Seattle City Employees' Retirement System

Investigation of Experience

January 1, 2007 through December 31, 2010

June 1, 2011

By

Nick J. Collier

Associate, Society of Actuaries
Enrolled Actuary
Member, American Academy of Actuaries

June 1, 2011

Retirement Board
Seattle City Employees' Retirement System
720 Third Avenue, Suite 1000
Seattle, WA 98104

Dear Members of the Board:

It is a pleasure to submit this report of our investigation of the experience of the Seattle City Employees' Retirement System for the period January 1, 2007 through December 31, 2010. The results of this investigation are the basis for recommended changes in actuarial assumptions for the actuarial valuation to be performed as of January 1, 2011. Note that this report covers both the assumptions for active members and retired members.

The purpose of this report is to communicate the results of our review of the actuarial methods and the economic and demographic assumptions to be used in the completion of the upcoming valuation. Several of our recommendations represent changes from the prior methods or assumptions and are designed to better anticipate the emerging experience of the System.

We have provided financial information showing the estimated impact of the recommended assumptions, if they had been reflected in the January 1, 2010 actuarial valuation. We believe the recommended assumptions provide a reasonable estimate of anticipated experience affecting SCERS. Nevertheless, the emerging costs will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as the following:

- Plan experience differing from the actuarial assumptions,
- Future changes in the actuarial assumptions,
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as potential additional contribution requirements due to changes in the plan's funded status), and
- Changes in the plan provisions or accounting standards.

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

In preparing this report, we relied without audit on information (some oral and some in writing) supplied by SCERS' staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We used SCERS' benefit provisions as stated in our January 1, 2010 Actuarial Valuation report. In our examination, after discussion with SCERS

and certain adjustments, we have found the data to be reasonably consistent and comparable with data used for other purposes. Since the experience study results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our determinations might need to be revised.

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The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices.

We would like to acknowledge the help in the preparation of the data for this investigation given by the SCERS staff. We look forward to our discussions and the opportunity to respond to your questions and comments at your next meeting.

I, Nick Collier, am a member of the American Academy of Actuaries and an Associate of the Society of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Nick J. Collier, ASA, EA, MAAA
Principal and Consulting Actuary
NJC/nlo

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

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Investigation of Experience (2007-2010)

Section 1:   Executive Summary

Actuarial valuations are based on certain underlying assumptions. Determining the adequacy of the contribution rate is highly dependent on these assumptions that the actuary uses to project the future benefit payments and then to discount the value of future benefits to determine the present values. Thus, the assumptions are critical in assisting the system in adequately pre-funding the benefits prior to retirement.

Overview

To assess the reasonableness of the assumptions used in the valuation, they should be studied regularly. This process is called an investigation of experience (or experience study).

Summary of Results

This section describes the key findings of this investigation of experience of the Seattle City Employees' Retirement System for the period January 1, 2007 through December 31, 2010. We are recommending several changes to the demographic assumptions. We are proposing that the current economic assumptions remain unchanged.

It should be noted this experience study covers a four-year period with some very turbulent economic conditions. We believe this was a factor in some of the results we observed. Accordingly, in many instances we recommended smaller changes than we otherwise would have based on the experience.

The following table shows a summary of the results of the study.

Assumption	Proposed Change
Inflation	No Change
Investment Return	No Change
Wage Growth	No Change
Admin. Expenses	No Change
Merit Salary Scale	Reduce rates at lower service levels
Death while Active	Reduce rates
Retirement	Reduce rates
Disability	Reduce rates
Retired Mortality	No Change
Termination	Reduce rates at lower service levels
Probability of Refund	Reduce rates

Summary (continued)

If adopted, the new assumptions would result in a small decrease in the total contribution rate required to pay off the Unfunded Actuarial Accrued Liability (UAAL) over a 30-year period, and would result in a slight increase in the Funded Ratio of the system.   This is discussed further in the Financial Impact section at the end of the Executive Summary. Some additional scenarios were studied and the impact is discussed at the end of this section.

Economic Assumptions

Section 2 discusses the economic assumptions: price inflation, general wage growth (includes price inflation and productivity) and the investment return assumption. We have proposed that the Board retain the current economic assumptions.

Note that we are making recommendations for changes to demographic assumptions based on tangible evidence to back up those recommendations. On the other hand, the economic assumptions tend to be more subjective; we have proposed no changes to these assumptions, but have analyzed some alternatives for the Board's consideration.

We also reviewed the possibility of including an active membership growth assumption, but have not proposed a change in this assumption (currently 0%). Using an active membership growth assumption is uncommon and does not comply with GASB parameters. However, if the Board felt that the adoption of such an assumption would be appropriate, we believe a moderate increase would be reasonable.

Individual Salary Increases Due to Promotion and Longevity (Merit)

Section 3 discusses the individual salary increases due to promotion and longevity – the merit component of salaries. Overall, the results of our salary study show increases somewhat less than the current rates predicted. We are recommending lower rates of salary increase during the earlier portion of a member's career.

Death While Active

Overall, the actual number of deaths from active status was smaller than the current assumptions predicted. This is indicated by an actual-to-expected ratio of 72%. That is, there were 28% fewer active deaths than the current assumptions would have predicted).

We are recommending an additional setback to the current tables to better reflect experience. By increasing the setback, this reduces the probability of mortality.

Deaths while Active					
Gender	Actual	Expected	Act / Exp	Proposed	Act / Prop
Male	27	39	69%	31	87%
Female	20	26	77%	20	100%
Total	47	65	72%	51	92%

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Service Retirement

Overall, the actual number of service retirements was less than the assumptions predicted, in particular for unreduced retirement. The following graph shows the results for all members eligible for unreduced retirement in aggregate.
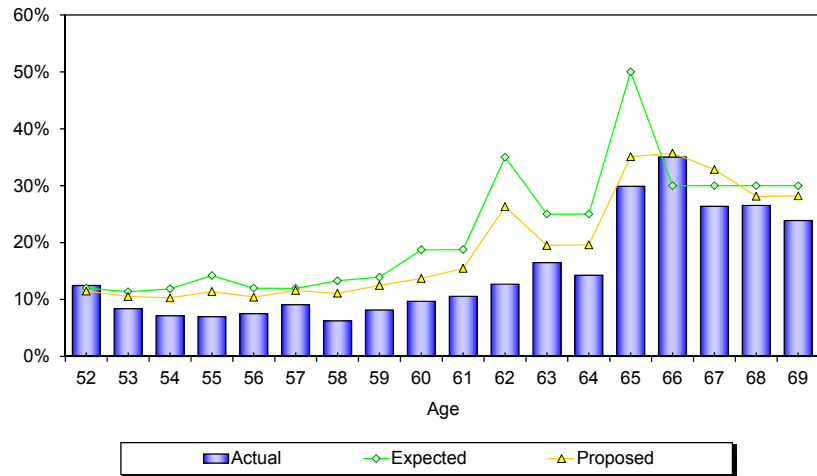
We are recommending minor changes to the rates of retirement with reduced benefits. For unreduced retirement, we are recommending larger changes, as shown in the previous graph.

Disability Retirement

Over the four-year study period, there were three disability retirements compared to 12 expected. We are recommending lower rates of disability to partially reflect the actual experience.

Termination

Overall, the actual number of terminations was substantially lower than what the assumptions predicted. We are recommending revised rates to reflect this as shown in the following graph (males and females combined).
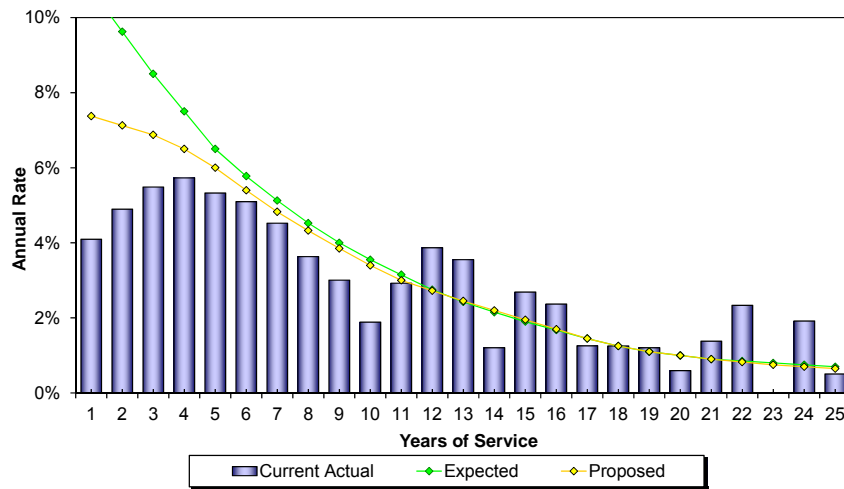
Probability of Refund upon Vested Termination

The actual number of refunds for vested members at termination was less than the assumptions predicted for members with less than 20 years of service. For the group with 20 years of service or more, there was not a significant statistical difference. We are recommending lowering the rates of refund at termination for members with less than 20 years of service, as shown below.

Probability of Refund					
Service	Actual	Expected	Act / Exp	Proposed	Act / Prop
Less than 20 Years	203	240	85%	218	93%
20 Years or More	5	4	125%	4	125%

Financial Impact of Recommended Assumptions

Overall, the estimated financial impact of the proposed changes in assumptions is somewhat small, as compared to the total liabilities. The following exhibit is designed to give the reader an idea of how the proposed changes would affect SCERS as a whole. The proposed changes decrease the expected annual cost of benefits (Normal Cost %), and improve the Funded Ratio slightly. Additionally, the total contribution rate necessary to amortize the UAAL also decreases.

The financial impact was evaluated by performing additional valuations with the January 1, 2010 valuation data and reflecting the proposed assumption changes. This allows us to assess the relative financial impact of the various proposed changes. Note that the relative impact of the various assumption changes by component is somewhat dependent on the order in which they are evaluated.

Note that these are just estimates of the relative impact of specific changes. The actual January 1, 2011 valuation results will vary due to actuarial experience during the period such as the change in payroll and the actual investment return.

	Total Contribution To Amortize UAAL Over 30 Years	Funded Ratio
January 1, 2010 Valuation	**25.03%**	**62.0%**
Demographic Assumptions		
Termination Rates/Probability of Refund	0.15%	0.1%
Rates of Retirement	-0.37%	0.6%
Rates of Active Death/Disability	0.01%	0.0%
Merit Salary	-0.11%	0.0%
Subtotal Demographic Change	-0.32%	0.6%
Economic Changes		
No Changes Proposed	0.00%	0.0%
Combined Change	**-0.32%**	**0.6%**
January 1, 2010 Valuation with Changes	**24.71%**	**62.6%**

The January 1, 2010 Normal Cost Rate after reflecting all proposed changes is 15.17%, as compared to 15.23% in the January 1, 2010 valuation.

Financial Impact of Other Potential Changes

We were requested to look at some additional changes in the assumptions and methods used in the valuation. These are discussed in more detail later in the report. The estimated financial impact of these changes is shown below. In addition, we have shown the estimated financial impact of ¼% changes in some of the key economic assumptions.

As with the proposed assumptions, the costs illustrated in the table below are based on the January 1, 2010 actuarial valuation and include the recommended demographic changes. Each of the changes is measured in isolation. That is, the impact shown assumes it is the only change.

Change in Key Measurements[1]		
	Total Contribution To Amortize UAAL Over 30 Years	Funded Ratio
Member Account Crediting		
4% Credit	-1.56%	0.8%
5% Credit	-0.99%	0.4%
Active Membership Growth Assumption		
0.5% Annual Increase	-0.58%	0.0%
1.0% Annual Increase	-1.16%	0.0%
1.5% Annual Increase	-1.68%	0.0%
Economic Changes[2]		
0.25% Decrease in Wage Growth	0.05%	0.2%
0.25% Decrease in Inflation and Investment Return	0.98%	-1.3%
5-Year Asset Smoothing (Retro to 2008)[3]	-4.49%	17.5%
Fixed-Dollar Amortization of UAAL[4]	5.22%	-4.6%

Notes:

(1) All estimated results are in isolation. That is, if a 4% member crediting rate were adopted, the total change in Funded Ratio would be 0.8%. It would not be the sum of the change to 5% and the change to 4%.

(2) Estimates are based on decreases. 1/4% increases would have roughly the same impact in the opposite direction.

(3) The 5-year asset smoothing assumes that method is applied based on a 1/1/2008 effective date. Note that the impact will be much less as of 1/1/2011 as more of the 2008 loss is recognized.

(4) Assumes cost method used is level-dollar entry age normal cost.

It should be noted that if a new investment return assumption is adopted by the Board, it will impact the factors used in the calculation of member benefits under optional forms of payment. Additionally, the investment return assumption affects the calculation of the minimum benefit, which is equal to twice the member contributions with interest converted to a monthly annuity. A decrease in the investment return assumption or interest crediting rate would reduce the monthly annuities paid under this formula.

Section 2:   Economic Assumptions

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans. 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. These estimates are based on a mixture of past experience, future expectations, and professional judgment. 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.

Recognizing that there is not one "right answer", the standard calls for the actuary to develop a best estimate range for each economic assumption, and then recommend a specific point within that range. 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.

This section will discuss the economic assumptions. In brief, they are as follows. Additional alternatives are discussed later in this section:

Economic Assumption	Current Assumption (Annual Rate)	Proposed (Annual Rate)
Consumer Price Inflation	3.50%	No Change
Investment Return[1]	7.75%	No Change
Investment Expenses	0.25%	No Change
Administrative Expenses	0.40%	No Change
Wage Growth (includes inflation and productivity)	4.00%	No Change
Real Wage Inflation (wage growth less price inflation)	0.50%	No Change
Payroll Growth	Assumed to be the same as Wage Growth	

[1] *Net of investment expenses.*

1. Consumer Price Inflation

Use in the Valuation

When we refer to inflation in this report, we are referring to price inflation. The inflation assumption has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, general wage increases and the payroll increase assumption. It also has a direct impact on the valuation results as it will be used to determine the expected floor COLA payment.

The long-term relationship between inflation and investment return has long been recognized by economists. The basic principle is that the investors demand a "real return" – the excess of actual investment returns over inflation. If inflation rates are expected to be high, investors will demand expected investment returns that are also expected to be high enough to exceed inflation, while lower inflation rates will result in lower demanded expected investment returns, at least in the long run.

The current assumption for inflation is 3.50% per year.

Historical Perspective

The data for inflation shown below is based on the national Consumer Price Index, US City Average, All Urban Consumers (CPI-U) as published by the Bureau of Labor Statistics. The data for periods ending in December of each year is documented in Exhibit 1 at the end of this section.

Although economic activities in general, and inflation in particular, do not lend themselves to prediction on the basis of historical analysis, historical patterns and-long term trends are a factor to be considered in developing the inflation assumption.

There are numerous ways to review historical data, with significantly differing results. The tables below show the compounded annual inflation rate for various 10-year periods, and for longer periods ended in December 2010.

Decade	CPI Increase
2001-2010	2.5%
1991-2000	2.9%
1981-1990	5.1%
1971-1980	7.4%
1961-1970	2.5%
Prior 75 Years	
1936-2010	3.8%

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Historical Perspective (continued)

The following graph shows historical national CPI increases. Note that the actual CPI increase has been less than 3.50% for all but one of the last 20 years.

Historical CPI-U
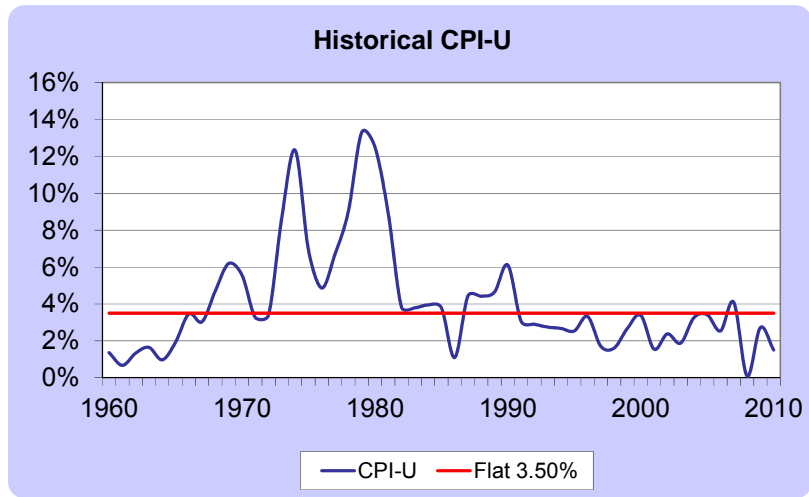
Peer System Comparison

According to the *Public Fund Survey* (a survey of approximately 100 statewide systems), the average inflation assumption for statewide systems has been steadily declining. As of the most recent study, the two most common assumptions are 3.00% and 3.50%.

Looking at SCERS' peer systems (major cities in the western US), the current inflation assumption is the most common, although other systems have been lowering this assumption and 3.50% is now on the high end.

Price Inflation Assumption

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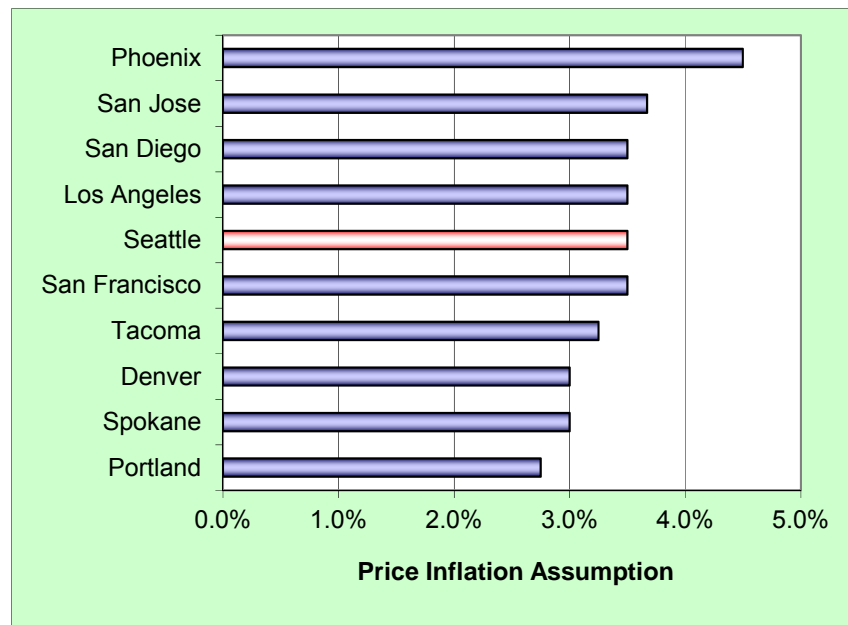
Forecasts of Inflation

Since the U.S. Treasury started issuing inflation indexed bonds, it is possible to determine the approximate rate of inflation anticipated by the financial markets by comparing the yields on inflation indexed bonds with traditional fixed government bonds. Current market prices as of May 2011 suggest investors expect inflation to be about 2.5% over the next 30 years. This rate is close to the amount (2.75%) forecast by Pension Consulting Alliance in their 2010 asset allocation study performed for SCERS.

Many economists have been forecasting inflation lower than the current assumption of 3.50% for several years. Economists are generally considering shorter time periods (10 years or less) than may be appropriate for a pension valuation. To find an economic forecast with a time frame long enough to suit our purposes, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the 2010 Trustees Report, the projected average annual increase in the CPI over the next 75 years under the intermediate cost assumptions was 2.80%. The reasonable range was stated as 1.80% to 3.80%.

Best Estimate Range and Recommendation

The consumer price inflation assumption impacts SCERS' funding as it is used to project the Floor COLA payments. It is also used to determine both the investment return assumption and the wage growth assumptions. We believe that the current assumption of 3.50% per year is somewhat on the high side, although we believe it is still reasonable and are proposing no change be made. Given the future expectations of inflation, the Board might consider lowering the assumption. If the assumption were lowered, we would recommend consideration be given to a corresponding decrease in the general wage growth and investment return assumptions.

CONSUMER PRICE INFLATION	
Current Assumption	3.50%
Best Estimate Range	2.00% - 3.75%
Proposed Assumption	3.50%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 2-1

US City Average, All Urban Consumers (CPI-U) - December

December of:	INDEX	INCREASE	December of:	Index	Increase
1928	17.1		1969	37.7	6.2%
1929	17.2	0.6%	1970	39.8	5.6
1930	16.1	-6.4	1971	41.1	3.3
1931	14.6	-9.3	1972	42.5	3.4
1932	13.1	-10.3	1973	46.2	8.7
1933	13.2	0.8	1974	51.9	12.3
1934	13.4	1.5	1975	55.5	6.9
1935	13.8	3.0	1976	58.2	4.9
1936	14.0	1.4	1977	62.1	6.7
1937	14.4	2.9	1978	67.7	9.0
1938	14.0	-2.8	1979	76.7	13.3
1939	14.0	0.0	1980	86.3	12.5
1940	14.1	0.7	1981	94.0	8.9
1941	15.5	9.9	1982	97.6	3.8
1942	16.9	9.0	1983	101.3	3.8
1943	17.4	3.0	1984	105.3	3.9
1944	17.8	2.3	1985	109.3	3.8
1945	18.2	2.2	1986	110.5	1.1
1946	21.5	18.1	1987	115.4	4.4
1947	23.4	8.8	1988	120.5	4.4
1948	24.1	3.0	1989	126.1	4.6
1949	23.6	-2.1	1990	133.8	6.1
1950	25.0	5.9	1991	137.9	3.1
1951	26.5	6.0	1992	141.9	2.9
1952	26.7	0.8	1993	145.8	2.7
1953	26.9	0.7	1994	149.7	2.7
1954	26.7	-0.7	1995	153.5	2.5
1955	26.8	0.4	1996	158.6	3.3
1956	27.6	3.0	1997	161.3	1.7
1957	28.4	2.9	1998	163.9	1.6
1958	28.9	1.8	1999	168.3	2.7
1959	29.4	1.7	2000	174.0	3.4
1960	29.8	1.4	2001	176.7	1.6
1961	30.0	0.7	2002	180.9	2.4
1962	30.4	1.3	2003	184.3	1.9
1963	30.9	1.6	2004	190.3	3.3
1964	31.2	1.0	2005	196.8	3.4
1965	31.8	1.9	2006	201.8	2.5
1966	32.9	3.5	2007	210.0	4.1
1967	33.9	3.0	2008	210.2	0.1
1968	35.5	4.7	2009	215.9	2.7
			2010	219.2	1.5

2. Wage Growth

Use in the Valuation

Estimates of future salaries are based on two types of assumptions: 1) general wage increase and 2) merit increase. Rates of increase in the general wage level of the membership are directly related to inflation, while individual salary increases due to promotion and longevity occur even in the absence of inflation. The promotion and longevity assumptions, referred to as the merit scale, will be reviewed with the other demographic assumptions.

The current assumption is for 0.50% wage growth above the inflation assumption.

Historical Perspective

We have used statistics from the Social Security Administration on the National Average Wage back to 1951. For years prior to 1951, we studied the Total Private Nonagricultural Wages as published in *Historical Statistics of the U.S., Colonial Times to 1970.*

There are numerous ways to review this data. For consistency with our observations of other indices, the table below shows the compounded annual rates of wage growth for various 10-year periods. The excess of wage growth over price inflation represents "productivity" or the increase in the standard of living, (also called the real wage inflation rate).

Decade	Wage Growth	CPI Increase	Real Wage Inflation
2001-2010	2.6%	2.5%	0.1%
1991-2000	4.3%	2.9%	1.4%
1981-1990	5.3%	5.1%	0.2%
1971-1980	7.3%	7.4%	-0.1%
1961-1970	4.4%	2.5%	1.9%
Prior 75 Years			
1936-2010	5.3%	3.8%	1.5%

Peer System Comparison

The *Public Fund Survey* does not report the average wage growth assumption. Based on our experience with other systems, we believe the average for this group would be approximately equal to SCERS' assumption of 4.0%.

Looking at SCERS' peer systems (major cities in the western United States), the current wage growth assumption is in the mainstream.
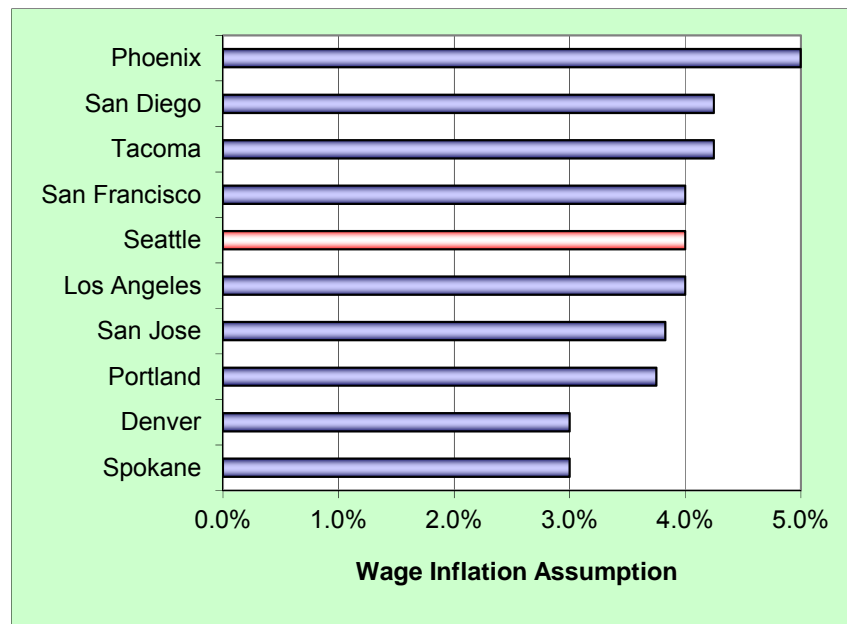
Forecasts of Future Wages

Wage inflation has been projected by the Office of the Chief Actuary of the Social Security Administration. In the 2010 Trustees Report, the long-term annual increase in the National Average Wage is estimated to be 1.2% higher than the Social Security intermediate inflation assumption of 2.8% per year. The range of the assumed real wage growth in the 2010 Trustees Report was from 0.8% to 1.8% per year.

Reasonable Range and Recommendation

We believe that a range between 0.25% and 1.25% is reasonable for the actuarial valuation. Real wage inflation rate in recent years has been very low or negative; however, in the long term it has significantly exceeded SCERS' current assumption of 0.50%. We believe future real-wage inflation will remain lower than the long-term average and are proposing no change in the assumption.

REAL WAGE INFLATION RATE	
Current Assumption	0.50%
Best Estimate Range	0.25% - 1.25%
Proposed Assumption	0.50%

Reasonable Range and Recommendation (continued)

The wage growth assumption is the total of the consumer price inflation assumption and the real wage inflation rate. If the real wage inflation assumption remains 0.50% and the price inflation assumption remains at 3.50%, this would result in a total wage growth assumption of 4.00%.

Payroll Increase Assumption

In addition to setting salary assumptions for individual members, the aggregate payroll of SCERS is expected to increase, without accounting for the possibility of an increase in membership (our current and proposed assumption is that no growth in membership is assumed).

The current payroll increase assumption is equal to the general wage growth assumption of 4.00%. We are proposing that the payroll increase assumption remain at 4.0% if the inflation rate remains at 3.50%.

We were requested to review the assumption for growth in active membership (currently 0.0%). This is discussed at the end of this section.

3. Investment Return

Use in the Valuation

The investment return assumption is one of the primary determinants in the calculation of the expected cost of the System's benefits, providing a discount of the future benefit payments that reflects the time value of money.   This assumption has a direct impact on the calculation of liabilities, normal costs, member contribution rates, and the factors for optional forms of benefits. The current investment return assumption for SCERS is 7.75% per year, net of investment-related expenses.

Method to Determine Best-Estimate Range for Investment Return

We have determined the best-estimate range for the investment return assumption based upon a model developed by Milliman's investment practice. As input to this model, we have used the average capital market assumptions of a number of investment consultants and the target asset allocation adopted by the SCERS Board. SCERS' ultimate target asset allocation, along with the capital market assumptions used, are summarized in the following chart:

Class	Target Allocation	Nominal Return	Standard Deviation
US Equity	25%	9.2%	17.4%
Non-US Equity	27%	9.4%	19.3%
Covered Calls	6%	8.2%	13.1%
US Fixed Income	20%	4.0%	5.2%
Real Return	4%	7.3%	9.3%
Private Equity	6%	13.5%	28.7%
Real Estate	12%	7.7%	12.5%

This model is used to provide the range of assumptions appropriate for compliance with Actuarial Standard of Practice No. 27, "Selection of Economic Assumptions for Measuring Pension Obligations." The Standard defines the Best-Estimate Range as "the narrowest range within which the actuary reasonably anticipates that the actual results, compounded over the measurement period, are more likely than not to fall."

By assuming the portfolio is re-balanced annually and that annual returns are lognormally distributed and independent from year-to-year, we can develop expected percentiles for the long-term distribution of annualized returns.

Using properties of the lognormal distribution, we calculate the 25th and 75th percentiles of the long-term total return distribution. This becomes our best-estimate range because 50% of the outcomes are expected to fall within this range and it is centered about the mean.

Method to Determine Best-Estimate Range for Investment Return (continued)

The capital market assumptions were combined with the target asset allocation policy to generate expected returns. These rates of return are subject to significant year-to-year volatility as measured by the standard deviation. Volatility over time will lower the mean real rate of return, but diversification by asset class will reduce the volatility and narrow the range of expected total returns for the entire portfolio. The results are summarized as follows:

Expected Investment Return based on Capital Market Assumptions
(before reflecting investment expenses or inflation adjustment)

Horizon	Percentile Results for Nominal Rate of Return				
In Years	95th	75th	50th	25th	5th
1	-10.2%	-0.1%	7.5%	15.6%	28.5%
5	-0.8%	4.0%	7.5%	11.0%	16.4%
10	1.5%	5.0%	7.5%	10.0%	13.7%
20	3.2%	5.7%	7.5%	9.2%	11.8%
30	**4.0%**	**6.0%**	**7.5%**	**8.9%**	**11.0%**

The geometric mean return prior to any subsequently discussed adjustment is 7.5%, but due to the volatility associated with the asset allocation, the range of probable outcomes is quite large. For example, in the first year there is a 5% chance the rate of return will be less than -10.2% and a 5% chance it will be greater than 28.5%. As the time horizon lengthens, the range of the cumulative average results narrows. Note that these are gross returns, prior to adjusting for investment expenses.

Over a 30-year time horizon, we estimate there is a 25% chance the nominal rate of return will be less than 6.0% and a 25% chance the return will be greater than 8.9% (bold numbers on the bottom line in the table above). Therefore, we can say the return is just as likely to be within the range from 6.0% to 8.9% as not.

Investment-Related Expenses

The investment return used for the valuation is assumed to be net of all investment-related expenses. The following table shows the ratio of investment expenses to the fair market value of SCERS assets over the last eight fiscal years ending December 31. The expense ratio is calculated as the total expense divided by the ending asset balance at fair market value.

($million) Year	Market Assets	Inv. Expense	Expense Ratio
2003	$1,255.0	$3.67	0.29%
2004	$1,578.0	$3.21	0.20
2005	$1,684.0	$3.88	0.23
2006	$1,792.0	$3.73	0.21
2007	$2,011.0	$4.20	0.21
2008	$2,010.7	$3.37	0.17
2009	$1,565.6	$3.37	0.22
2010	$1,753.2	$4.53	0.26

The total expense ratio for the last several years had averaged close to the current assumption of 0.25%. Therefore, we are proposing the annual investment expense assumption remain at 0.25% of assets.

This assumption does not have a direct impact on the actuarial valuation results, but it does provide a measure of gross return on investments that will be needed to meet the actuarial assumption used for the valuation. For example, if the investment return assumption is set equal to 7.75%, then SCERS would need to earn a gross return on its assets of 8.00% in order to net the 7.75% for funding purposes.

Administrative Expenses

Future administrative expenses are recognized in the normal cost rate. The expected dollar amount is expressed as a percent of payroll. Based on the last 10 years, the administrative expenses have been:

($million) Year	Covered Payroll	Admin. Expense	Expense Ratio
2000	$384	$1.30	0.34%
2001	405	1.45	0.36
2002	455	1.75	0.38
2003	425	1.84	0.43
2004	457	1.76	0.39
2005	447	2.00	0.45
2006	473	1.84	0.39
2007	500	1.83	0.37
2008	572	2.04	0.36
2009	581	2.42	0.42

Administrative Expenses (continued)	The ratio of administrative expenses to covered payroll has been close to the assumed 0.40% over the last 10 years. Therefore, we are not proposing a change.

Adjustments to the Best-Estimate Range

The previous analysis of the investment return reflected only the expected capital market assumptions and SCERS' target asset allocation. Two other factors should be considered in setting the investment return assumption: 1) investment-related expenses; and 2) the valuation inflation assumption. The adjustments for these factors as discussed below.

Investment Expenses

Under ASOP 27, "investment expenses expected to be paid from plan assets may be reflected by a reduction in the investment return assumption." For purposes of this analysis, we have shown a full reduction for the expected investment expenses.

Valuation Inflation Assumption

Another requirement of ASOP 27 is consistency between assumptions. Since the investment consultants use a lower inflation assumption than is used in the valuation, we must consider the impact of this difference.

In theory, higher inflation leads to higher nominal returns in the long term. Investors demand a "real return" – the excess of actual investment returns over inflation. If inflation rates are expected to be high, investors will demand expected investment returns that are also expected to be high enough to exceed inflation, while lower inflation rates will result in lower demanded expected investment returns, at least in the long run.

At least in the short term, higher inflation tends to have a negative impact on returns. For example, it will tend to reduce the value of bonds. Additionally, investment consultants calculate their expected returns for stocks based on a specific inflation; changing the inflation assumption would likely impact their analysis.

In setting the reasonable range for the investment return assumption, we have used the valuation assumption (3.5%) which is 1.0% higher than the average of the five investment consultants (2.5%). Note that the valuation assumption is based on a longer time horizon than the capital market assumptions, which tend to be 10-year forecasts. We feel some adjustment is appropriate, but reflecting a full increase of 1.0% in the best-estimate range is probably aggressive. For consistency between assumptions, we have shown this full adjustment. Therefore, consideration should be given to picking a below-median investment return assumption.

Best Estimate Range and Recommendations Based on Current Market Expectations

Based on the ASOP No. 27 guidelines, we conclude that the reasonable range is the expected real rates of return between the 25th and 75th percentile projected out 30 years, plus the assumed inflation rate, less investment-related expenses.

Based upon our model and the current inflation assumption, we have the following results:

Components of Return	Percentile Results		
	75th	50th	25th
Expected Nominal Rate of Return	6.0%	7.5%	8.9%
Capital Market Inflation	-2.5%	-2.5%	-2.5%
Valuation Inflation	3.5%	3.5%	3.5%
Investment Expenses	-0.3%	-0.3%	-0.3%
Net Expected Return	**6.7%**	**8.2%**	**9.6%**

Peer System Comparison

According to the *Public Fund Survey*, the average investment return assumption for statewide systems has been slowly declining. As of the most recent study, the average rate is just under 8.0%

Looking at SCERS' peer systems (major cities in the western United States), the current investment return assumption is also in the mainstream.

Wage Inflation Assumption
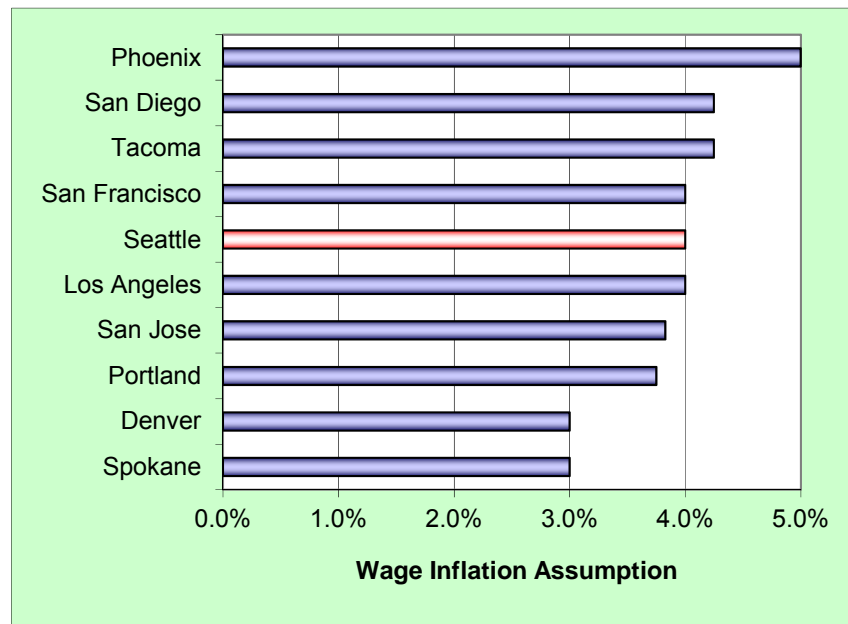
Other Factors for Board consideration

Since economic assumptions are subjective in nature, it is our recommendation that the Board be fully comfortable with the implications of the economic assumptions, particularly with the investment return assumption. There is an "actuarial risk" associated with the economic assumptions, the same as there is an investment risk associated with a given portfolio mix.

Actuarial assumptions are used to measure and budget future costs. Changing assumptions will not change the actual cost of future benefits. Aggressive assumptions anticipate good future experience ahead of time and factor it into budget estimates. Conservative assumptions, on the other hand, tend to recognize good experience only after it happens.

The choice of assumptions depends on a system's risk tolerance. The final determination on whether or not a set of assumptions was either conservative or aggressive will only be borne out by future experience.

It should also be noted that the investment return assumption is used in the calculation of option factors, service purchases, and the minimum benefit based on the value of twice the member contributions. If the investment return is changed and the change is reflected in these factors, this could either increase or decrease the member's (and consequently the City's) ultimate cost.

Conclusion

Based on SCERS' target asset allocation, we believe the 7.75% assumption is reasonable. Nonetheless, the expected returns for the portfolio will still have a certain amount of volatility.

Note that although the current Actuarial Standards of Practice allow us to recommend any point within the best-estimate range, this does not mean that we consider any point within the range reasonable.

INVESTMENT RETURN (NET OF INVESTMENT EXPENSES)	
Current Assumption	7.75%
Best Estimate Range	6.7% - 9.6%
Proposed Assumption	7.75%

4. Active Membership Growth

Use in the Valuation   The membership growth assumption does not impact the actuarial accrued liability, the UAAL, or the normal cost rate. However, it does impact our calculation of the required contribution rate to finance the UAAL. This is because it is a component of the payroll increase assumption. The current assumption is that the active population remains stable.

Accounting   The Government Accounting Standards Board (GASB) does not allow for a non-zero membership growth assumption in the calculation of the Annual Required Contribution (ARC) for plans that fund on a level percentage of pay basis. Therefore, if SCERS was to adopt an increase in the active membership growth assumption, this would create "two sets of books." That is, separate funding and accounting numbers would be reported.

Historical Perspective   Going back to 1948, active membership in SCERS has increased 1.2% per year on average.

Comments   Very few public retirement systems have a non-zero active membership growth assumption. This is undoubtedly influenced by the GASB reporting requirements.

If a positive growth in active membership is assumed and there is not future growth, this will push costs off in to the future (all other things being equal). Conversely, if no growth in active membership is assumed and there is future growth, this will push savings off into the future.

We believe the current approach is reasonable. If SCERS was to adopt an active membership growth assumption, this would impact the projected funding needed (as reflected in the total contribution rate required to amortize the UAAL over 30 years), but not the Funded Ratio. Estimated costs under several alternatives are shown in Section 1.

Section 3: Salary Increases Due to Promotion and Longevity (Merit)

Estimates of future salaries are based on assumptions for two types of increases:

1) Increases in each individual's salary due to promotion or longevity, which occur even in the absence of inflation (merit increases); and

2) Increases in the general wage level of the membership, which are directly related to inflation and increases in productivity.

Results

In Section 2 we propose that the second of these rates, the general wage inflation, remain at 4.00%.

Exhibit 3-1 shows the actual merit increases over the four-year study period. Also shown on this exhibit are the actual merit increases from the previous experience study. Increases were higher earlier in a member's career (lower service) and then decreased over time, consistent with the current assumptions; however, the actual increases were somewhat lower than the increases expected by the assumptions.

Recommendation

We are recommending reduced rates of salary increase in the earlier years of employment, to reflect the lower-than-expected experience. It has been our observation that there is significant variability in merit increases from one study to the next, and we do not want to give undue weight to recent experience. However, because lower than expected salary increases also occurred in the prior experience study, we are recommending an adjustment be made.
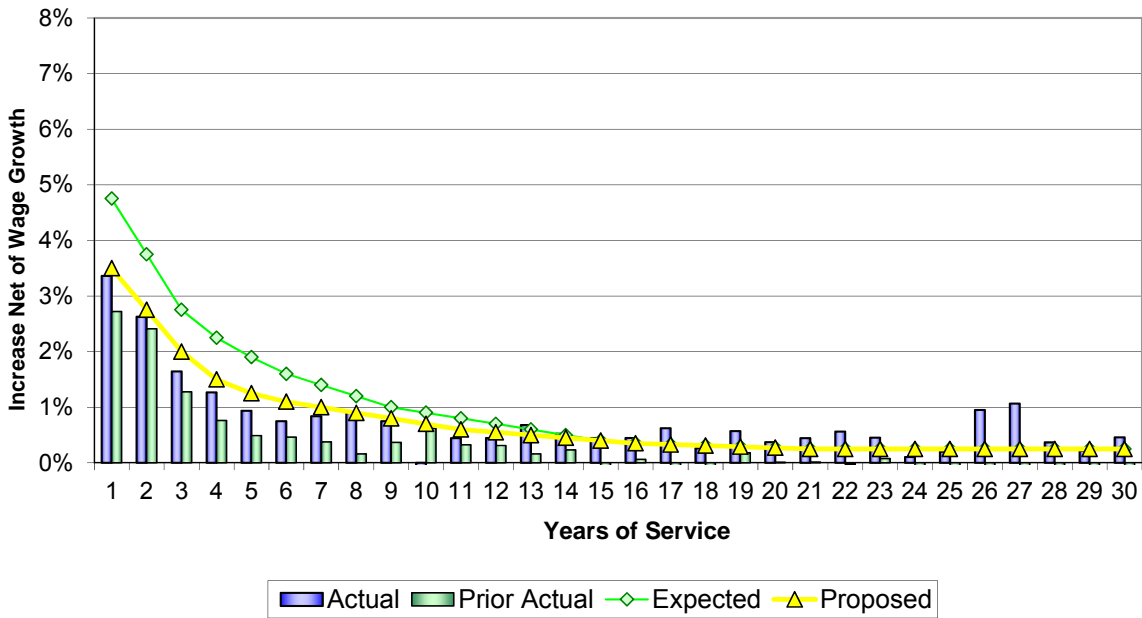
The new recommended rates are shown on Exhibit 3-1.

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 3-1

Total Annual Rates of Increase in Salary
Due to Merit and Longevity

Males and Females

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Section 4:   Death while Active

In this section, we discuss the analysis of actual and expected death rates of active members. Mortality among active members has only a very small financial impact on the system's liabilities.

For current and future retired members, mortality has a much more significant impact. This section only refers to the experience of active members. An analysis of mortality for retired and disabled members is found in Section 5 of this report.

Results

For both male and female active members, fewer deaths than expected occurred. Overall, there were 47 deaths from active status during the study period, while the assumptions predicted 65 deaths. The results are shown in the following table.

Deaths while Active			
Gender	**Actual**	**Expected**	**Act / Exp**
Male	27	39	69%
Female	20	26	77%
Total	47	65	72%

Recommendation

The current assumptions (as adopted with the January 1, 2009 investigation of retired mortality) use the RP 2000 Employee Tables for Males and Females, with a one-year setback to account for slightly better mortality. Based on the results of this study, we are recommending a three-year setback be used instead.

Both the current and the proposed assumptions are projected for expected future improvements in mortality using Projection Scale AA.

The proposed rates result in an Actual-to-Proposed ratio of 92%, as shown in the following table.

Deaths while Active					
Gender	**Actual**	**Expected**	**Act / Exp**	**Proposed**	**Act / Prop**
Male	27	39	69%	31	87%
Female	20	26	77%	20	100%
Total	47	65	72%	51	92%

Section 5: Retired Mortality

Exhibits 5-1 through 5-3 show the actual and expected rates of mortality among service and disability retirees.

Prior to this experience study, the investigation of retired mortality was a stand-alone study performed every four years. The most recent study of retired mortality was conducted as of January 1, 2009. Beginning with this study, the retired mortality analysis will be done in parallel with the investigation of active experience.

Exhibits 5-1 through 5-3 show retired mortality results for the following eligibility groups:

Exhibit 5-1: Mortality Among Service Retirees – Males

Exhibit 5-2: Mortality Among Service Retirees – Females

Exhibit 5-3: Mortality Among Disabled Retirees – Males and Females

Recommendation – Reduced Benefits

As mentioned above, we previously studied the rates of retired mortality in a stand-alone study as of January 1, 2009. At that time, new rates of mortality were adopted. The results of the current experience study showed the actual number of deaths was close to the expected number. Since the current mortality includes a projection for future mortality improvement, we feel the current rates remain reasonable. Therefore, we are recommending no changes to retired mortality at this time.

In previous actuarial valuations, we have used the same mortality assumptions for beneficiaries as we used for service retirees. We recommend continuing this practice. It is impractical to study beneficiary mortality, because we can obtain reliable data only for beneficiaries who survive the related retiree, not for beneficiaries who predecease the related retiree. This results in an undercount of beneficiary deaths. A study using such incomplete data gives misleading results. Moreover, there is no reason to believe that the mortality of beneficiaries should be significantly different from that of service retirees of the same sex.

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 5-1

Mortality Among Service Retirees -- Males
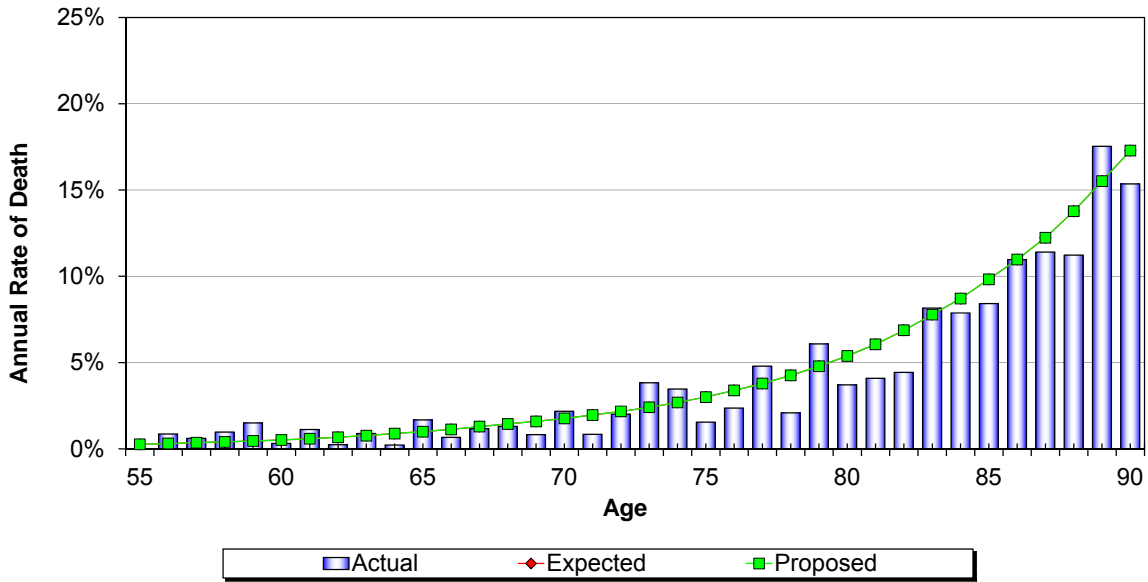
	Expected	Actual	Proposed
Total Count	420	402	No
Actual / Expected	96%		Change

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 5-2

Mortality Among Service Retirees -- Females

	Expected	Actual	Proposed
Total Count	198	206	No Change
Actual / Expected	104%		

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

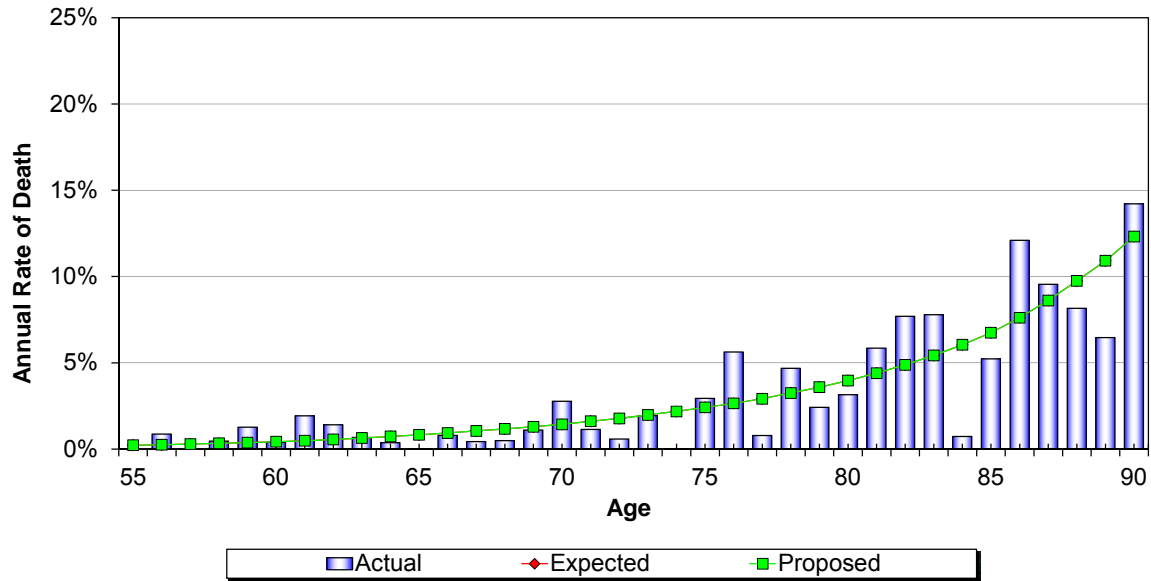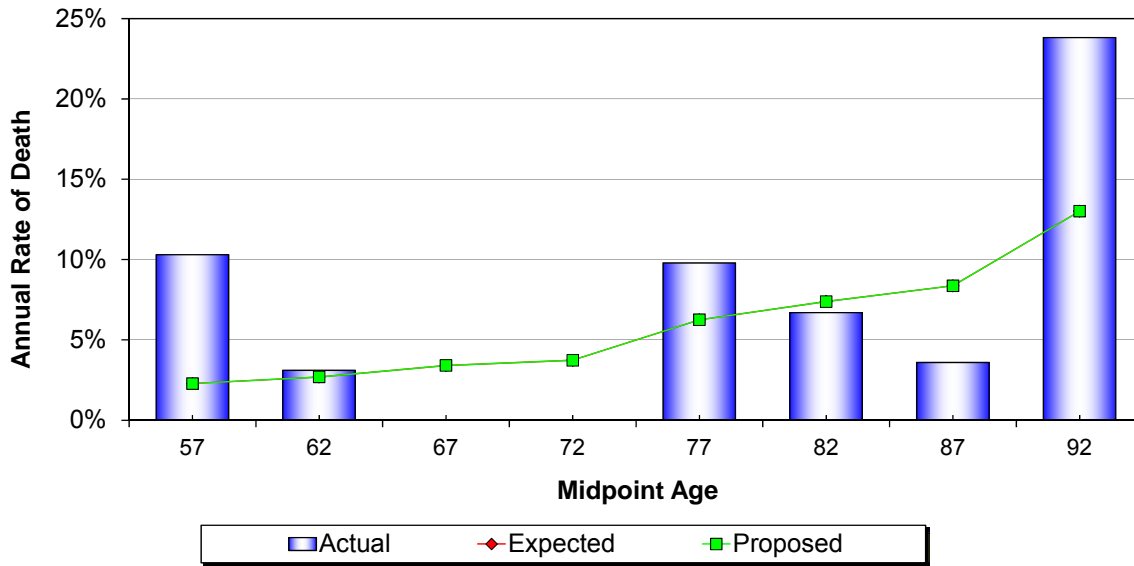**Exhibit 5-3**

Mortality Among Disabled Retirees – Males and Females

	Expected	Actual	Proposed
Total Count	12	12	No
Actual / Expected	100%		Change

Section 6: Service Retirements

Exhibits 6-1 through 6-6 show the actual and expected rates of service retirement. Our analysis of rates of service retirement was by attained age. We study the retirement rates for members eligible to retire with a reduced benefit separately from the rates for members eligible to retire with a full 2% formula benefit. Additionally, we also study retirements for those with 30 or more years of service separately.

Exhibits 6-1 through 6-6 study retirements for the following eligibility groups:

Exhibit 6-1: Reduced Benefits – Male
Exhibit 6-2: Reduced Benefits – Female
Exhibit 6-3: Full Benefits (< 30 Years of Service) – Males
Exhibit 6-4: Full Benefits (< 30 Years of Service) – Females
Exhibit 6-5: Full Benefits (> 30 Years of Service) – Males
Exhibit 6-6: Full Benefits (> 30 Years of Service) – Females

Results – Reduced Benefits

The requirements for early retirement with a reduced benefit are age 52 with 20 years of service, age 57 with 10 years of service, or age 62 with 5 years of service. Exhibits 6-1 and 6-2 show the rates of retirement for members eligible to retire with a reduced benefit. The actual pattern and number of retirements was significantly lower than expected over the study period, with the total number of reduced retirements equal to 64% of the expected amount.

Retirements with Reduced Benefits			
Gender	Actual	Expected	Act / Exp
Male	109	164	66%
Female	95	156	61%
Total	204	320	64%

Recommendation – Reduced Benefits

Based on the results of the study, we are recommending a reduction in the rates of reduced retirement. In making this recommendation, we considered the economic uncertainty that occurred during the study period that caused lower rates of retirement (until 2010) in most public sector systems. The proposed rates result in an Actual-to-Proposed ratio of 74%, as shown in the following table, and are shown in Exhibits 6-1 and 6-2.

Retirements with Reduced Benefits			
Gender	Actual	Proposed	Act / Prop
Male	109	141	77%
Female	95	136	70%
Total	204	277	74%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 6-1

Retirement with Reduced Benefits – Males
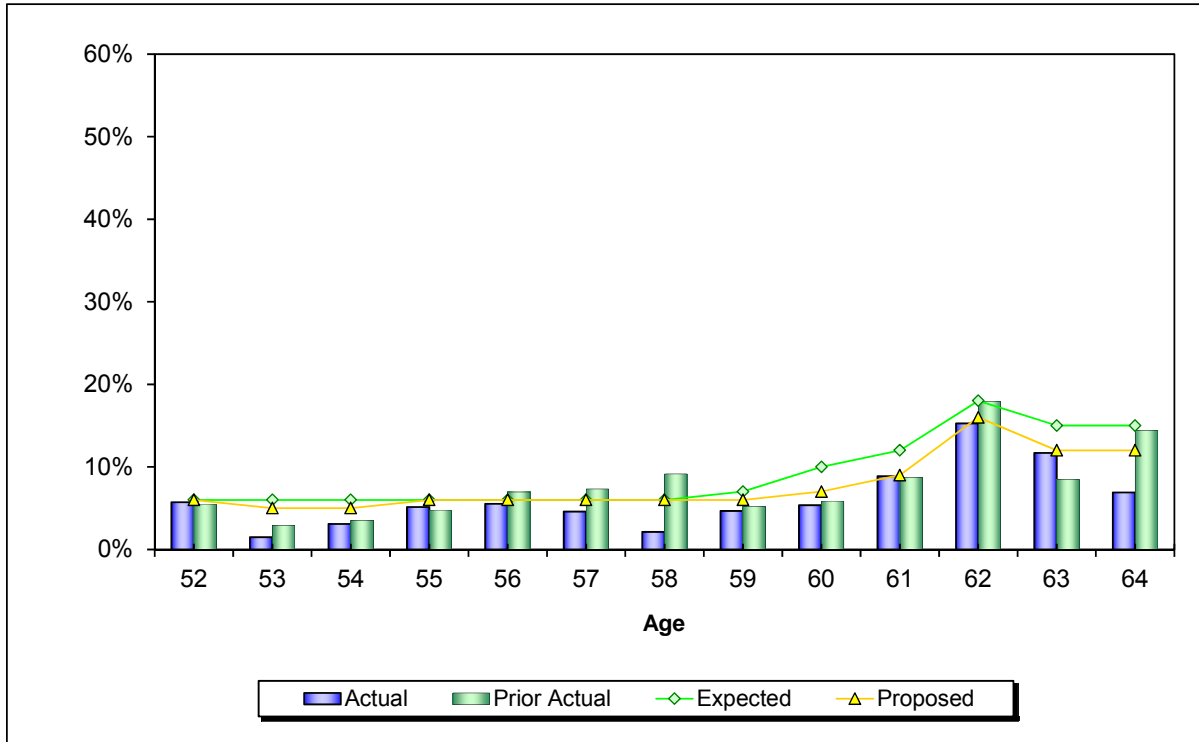
	2007-2010 Data		
	Expected	Actual	Proposed
Total Count	164	109	141
Actual / Expected	67%		77%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 6-2

Retirement with Reduced Benefits – Females

	2007-2010 Data		
	Expected	Actual	Proposed
Total Count	156	95	136
Actual / Expected	61%		70%

Results – Unreduced Benefits

Members who are eligible for the full 2% service benefit with no reduction have higher assumed retirement rates than those only eligible for reduced benefits. This is consistent with the results of this study as shown in Exhibits 6-3 and 6-4 (full benefits) when compared to Exhibits 6-1 and 6-2 (reduced benefits).

For this study we split the group eligible for unreduced benefits into those with less than and those with more 30 years of service. As in the last experience study, we found that members with 30 years of service have a greater probability of retirement than those with less than 30 years of service. This is likely due to the fact that members who have 30 or more years of service are capped at 60% of pay under the benefit formula.

For all groups the actual number of retirements was significantly less than the current assumptions predicted, with the total number of retirements (609) being only 59% of the number expected (1,025).

Retirements with Unreduced Benefits				
Gender	Service	Actual	Expected	Act / Exp
Male	< 30 yrs	164	306	54%
Female	< 30 yrs	164	290	57%
Male	>= 30 yrs	171	255	67%
Female	>= 30 yrs	110	174	63%
Total		609	1,025	59%

Recommendation – Unreduced Benefits

We are recommending the rates of unreduced retirement be decreased for all groups to better reflect the experience. Once again, based on the economic uncertainty that occurred during the study period, which caused lower rates of retirement in most public systems, we are recommending only a partial adjustment for the recent experience.

A comparison of the actual and expected retirements under the recommended assumptions is shown in the table below.

Retirements with Unreduced Benefits				
Gender	Service	Actual	Proposed	Act / Prop
Male	< 30 yrs	164	244	67%
Female	< 30 yrs	164	234	70%
Male	>= 30 yrs	171	214	80%
Female	>= 30 yrs	110	147	75%
Total		609	839	73%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 6-3
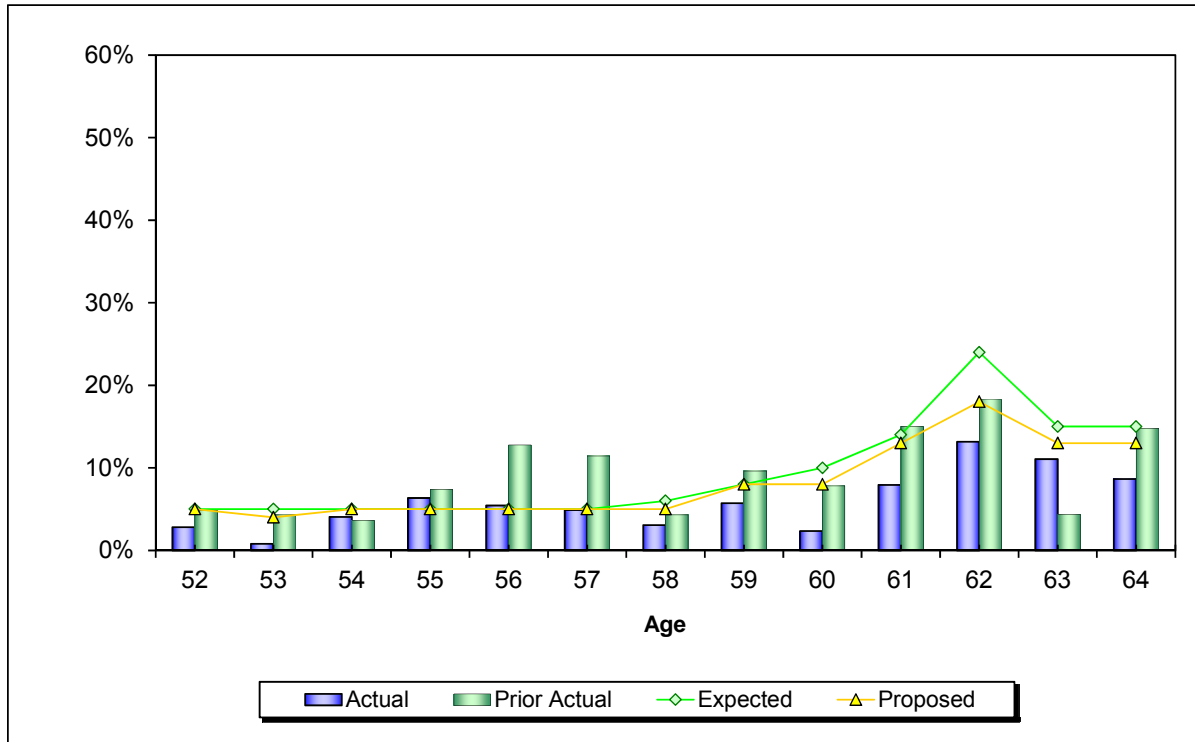
Retirement with Unreduced Benefits
Males with Less than 30 Years of Service
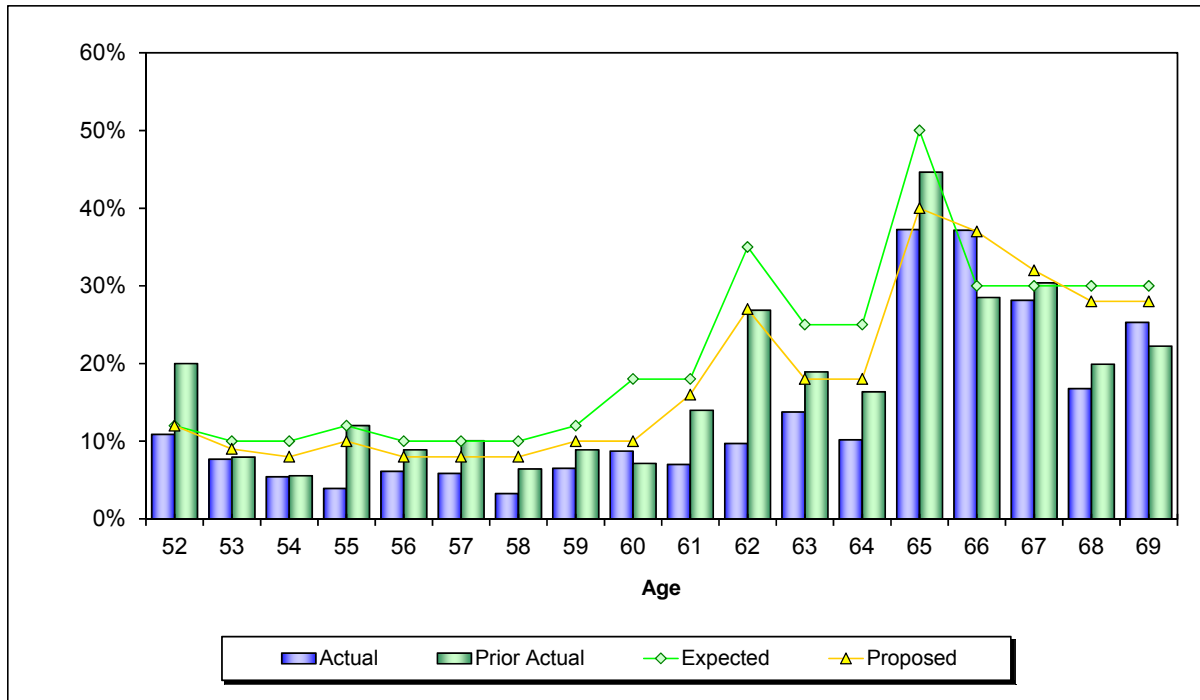
	2007-2010 Data		
	Expected	Actual	Proposed
Total Count	306	164	244
Actual / Expected	54%		67%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 6-4

Retirement with Unreduced Benefits
Females with Less than 30 Years of Service
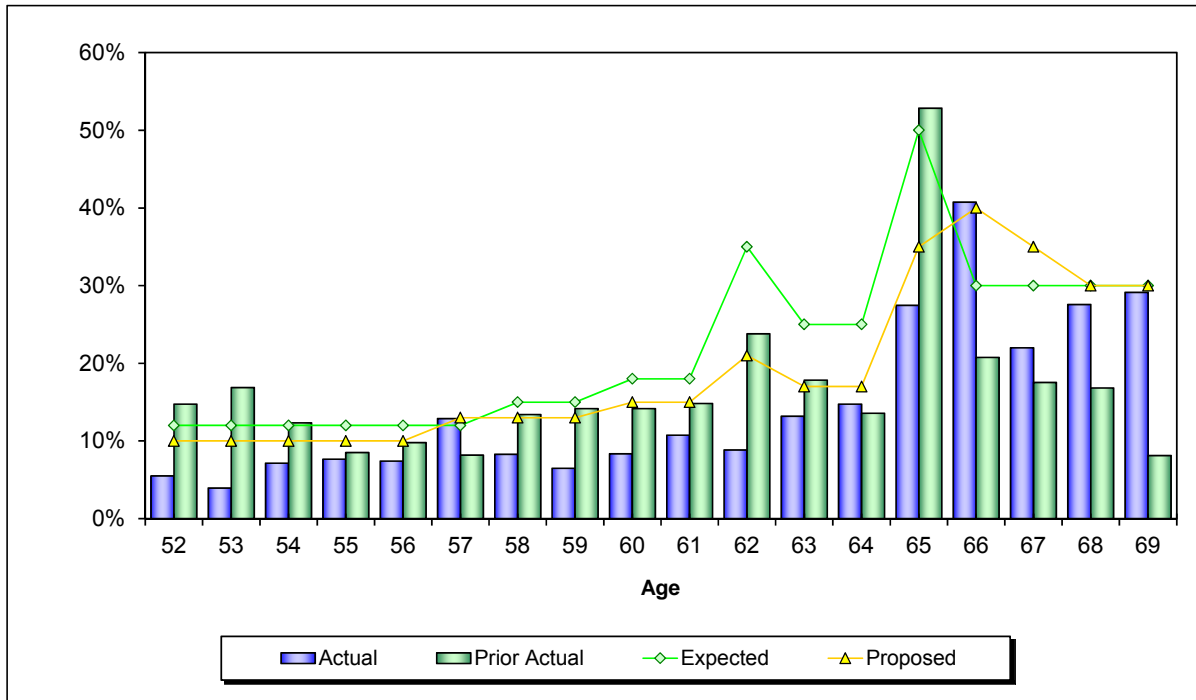
	2007-2010 Data		
	Expected	Actual	Proposed
Total Count	290	164	234
Actual / Expected	56%		70%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 6-5

Retirement with Unreduced Benefits
Males with 30 Years of Service or More
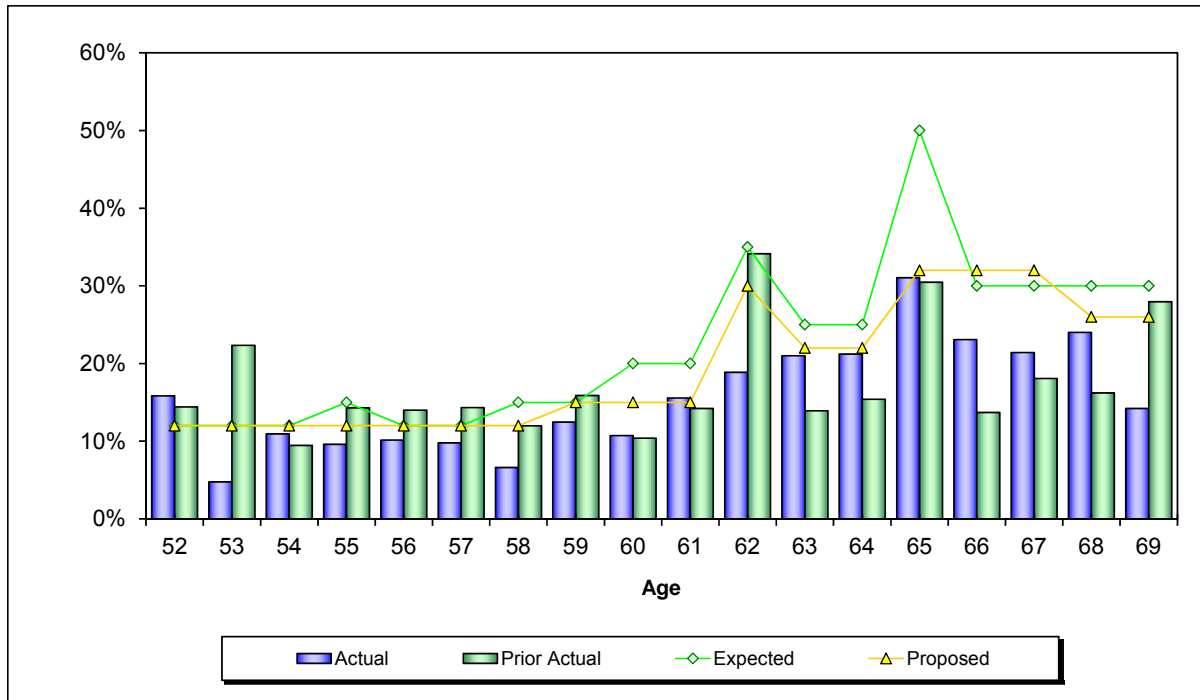
	2007-2010 Data		
	Expected	Actual	Proposed
Total Count	255	171	214
Actual / Expected	67%		80%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 6-6

Retirement with Unreduced Benefits
Females with 30 Years of Service or More
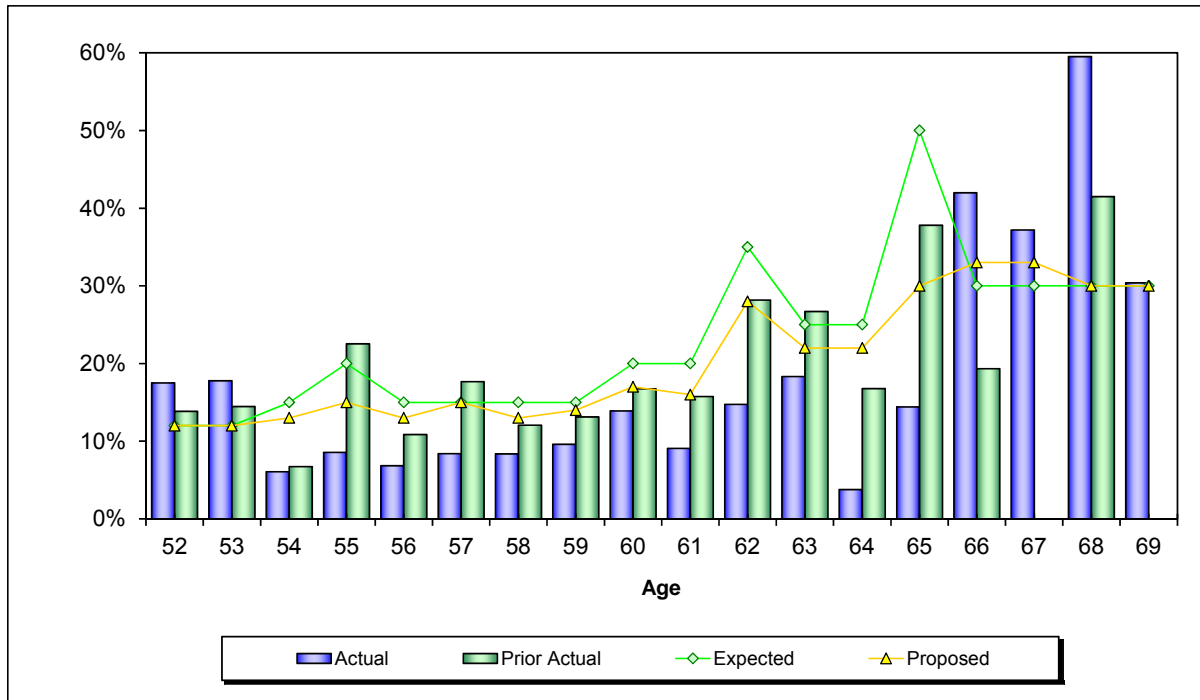
	2007-2010 Data		
	Expected	Actual	Proposed
Total Count	174	110	147
Actual / Expected	63%		75%

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Section 7:   Disability Retirement

The City's Long-Term Disability (LTD) Insurance benefits are reduced by any disability retirement benefits payable by the System. As a result, almost all disabled members elect to receive full 100% (LTD) benefits and delay receiving retirement benefits until normal service retirement age is reached. The result is very few disabilities occur within SCERS and the overall financial impact of this assumption on the System is very small.

Results

Over the four-year study period, there were three disability retirements compared to 12 expected.

Disability Retirement			
Gender	**Actual**	**Expected**	**Act / Exp**
Male	0	6	0%
Female	3	6	50%
Total	3	12	25%

Recommendation

We are recommending reducing the disability assumption to better reflect experience. Since disability experience was substantially lower in this study than in our prior experience study, we are recommending a partial reflection of the experience at this time. If the rates of disability continue to remain lower in the next study, we will recommend further reductions.

Disability Retirement			
Gender	**Actual**	**Proposed**	**Act / Prop**
Male	0	5	0%
Female	3	4	75%
Total	3	9	33%

Section 8:   Other Terminations of Employment

Results

This section of the report summarizes the results of our study of terminations of employment for reasons other than death, service retirement, or disability. Rates of termination vary by years of service – the greater the years of service, the less likely a member is to terminate employment.

The current assumptions also vary by gender, with females having a slightly higher probability of terminating than males.

Overall, the actual number of terminations was substantially lower than the number predicted by the current assumptions (67% of expected). We believe the recent economic environment was a factor in this decline.

Termination -- All Years of Service			
Gender	Actual	Expected	Act / Exp
Male	403	678	59%
Female	504	666	76%
Total	907	1,344	67%

However, among the group comprised of only those members with 10 or more years of service (the group to whom the bulk of the liabilities are attributable), the actual total number of terminations was exactly the number predicted by the current assumption (100% of expected). Note that for males, the assumption predicted more terminations, and for females it predicted fewer terminations.

Termination -- 10 or More Years of Service			
Gender	Actual	Expected	Act / Exp
Male	68	87	78%
Female	106	87	122%
Total	174	174	100%

Recommendation

We have recommended lowering the termination assumptions early in the member's career, as shown in Exhibits 8-1 and 8-2. Additionally, we have recommended adjusting the termination rates at some other points to better match the experience. A summary of the revised results under the recommended assumptions is shown in the following tables.

Termination -- All Years of Service			
Gender	**Actual**	**Proposed**	**Act / Prop**
Male	403	521	77%
Female	504	591	85%
Total	907	1,112	82%

Termination -- 10 or More Years of Service			
Gender	**Actual**	**Proposed**	**Act / Prop**
Male	68	77	88%
Female	106	93	114%
Total	174	170	102%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 8-1

Termination by Years of Service – Males
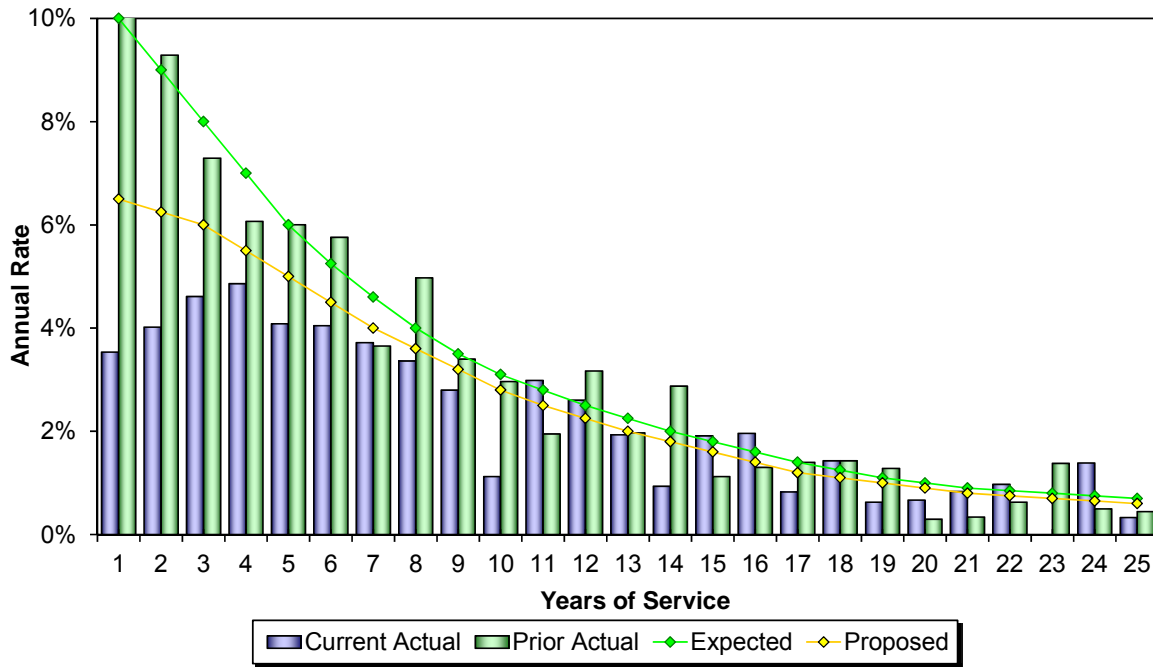
	All Years (Excludes First Year)		
	Expected	Actual	Proposed
Total Count	678	403	521
Actual / Expected	59%		77%

	Service of 10 Years or More		
	Expected	Actual	Proposed
Total Count	87	68	77
Actual / Expected	78%		88%

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 8-2

Termination by Years of Service – Females
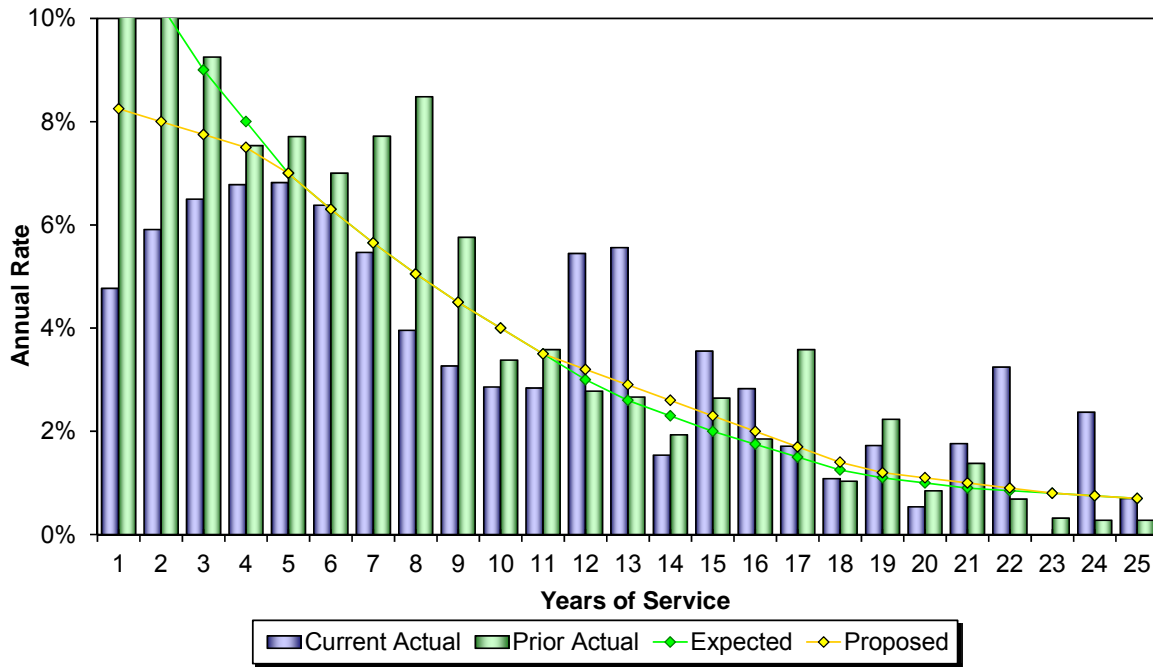
	All Years (Excludes First Year)		
	Expected	Actual	Proposed
Total Count	666	504	591
Actual / Expected	76%		85%

	Service of 10 Years or More		
	Expected	Actual	Proposed
Total Count	87	106	93
Actual / Expected	122%		114%

Section 9: Probability of Refund Upon Vested Termination

This section of the report deals with the rates at which employees elect a refund of their contributions upon termination of service. It only considers vested members who are not yet eligible for service retirement. Under the current assumptions, members who terminate at younger ages have a greater probability of electing to withdraw their contributions. All non-vested members are assumed to take a refund at termination.

Results

Exhibit 9-1 summarizes the results of our study. The results are consistent with our assumptions in that members have a higher likelihood of electing a refund at younger ages; however, the actual rates are lower than expected at younger ages and a bit higher than expected at older ages. Overall, the number of refunds is 85% of what the assumptions predicted

In the prior study, we implemented a separate assumption for the probability of refund among members who terminate with 20 or more years of service. Among this group, the actual number of refunds was 125% of the expected number (five actual refunds, versus four expected).

Recommendation

Based on the experience from both the current and the prior experience studies, we are recommending adjustments to the assumed rates at which members withdraw their contributions in the System. The trend towards a much higher probability of leaving the contributions with the System is consistent with what we have observed with other retirement systems.

For members with 20 or more years of service, we are recommending no change to the currently assumed 20% probability of refund at all ages.

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Exhibit 9-1

Probability of Refund upon Vested Termination – Males and Females
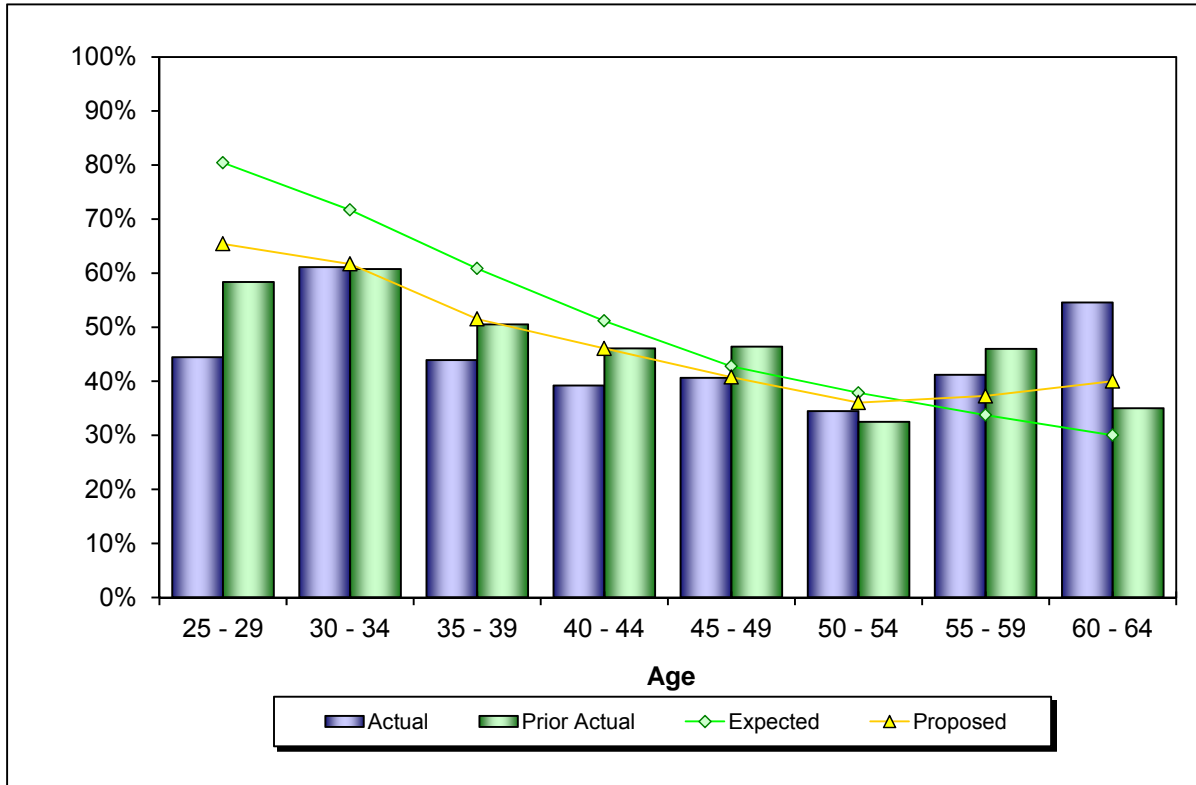
	Less than 20 Years of Service		
	Expected	Actual	Proposed
Total Count	240	203	218
Actual / Expected	84%		93%

	20 Years or More of Service		
	Expected	Actual	Proposed
Total Count	4	5	4
Actual / Expected	125%		125%

Section 10: Actuarial Methods

Actuarial Methods

In addition to the assumptions used in the valuation, we reviewed the actuarial methods. We are not recommending any changes to these assumptions.

- **Cost Method:** The actuarial valuation is prepared using the entry age actuarial cost method. We believe that this cost method is appropriate for SCERS' valuation. We recommend no change. For reference, the following graph shows that the majority of large public sector systems use this cost method (based on the current NASRA Public Fund Survey database which includes over 100 statewide systems):

Percent of Systems Using Actuarial Cost Method
NASRA Survey Results
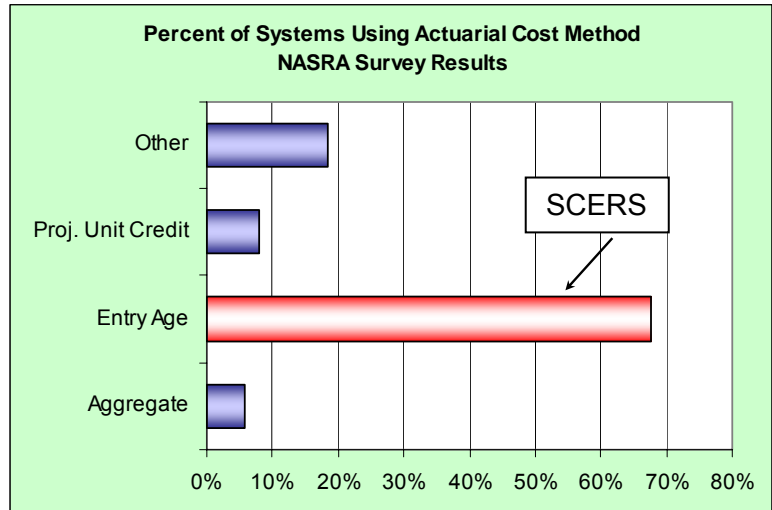
- **Level Percent of Pay vs. Level Dollar:** A significant majority of public pension systems fund on a level percent of pay basis. A minority use the level dollar approach. Using the level dollar method results in higher calculated contribution rates in the short term and ultimately a higher level of funding.

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Actuarial Methods (continued)

- **Valuation of Assets:** SCERS uses the market value of assets in the valuation. We believe this is an appropriate method for fixed contribution rate plans.

  If SCERS were to adopt a funding policy that calculated a contribution rate each year for the City to pay, we believe some variation of smoothing would be appropriate to avoid significant contribution rate volatility. This could be either an asset smoothing method or a contribution smoothing approach.

  For reference, the following graph shows that five years is the most common asset smoothing period among public systems (based on the Public Fund Survey). SCERS is in the minority, although given its fixed contribution rate funding this is not unreasonable.
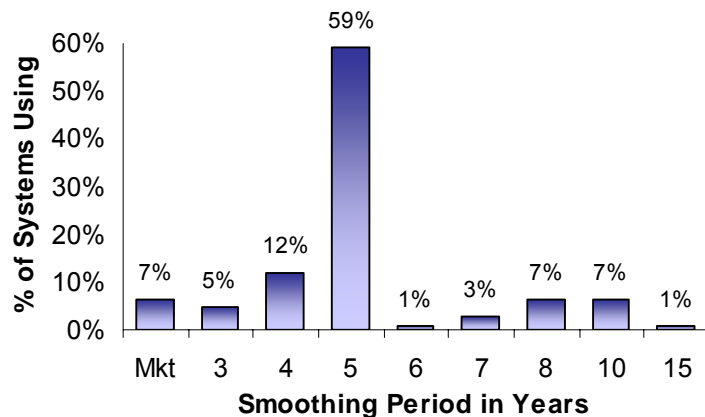
Non-Valuation Methods

- **Crediting on Member Contribution Rate Accounts:** The system currently credits 5.75% per annum on member accounts. We were requested to look at the impact of reducing this rate. The estimated financial impact is discussed in Section 1. Note that a lower interest crediting rate would reduce both the value of refunded accounts and the minimum benefit based on twice the value of member contributions with interest.

  If this change is considered, it should be reviewed by legal counsel. Note that we have not explored these or any other legal issues with respect to this potential change. We are not attorneys and cannot give legal advice on such issues.

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Appendix A: Summary of Proposed Assumptions

This section of the report describes the actuarial procedures and assumptions used in this valuation. The assumptions used in this valuation were adopted by the SCERS Board at their June, 2011 meeting.

The actuarial assumptions used in the valuation are intended to estimate the future experience of the members of the System and of the System itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of the System's benefits. Table A-1 summarizes the actuarial assumptions.

Table A-2 presents expected annual salary increases for various years of service. Tables A-3 through A-6 show rates of decrement for service retirement, disablement, mortality, and other terminations of employment. Table A-7 shows probabilities of vesting upon termination.

Changes from Prior Assumptions

Where we have proposed changes from the prior assumptions, these changes are highlighted in yellow.

Actuarial Cost Method

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets, and (b) the actuarial present value of future normal costs is called the unfunded actuarial accrued liability or UAAL. The UAAL is amortized as a level percentage of the projected salaries of present and future members of the System.

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Records and Data	The data used in the valuation consist of financial information; records of age, sex, service, salary, and contribution rates and account balances of contributing members; and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data were supplied by the System and are accepted for valuation purposes without audit.
Replacement of Terminated Members	The ages at entry and distribution by sex of future members are assumed to average the same as those of the present members they replace. If the number of active members should increase, it is further assumed that the average entry age of the larger group will be the same, from an actuarial standpoint, as that of the present group. Under these assumptions, the normal cost rates for active members will not vary with the termination of present members.
Employer Contributions	At the time of this valuation, the total employer contribution rate for normal costs and amortization of the UAAL was 8.03% of members' salaries.
Administrative Expense	The annual contribution assumed to be necessary to meet general administrative expenses of the system, excluding investment expenses, is 0.40% of members' salaries. This figure is included in the calculation of the normal cost rate.
Valuation of Assets	All assets are valued at market as of the valuation date.
Investment Earnings	The annual rate of investment earnings of the assets of the System is assumed to be 7.75%. This rate is compounded annually and is net of investment expenses.
Postretirement Benefit Increases	Postretirement benefit increases include:

Postretirement benefit increases include:

■ Automatic 1.5% Annual COLA – This benefit applies to all members.

■ 65% Restoration of Purchasing Power (ROPP) – The member's benefit is the greater of 65% of the annual initial benefit adjusted for CPI or their applicable benefit. This minimum benefit is available to all retirees and beneficiaries. The financial impact of the ROPP benefit is valued assuming an annual price inflation rate of 3.5%.

Postretirement Benefit Increases (continued)	Additional contingent COLA increases that were adopted in 2001, but not effective until the System reaches at least a 100% funding ratio, are not included in the valuation results.
Future Salaries	Table A-2 illustrates the rates of future salary increases assumed for the purpose of the valuation. In addition to increases in salary due to promotions and longevity, this scale includes an assumed 4.0% per annum rate of increase in the general wage level of the membership.
Service Retirement	Table A-3 shows the annual assumed rates of retirement among members eligible for service retirement or reduced retirement. Separate rates are also used during the first year a member is eligible for service retirement.
Disablement	The rates of disablement used in this valuation are illustrated in Table A-4. It is assumed that one-third of all disabilities are duty related and two-thirds occur while off duty.
Mortality	The mortality rates used in this valuation are illustrated in Table A-5. A written description of each table used is included in Table A-1.
Other Terminations of Employment	The rates of assumed future withdrawal from active service for reasons other than death, disability or retirement are shown for representative ages in Table A-6. Note that this assumption only applies to members who terminate and are not yet eligible for retirement.
Probability of Refund	Terminating members may forfeit a vested right to a deferred benefit if they elect a refund of their accumulated contributions. Table A-7 gives the assumed probability, at selected ages, that a terminating member will elect to receive a refund of his accumulated contributions instead of a deferred benefit.
	If a member terminates with more than 20 years of service, there is assumed to be a 20% probability that the member will elect a refund.
	Note that the probability of refund assumption only applies to members who terminate with a vested benefit and are not yet eligible for retirement.
Interest on Member Contributions	Interest on member contributions is assumed to accrue at a rate of 5.75% per annum, compounded annually.

Portability   The cost of portability with other public retirement systems is not included in this valuation.

**Probability of
Marriage**   We assumed 60% of the active members are married or have a registered domestic partner.

**Commencement for
Terminated Vested
Members**   Vested members who terminate but elect to leave their contributions in the System are assumed to commence receiving benefits at age 62.

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Table A-1

Summary of Valuation Assumptions

January 1, 2011

I. Economic assumptions

A.	Price inflation	3.50%
B.	General wage increases	4.00
C.	Investment return	7.75
D.	Increase in membership	0.00
E.	Interest on member accounts	5.75

II. Demographic assumptions

A.	Salary increases due to promotion and longevity	Table A-2
B.	Retirement	Table A-3
C.	Disablement	Table A-4
D.	Mortality* among contributing members	Table A-5

      Men   RP 2000 Employees Table for Males, with ages set back three years.

      Women RP 2000 Employees Table for Females, with ages set back three years.

E. Mortality* among service retired members and beneficiaries   Table A-5

      Men   RP2000 Combined Healthy Males, with ages set back one year.

      Women RP2000 Combined Healthy Females, with ages set back one year.

F. Mortality* among disabled members   Table A-5

      Men   RP2000 Disabled Males, with ages set back four years.

      Women RP2000 Disabled Females, with ages set back four years.

G.	Other terminations of employment	Table A-6
H.	Probabilities of vesting on termination	Table A-7

All mortality tables are generational using Projection Scale AA.

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Table A-2

Future Salaries

Annual Rate of Increase

Years of Service	Promotion and Longevity	Total
0 to 1	4.50%	8.68%
1 to 2	3.50	7.64
2 to 3	2.75	6.86
3 to 4	2.00	6.08
4 to 5	1.50	5.56
9 to 10	0.80	4.83
14 to 15	0.45	4.47
19 to 20	0.29	4.30
24 to 25	0.25	4.26
29 to 30	0.25	4.26
35 or more	0.25	4.26

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Table A-3

Retirement

	Annual Probability					
	Men			**Women**		
		Eligible for Full Benefits			**Eligible for Full Benefits**	
Age	**Eligible for Reduced Benefits**	**Less than 30 years of service**	**30 years or more of service**	**Eligible for Reduced Benefits**	**Less than 30 years of service**	**30 years or more of service**
Less than 50	0.0%	10.0%	8.0%	0.0%	10.0%	10.0%
50	6.0	10.0	10.0	5.0	10.0	12.0
51	6.0	10.0	10.0	5.0	10.0	12.0
52	6.0	12.0	12.0	5.0	10.0	12.0
53	5.0	9.0	12.0	4.0	10.0	12.0
54	5.0	8.0	12.0	5.0	10.0	13.0
55	6.0	10.0	12.0	5.0	10.0	15.0
56	6.0	8.0	12.0	5.0	10.0	13.0
57	6.0	8.0	12.0	5.0	13.0	15.0
58	6.0	8.0	12.0	5.0	13.0	13.0
59	6.0	10.0	15.0	8.0	13.0	14.0
60	7.0	10.0	15.0	8.0	15.0	17.0
61	9.0	16.0	15.0	13.0	15.0	16.0
62	16.0	27.0	30.0	18.0	21.0	28.0
63	12.0	18.0	22.0	13.0	17.0	22.0
64	12.0	18.0	22.0	13.0	17.0	22.0
65		40.0	32.0		35.0	30.0
66		37.0	32.0		40.0	33.0
67		32.0	32.0		35.0	33.0
68		28.0	26.0		30.0	30.0
69		28.0	26.0		30.0	30.0
70		*	*		*	*

* Immediate retirement is assumed for every person age 70 or over.

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Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Table A-4

Disablement*

Age	Annual Rates	
	Men	**Women**
20	.00%	.00%
25	.00	.00
30	.04	.04
35	.04	.04
40	.05	.05
45	.05	.05
50	.08	.08
55	.08	.08
60	.08	.08
65	.00	.00

It is assumed that one-third of all disabilities are duty related and two-thirds are non-duty related.

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Table A-5

Mortality

Age	Contributing Members		Annual Probability* Members Retired for Service and Beneficiaries of Members		Disabled Members	
	Men	Women	Men	Women	Men	Women
22	0.03 %	0.02 %	0.04 %	0.02 %	2.26 %	0.74 %
27	0.04	0.02	0.04	0.02	2.26	0.74
32	0.04	0.02	0.05	0.03	2.26	0.74
37	0.07	0.04	0.08	0.05	2.26	0.74
42	0.10	0.06	0.11	0.08	2.26	0.74
47	0.14	0.10	0.16	0.12	2.26	0.74
52	0.20	0.16	0.24	0.19	2.64	0.98
57	0.28	0.23	0.42	0.31	3.29	1.45
62	0.44	0.36	0.77	0.58	3.93	1.97
67	0.70	0.54	1.44	1.10	4.66	2.53
72	N/A	N/A	2.46	1.86	5.69	3.32
77	N/A	N/A	4.22	3.10	7.33	4.58
82	N/A	N/A	7.20	5.08	9.76	6.35
87	N/A	N/A	12.28	8.64	12.83	8.78
92	N/A	N/A	19.98	14.46	16.22	12.25

The mortality rates shown above are generationally projected on an individual basis using Projection Scale AA for the valuation.

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Table A-6

Other Terminations of Employment Among Members Not Eligible to Retire

Years of Service	Annual Rates for Men	Annual Rates for Women
0 to 1	7.0%	8.5%
1 to 2	6.5	8.3
2 to 3	6.3	8.0
3 to 4	6.0	7.8
4 to 5	5.5	7.5
5 to 6	5.0	7.0
6 to 7	4.5	6.3
7 to 8	4.0	5.7
8 to 9	3.6	5.1
9 to 10	3.2	4.5
10 to 11	2.8	4.0
11 to 12	2.5	3.5
12 to 13	2.3	3.2
13 to 14	2.0	2.9
14 to 15	1.8	2.6
15 to 16	1.6	2.3
16 to 17	1.4	2.0
17 to 18	1.2	1.7
18 to 19	1.1	1.4
19 to 20	1.0	1.2
20 to 21	0.9	1.1
21 to 22	0.8	1.0
22 to 23	0.8	0.9
23 to 24	0.7	0.8
24 to 25	0.7	0.8
25 to 26	0.6	0.7
26 to 27	0.6	0.7
27 to 28	0.5	0.6
28 to 29	0.5	0.6
29 to 30	0.4	0.5
30 and up	0.5	0.5

Seattle City Employees' Retirement System
Investigation of Experience (2007-2010)

Table A-7

Probability of Refund

Age	Probabilities of Refund upon Termination*
25	70.0%
30	65.0
35	55.0
40	48.0
45	43.0
50	38.0
55	36.0
60	40.0

*If service is 20 or more years at termination,
probability of refund is equal to 20%.*