	0	0.0
100 and over	0	0.0
Total	22	5.8
Actual to Expected Ratio		3.806

Number of Deaths Disabled Members Females		
Age	Actual Deaths	Expected Deaths under Current Rates
50-54	4	1.1
55-59	44	5.7
60-64	17	1.7
65-69	2	0.5
70-74	4	1.1
75-79	1	0.3
80-84	1	0.8
85-89	1	2.1
90-94	6	3.5
95-99	2	0.8
100 and over	1	0.3
Total	83	17.9
Actual to Expected Ratio		4.637

Recommendation: The current mortality assumption for disabled members is the mortality assumption for healthy retired members set forward 10 years. This assumption has a large degree of conservatism but does not materially affect the valuation results due to the small number of disabled retirees compared to service retirees. We recommend no change to the current assumption at this time.

Rates of Pre-Retirement Mortality

Recommendation: Again, due to the very limited number of active member deaths, we recommend the active mortality assumption continue to be the same mortality assumption as for retirees and beneficiaries and continue to reduce the rates at each age by 25%. This continues to provide sufficient margin in expected rates of death of active members. As with disability benefits, active member death benefits are ancillary to retirement benefits and therefore, the experience of active member mortality does not materially affect valuation results.

Rates of Service Based Salary Increases

Background: The assumed rates of salary increase provide the expected growth in future salaries both for approximating the future benefits to be provided and the future amounts expected to be contributed to the System through normal cost contributions of members and the employer. Therefore, this assumption is very material to valuation results. The actuarial standards of practice recommend a "building block" approach to developing this assumption. Under this approach, the assumption is composed of an assumption for wage inflation (the "across the board" increases of active salaries), and an assumed salary increase scale based on the years of service.

The first step in developing the service based rates of increase is to subtract the apparent wage inflation component from the actual salary rates of increase as measured over the study period. The average annual rate of inflation over the five-year period ending June 30, 2010 was 2.30% and the apparent real rate of wage inflation (wage increases above price inflation or CPI) in the data was 0.82%. The sum of these components equals an apparent annual rate of wage inflation of 3.12% over the five year period. The apparent rate of wage inflation is first removed from the actual rates of salary increase and the remaining rates reflect the apparent service based increases in salaries due to step increases, promotions, and educational increases. Next, we assess the current assumed rates of service based salary increases and recommend adjustments where necessary.

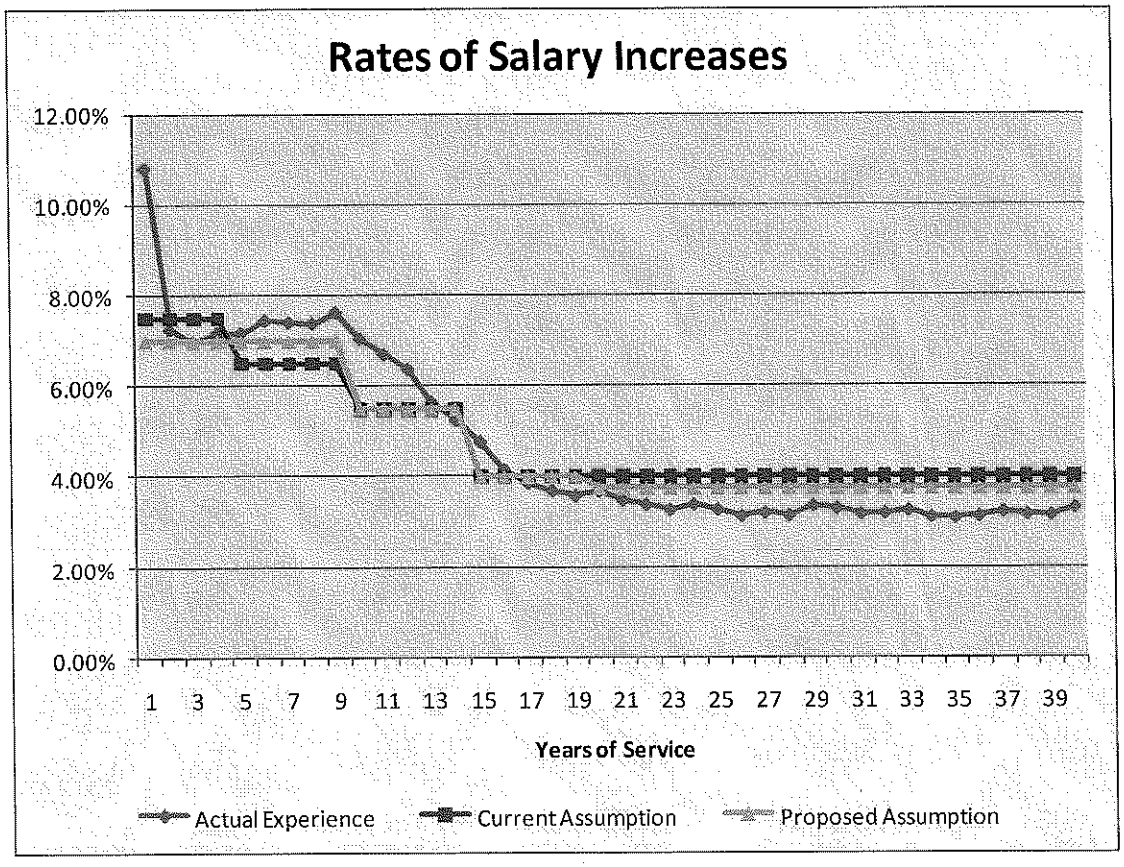
Again, the focus of this assumption is the long-term expectation and should not be significantly affected by short-term fluctuations. The actuary then combines the wage inflation assumption with the assumed rates of service based increases to produce the rates of assumed salary increases based upon years of service.

Past Experience: Total salary increases averaged 5.7% per year compared with 5.4% expected increases in salaries over the five year period. We note that the latest year of the salary experience clearly shows the most recent trend is declining rates of growth. This trend is also apparent in the latest collective bargaining agreements that we reviewed which provide additional information on the short-term future expectation of salary increases.

We note the following in review of the past experience:

1. Wage Inflation or the "across the board" rate of increase is consistently lower than the 4.0% assumed rate of increase.
2. Rates of service based increases appear more level over the first 10-years than the current assumed rates.

Section III: Demographic Assumptions



In the graph above, the lower than assumed wage inflation component of the salary increases is shown as the difference between the expected rates (red line) and the actual rates experienced (blue line) beginning around 20 years of service and beyond.

Section III: Demographic Assumptions

In the following table, we provide our analysis under the building block approach for the development of the rates of service based increases.

Years of Service	Actual Rate of Salary Increase	Apparent Service Based Increases (Actual Rate Less Apparent Wage Inflation of 3.12%)	Current Service Based Increase Assumption	Proposed Service Based Increase Assumption
1	10.79%	7.67%	3.50%	3.25%
2	7.24%	4.12%	3.50%	3.25%
3	6.98%	3.86%	3.50%	3.25%
4	7.17%	4.05%	3.50%	3.25%
5	7.18%	4.06%	2.50%	3.25%
6	7.46%	4.34%	2.50%	3.25%
7	7.41%	4.29%	2.50%	3.25%
8	7.38%	4.26%	2.50%	3.25%
9	7.63%	4.51%	2.50%	3.25%
10	7.04%	3.92%	1.50%	1.75%
11	6.70%	3.58%	1.50%	1.75%
12	6.38%	3.26%	1.50%	1.75%
13	5.65%	2.53%	1.50%	1.75%
14	5.25%	2.13%	1.50%	1.75%
15	4.78%	1.66%	0.00%	0.25%
16	4.16%	1.04%	0.00%	0.25%
17	3.86%	0.74%	0.00%	0.25%
18	3.70%	0.58%	0.00%	0.25%
19	3.58%	0.46%	0.00%	0.25%
20	3.68%	0.56%	0.00%	0.00%
21	3.48%	0.36%	0.00%	0.00%
22	3.38%	0.26%	0.00%	0.00%
23	3.27%	0.15%	0.00%	0.00%
24	3.39%	0.27%	0.00%	0.00%
25+	3.21%	0.09%	0.00%	0.00%

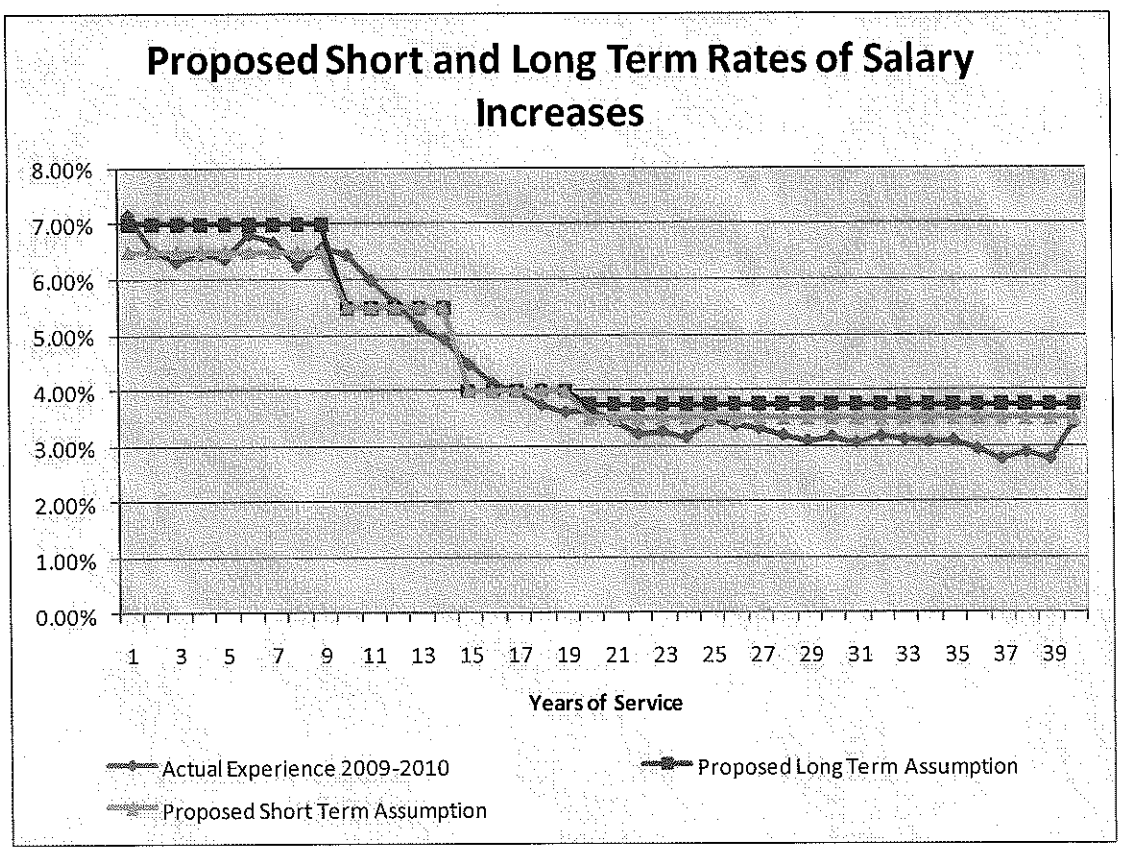
Recommendation (Long-Term): Based upon our analysis, we have recommended a 0.25% reduction in the wage inflation assumption from 4.00% to 3.75% as discussed previously in the economic assumptions. We also recommend adjustments to the assumed service based increases as provided in the table above.

Recommendation (Short-Term): In reviewing the more recent trend in the rates of salary increases along with several collective bargaining agreements, we recommend an alternate assumption for salary increases occurring from 2010 through 2012. The short-term recommendation represents a 0.50% reduction in the rates of increase for 1 to 9 years of service and a 0.25% reduction in the rates of increase for after 20 years of service.

Combining our assumption for rates of service based increases (long and short term) with the recommended wage inflation assumption produces the following table of service related salary increase rates. The table also provides a comparison of our recommendations with the current assumption.

Years of Service	Current Salary Increase Assumption	Proposed Long Term Salary Increase Assumption	Proposed Short Term Salary Increase Assumption
1-4	7.50%	7.00%	6.50%
5-9	6.50%	7.00%	6.50%
10-14	5.50%	5.50%	5.50%
15-19	4.00%	4.00%	4.00%
20-24	4.00%	3.75%	3.50%
25+	4.00%	3.75%	3.50%

The following chart compares the most recent year of salary experience with our long and short term recommended assumptions.



Other Actuarial Assumptions

Percent Married: Currently 85% of active male members and 75% of active female members are assumed to be married with the male spouse three years older than the female spouse. This is a common and reasonable assumption and we recommend maintaining this assumption.

Section IV: Actuarial Methods

Actuarial Cost Method: The cost method is used to allocate the present value of benefits between past service (actuarial accrued liability) and future service (normal cost). Currently the valuation uses the entry age normal actuarial 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. We recommend no change to the use of this method.

Actuarial Value of Assets (Smoothing): The purpose of asset smoothing is to dampen the impact that market volatility has on valuation results by spreading the unexpected market gains and losses over several years. Currently, the System uses a four-year actuarial smoothing method. In each valuation, the actuarial value of assets is determined by adjusting the expected actuarial value by 25% of the difference between the actual and expected market value of assets measured in each of the current and three prior years. The current method meets with all applicable actuarial and accounting standards.

Most large retirement systems utilize a smoothing method in determining the value of assets for valuation purposes with a five-year smoothing period being the most common and four-year smoothing being the second most common. In consideration of the recent market performance, a longer smoothing period would reduce the amount of the investment losses recognized in each year but also would be slower to recognize the gains of the markets as they recover. The real impact over time to the funding of the plan will be significantly affected by the long-term investment returns experienced compared to the return assumption and not the length of the asset smoothing period. We do not recommend a change to a longer smoothing period that is applied retroactively. A change to a longer smoothing period applied prospectively would be expected to slow down the recognition of gains experienced as the markets recover and could be expected to increase required funding in future valuations.

Amortization Method: The unfunded actuarial accrued liability (liability in excess of assets) is amortized using a level percentage of payroll method over the amortization periods prescribed by statute. The payroll growth assumption is used to determine the percentage of payroll required over the remaining amortization period to fully amortize the unfunded liability. In this study, we recommend a decrease to the annual payroll growth rate from 4.00% to 3.75% which is consistent with our recommendation for the long-term expected rate of wage inflation. It is our understanding that the length of the amortization period is defined by statute and is not within the Board's authority to change.

Appendix A: Tables of Recommended Assumptions

TABLE 1 - RATES OF WITHDRAWAL FROM ACTIVE SERVICE

Less than 10 years of service			10 or more years of service		
Years of Service	Male	Female	Age	Male	Female
0	0.140	0.120	25	0.0120	0.0350
1	0.085	0.090	26	0.0120	0.0350
2	0.055	0.070	27	0.0120	0.0350
3	0.045	0.060	28	0.0120	0.0350
4	0.035	0.055	29	0.0120	0.0350
5	0.025	0.050	30	0.0120	0.0350
6	0.024	0.045	31	0.0120	0.0350
7	0.023	0.035	32	0.0120	0.0350
8	0.022	0.030	33	0.0120	0.0350
9	0.021	0.025	34	0.0120	0.0350
			35	0.0120	0.0350
			36	0.0120	0.0350
			37	0.0120	0.0350
			38	0.0120	0.0310
			39	0.0120	0.0270
			40	0.0120	0.0230
			41	0.0120	0.0190
			42	0.0120	0.0160
			43	0.0122	0.0150
			44	0.0124	0.0140
			45	0.0126	0.0130
			46	0.0128	0.0120
			47	0.0130	0.0110
			48	0.0152	0.0115
			49	0.0174	0.0120
			50	0.0196	0.0125
			51	0.0218	0.0130
			52	0.0240	0.0130
			53	0.0252	0.0140
			54	0.0264	0.0150
			55	0.0276	0.0160
			56	0.0288	0.0170
			57	0.0300	0.0180
			58	0.0300	0.0180
			59	0.0300	0.0190

TABLE 2 - RATES OF DISABILITY WHILE IN ACTIVE SERVICE

Age	Male	Female
20	0.000455	0.00050
21	0.000455	0.00050
22	0.000455	0.00050
23	0.000455	0.00050
24	0.000455	0.00050
25	0.000455	0.00050
26	0.000455	0.00050
27	0.000455	0.00050
28	0.000455	0.00047
29	0.000455	0.00044
30	0.000455	0.00041
31	0.000455	0.00038
32	0.000455	0.00035
33	0.000455	0.00037
34	0.000455	0.00039
35	0.000455	0.00041
36	0.000455	0.00043
37	0.000455	0.00045
38	0.000520	0.00054
39	0.000650	0.00063
40	0.000715	0.00072
41	0.000845	0.00081
42	0.001040	0.00090
43	0.001170	0.00100
44	0.001430	0.00110
45	0.001625	0.00120
46	0.001820	0.00130
47	0.002015	0.00140
48	0.002340	0.00181
49	0.002730	0.00222
50	0.003250	0.00263
51	0.003900	0.00304
52	0.004615	0.00345
53	0.005330	0.00376
54	0.006175	0.00407
55	0.007150	0.00438
56	0.008320	0.00469
57	0.009490	0.00500
58	0.010790	0.00500
59	0.012805	0.00500
60	0.012805	0.00500

TABLE 3 - RATES OF RETIREMENT FROM ACTIVE SERVICE

	Normal		Proratable		Early	
Age	Male	Female	Male	Female	Male	Female
50	0.275	0.150			0.020	0.020
51	0.275	0.150			0.020	0.020
52	0.275	0.150			0.025	0.030
53	0.275	0.150			0.030	0.035
54	0.275	0.150			0.040	0.040
55	0.385	0.300			0.045	0.060
56	0.385	0.300			0.060	0.070
57	0.385	0.300			0.090	0.075
58	0.385	0.300			0.100	0.080
59	0.385	0.300			0.110	0.085
60	0.220	0.200	0.060	0.054		
61	0.253	0.225	0.060	0.072		
62	0.253	0.225	0.150	0.099		
63	0.275	0.225	0.100	0.072		
64	0.275	0.225	0.100	0.072		
65	0.363	0.300	0.200	0.135		
66	0.275	0.300	0.200	0.108		
67	0.275	0.300	0.200	0.135		
68	0.275	0.300	0.200	0.108		
69	0.275	0.300	0.350	0.108		
70	1.000	0.400	0.350	0.108		
71	1.000	0.400	0.350	0.108		
72	1.000	0.400	0.350	0.108		
73	1.000	0.400	0.350	0.108		
74	1.000	0.400	0.350	0.180		
75	1.000	0.400	0.400	0.180		
76	1.000	0.400	0.400	0.180		
77	1.000	0.400	0.400	0.180		
78	1.000	0.400	0.400	0.180		
79	1.000	0.400	0.400	0.180		
80	1.000	1.000	1.000	1.000		

TABLE 4 - RATES OF MORTALITY WHILE IN ACTIVE SERVICE

Age	Male	Female
20	0.000164	0.000108
21	0.000173	0.000107
22	0.000180	0.000106
23	0.000190	0.000104
24	0.000198	0.000105
25	0.000210	0.000109
26	0.000220	0.000113
27	0.000233	0.000119
28	0.000253	0.000128
29	0.000260	0.000133
30	0.000268	0.000140
31	0.000281	0.000148
32	0.000303	0.000164
33	0.000341	0.000198
34	0.000383	0.000225
35	0.000431	0.000249
36	0.000479	0.000269
37	0.000527	0.000289
38	0.000574	0.000307
39	0.000617	0.000324
40	0.000645	0.000343
41	0.000670	0.000365
42	0.000695	0.000397
43	0.000721	0.000436
44	0.000753	0.000479
45	0.000790	0.000527
46	0.000833	0.000579
47	0.000882	0.000620
48	0.000927	0.000662
49	0.000976	0.000704
50	0.001027	0.000761
51	0.001080	0.000824
52	0.001136	0.000907
53	0.001276	0.001022
54	0.001363	0.001158
55	0.001490	0.001316
56	0.001633	0.001502
57	0.001888	0.001749
58	0.002231	0.002067
59	0.002541	0.002372
60	0.002911	0.002675
61	0.003282	0.003029
62	0.003725	0.003447
63	0.004320	0.003965
64	0.004928	0.004539
65	0.005744	0.005215
66	0.006472	0.005877
67	0.007308	0.006618
68	0.008428	0.007469
69	0.009403	0.008294
70	0.010253	0.009168

Appendix A: Tables of Recommended Assumptions

TABLE 5 - RATES OF MORTALITY FOR RETIRED MEMBERS AND BENEFICIARIES

Age	Male	Female	Age	Male	Female
20	0.000219	0.000144	71	0.015149	0.013510
21	0.000230	0.000143	72	0.016663	0.015221
22	0.000240	0.000141	73	0.018437	0.016572
23	0.000253	0.000139	74	0.020471	0.018432
24	0.000264	0.000140	75	0.022802	0.020100
25	0.000280	0.000145	76	0.025438	0.022277
26	0.000293	0.000151	77	0.028943	0.024128
27	0.000311	0.000158	78	0.032259	0.026583
28	0.000337	0.000170	79	0.036581	0.029844
29	0.000347	0.000177	80	0.041439	0.032898
30	0.000357	0.000187	81	0.046947	0.036320
31	0.000375	0.000197	82	0.053179	0.040147
32	0.000404	0.000218	83	0.060671	0.044435
33	0.000454	0.000264	84	0.069094	0.049260
34	0.000511	0.000300	85	0.077020	0.054696
35	0.000574	0.000332	86	0.087312	0.060831
36	0.000638	0.000359	87	0.096919	0.069078
37	0.000703	0.000385	88	0.107454	0.078529
38	0.000765	0.000409	89	0.121344	0.089273
39	0.000822	0.000432	90	0.136910	0.099435
40	0.000860	0.000457	91	0.151302	0.112543
41	0.000893	0.000486	92	0.169960	0.124375
42	0.000926	0.000530	93	0.185121	0.136580
43	0.000962	0.000581	94	0.204586	0.148872
44	0.001004	0.000639	95	0.220697	0.164072
45	0.001053	0.000703	96	0.236783	0.175976
46	0.001111	0.000772	97	0.257507	0.187249
47	0.001176	0.000827	98	0.273309	0.197713
48	0.001236	0.000883	99	0.288660	0.211187
49	0.001301	0.000939	100	0.309359	0.219730
50	0.001369	0.001015	101	0.323989	0.227030
51	0.001440	0.001098	102	0.338068	0.232996
52	0.001514	0.001210	103	0.358628	0.244834
53	0.001701	0.001363	104	0.371685	0.254498
54	0.001817	0.001544	105	0.383040	0.266044
55	0.001986	0.001755	106	0.392003	0.279055
56	0.002177	0.002003	107	0.397886	0.293116
57	0.002517	0.002332	108	0.400000	0.307811
58	0.002974	0.002756	109	0.400000	0.322725
59	0.003388	0.003162	110	0.400000	0.337441
60	0.003881	0.003567	111	0.400000	0.351544
61	0.004376	0.004038	112	0.400000	0.364617
62	0.004966	0.004596	113	0.400000	0.376246
63	0.005760	0.005286	114	0.400000	0.386015
64	0.006571	0.006052	115	0.400000	0.393507
65	0.007659	0.006953	116	0.400000	0.398308
66	0.008629	0.007836	117	0.400000	0.400000
67	0.009744	0.008824	118	0.400000	0.400000
68	0.011237	0.009959	119	0.400000	0.400000
69	0.012537	0.011058	120+	1.000000	1.000000
70	0.013671	0.012224			

TABLE 6 - RATES OF MORTALITY FOR DISABILITY MEMBERS

Age	Male	Female	Age	Male	Female
25	0.000574	0.000332	68	0.032259	0.026583
26	0.000638	0.000359	69	0.036581	0.029844
27	0.000703	0.000385	70	0.041439	0.032898
28	0.000765	0.000409	71	0.046947	0.036320
29	0.000822	0.000432	72	0.053179	0.040147
30	0.000860	0.000457	73	0.060671	0.044435
31	0.000893	0.000486	74	0.069094	0.049260
32	0.000926	0.000530	75	0.077020	0.054696
33	0.000962	0.000581	76	0.087312	0.060831
34	0.001004	0.000639	77	0.096919	0.069078
35	0.001053	0.000703	78	0.107454	0.078529
36	0.001111	0.000772	79	0.121344	0.089273
37	0.001176	0.000827	80	0.136910	0.099435
38	0.001236	0.000883	81	0.151302	0.112543
39	0.001301	0.000939	82	0.169960	0.124375
40	0.001369	0.001015	83	0.185121	0.136580
41	0.001440	0.001098	84	0.204586	0.148872
42	0.001514	0.001210	85	0.220697	0.164072
43	0.001701	0.001363	86	0.236783	0.175976
44	0.001817	0.001544	87	0.257507	0.187249
45	0.001986	0.001755	88	0.273309	0.197713
46	0.002177	0.002003	89	0.288660	0.211187
47	0.002517	0.002332	90	0.309359	0.219730
48	0.002974	0.002756	91	0.323989	0.227030
49	0.003388	0.003162	92	0.338068	0.232996
50	0.003881	0.003567	93	0.358628	0.244834
51	0.004376	0.004038	94	0.371685	0.254498
52	0.004966	0.004596	95	0.383040	0.266044
53	0.005760	0.005286	96	0.392003	0.279055
54	0.006571	0.006052	97	0.397886	0.293116
55	0.007659	0.006953	98	0.400000	0.307811
56	0.008629	0.007836	99	0.400000	0.322725
57	0.009744	0.008824	100	0.400000	0.337441
58	0.011237	0.009959	101	0.400000	0.351544
59	0.012537	0.011058	102	0.400000	0.364617
60	0.013671	0.012224	103	0.400000	0.376246
61	0.015149	0.013510	104	0.400000	0.386015
62	0.016663	0.015221	105	0.400000	0.393507
63	0.018437	0.016572	106	0.400000	0.398308
64	0.020471	0.018432	107	0.400000	0.400000
65	0.022802	0.020100	108	0.400000	0.400000
66	0.025438	0.022277	109	0.400000	0.400000
67	0.028943	0.024128	110	1.000000	1.000000

Appendix A: Tables of Recommended Assumptions

TABLE 7 - RATES OF SALARY INCREASES

Years of Service	2010 - 2011 & 2011 - 2012	2012 – 2013 & After
0	0.0650	0.0700
1	0.0650	0.0700
2	0.0650	0.0700
3	0.0650	0.0700
4	0.0650	0.0700
5	0.0650	0.0700
6	0.0650	0.0700
7	0.0650	0.0700
8	0.0650	0.0700
9	0.0650	0.0700
10	0.0550	0.0550
11	0.0550	0.0550
12	0.0550	0.0550
13	0.0550	0.0550
14	0.0550	0.0550
15	0.0400	0.0400
16	0.0400	0.0400
17	0.0400	0.0400
18	0.0400	0.0400
19	0.0400	0.0400
20+	0.0350	0.0375