Cavanaugh Macdonald
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OMAHA SCHOOL EMPLOYEES RETIREMENT SYSTEM

Five Year Experience Study
September 1, 2012 to August 31, 2016

Submitted: April 5, 2017

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April 5, 2017

Board of Trustees
Omaha School Employees Retirement System
3215 Cummings Street
Omaha, NE 68131

Dear Trustees:

It is a pleasure to submit this report of our investigation of the experience of the Omaha School Employees Retirement System (OSERS) for the period of September 1, 2012 through August 31, 2016.

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 January 1, 2017 actuarial valuation. This report includes our recommended changes from the prior assumptions that are intended to better anticipate the emerging experience of the Plan. Actual future experience, however, may still differ from these assumptions.

In preparing this report, we relied, without audit, on information supplied by the System for the annual actuarial valuations. If any data or other information is inaccurate or incomplete, our analysis and recommendation may be impacted and a revised report may need to be issued.

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 which are consistent with the principles prescribed by the Actuarial Standards Board (ASB) and the Code of Professional Conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries.

We further certify that the assumptions developed in this report satisfy ASB Standards of Practice, in particular, No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations* and No. 35, *Selection of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations*.

We look forward to our discussions and the opportunity to respond to your questions and comments.

I, Patrice A. Beckham, am a member of the American Academy of Actuaries, an Enrolled Actuary and a Fellow 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,

Patrice A. Beckham, FSA, EA, FCA, MAAA
Principal and Consulting Actuary

The purpose of an actuarial valuation is to provide a timely best estimate of the ultimate costs of a retirement system. Actuarial valuations of the Omaha School Employees Retirement System (OSERS or the System) are prepared annually to determine the actuarial contribution rate to fund the System on an actuarial reserve basis, i.e. the current assets plus future contributions, along with investment earnings will be sufficient to provide the benefits promised by the System. The valuation requires the use of certain assumptions with respect to the occurrence of future events, such as rates of death, disability, termination of employment, retirement age and salary changes to estimate the obligations of the System.

The basic purpose of an experience study is to determine whether the actuarial assumptions currently in use have accurately anticipated actual emerging experience. This information, along with the professional judgment of the Board, its advisors, and the actuary, is used to evaluate the appropriateness of continued use of the current actuarial assumptions. When analyzing experience and assumptions, it is important to realize that actual experience is reported short term while assumptions are intended to be long term estimates of experience. Therefore, no single experience study period should be given full credibility in setting actuarial assumptions. If significant differences exist between what is expected from our assumptions and actual experience, our strategy is usually to recommend a change in assumptions that would produce results somewhere between the actual and expected experience.

Our Philosophy

Similar to an actuarial valuation, the calculation of actual and expected experience is a fairly mechanical process. From one actuary to another, there should be very little difference in numerical results. However, the setting of assumptions is a different story, as it is more art than science. In this report, we have recommended a few changes to certain assumptions. To allow a better understanding of our thought process, we offer a brief summary of our philosophy:

- **Don't Overreact**: When we see significant differences in actual versus expected experience, we generally do not adjust our rates to reflect the entire difference. If the experience is credible and we believe it reflects future expectations, we will typically recommend rates somewhere between the old rates and the new experience. If the experience during the next study period shows the same result, we will probably recognize the trend at that point in time or at least move further in the direction of the observed experience. On the other hand, if actual experience in the next study is closer to its prior level, we will not have overreacted, possibly causing volatility in the actuarial contribution rates.

- **Anticipate Trends**: If there is an identified trend that is expected to continue, we believe that this should be recognized. An example is the retiree mortality assumption. It is an established trend that people are living longer. Therefore, we believe the best estimate of liabilities in the valuation should reflect the expected increase in life expectancy.

- **Simplify**: In general, we attempt to identify which factors are significant and eliminate or ignore the ones that do not materially improve the accuracy of the liability projections.

At the request of the Board of Trustees, Cavanaugh Macdonald Consulting, LLC performed a study of the experience of the Omaha School Employees Retirement System for the period September 1, 2012 through August 31, 2016. This report presents the results and recommendations of our study which, if approved, will be implemented in the January 1, 2017 actuarial valuation of the System.

These assumptions have been developed in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the applicable Standards of Practice adopted by the Actuarial Standards Board of the American Academy of Actuaries.

SCOPE OF THIS REPORT

The actuarial valuation utilizes various actuarial methods and two different types of assumptions: economic and demographic. Economic assumptions are related to the general economy and its impact on the System. Demographic assumptions are based on the emergence of the specific experience of the Systems' members.

All of the major actuarial assumptions that will be used in the January 1, 2017 Actuarial Valuation have been reviewed in this Study. The remainder of this report is divided as follows:

SECTION 2 EXECUTIVE SUMMARY
SECTION 3 ACTUARIAL METHODS
SECTION 4 ECONOMIC ASSUMPTIONS
SECTION 5 DEMOGRAPHIC ASSUMPTIONS
SECTION 6 MORTALITY
SECTION 7 RETIREMENT
SECTION 8 TERMINATION OF EMPLOYMENT (WITHDRAWAL)
SECTION 9 SALARY INCREASES
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Actuarial Methods

The actuarial methods outlined in the Funding Policy include:

- Entry age normal cost method
- Expected + 25% asset smoothing method
- Amortization of UAAL, as a level percent of payroll, over a closed 30 year period.

As a result of our review of these methodologies, we are recommending that changes in the UAAL be amortized over separate 25-year closed periods beginning on the date the change is measured. We recommend the other actuarial methods be retained.

Economic Assumptions

The following set of economic assumptions is recommended:

	Current	Proposed
• Investment Return:	8.00%	7.50%
• Inflation Assumption:	3.00%	2.75%
• General Wage Increase:	4.00%	3.25%

Given the actual historical data, market expectations, and the assumptions used by the Social Security Administration in their 75-year projections, we are recommending the inflation assumption be lowered from 3.00% to 2.75%.

Effective January 1, 2017, the Nebraska Investment Council is responsible for investing OSERS' trust funds. The long term asset allocation for the OSERS portfolio is the same as that of the Nebraska School Retirement System. Last fall, the investment return assumption for the Nebraska School Retirement System was changed from 8.0% to 7.50% (inflation of 2.75% plus real return of 4.75%). Based on that analysis, we believe it is reasonable to use the same investment return assumption for OSERS. Therefore, we recommend the investment return assumption for OSERS be lowered from 8.0% to 7.5%.

The general wage increase assumption is composed of inflation and a productivity assumption. The current general wage increase is 4.00% which reflects an inflation assumption of 3.00% and a productivity assumption of 1.00%. Based on our analysis, we are recommending a decrease in this assumption from 4.00% to 3.25%, composed of inflation of 2.75% and productivity of 0.50%.

Demographic Assumptions

Based on the observed data and associated analysis, the recommended changes to the current demographic assumptions are:

- Change the mortality assumption to the most recent table published by the Society of Actuaries, RP-2014 Mortality Table, with a one-year age set forward for males and a one-year age setback for females. Generational mortality improvements will be modeled using the MP-2016 scale.

- Modify the retirement rates for both certificated and classified members

- Modify the election of refund at termination by Classified members

- Change the termination of employment assumption to be the same regardless of gender for the certificated group and move to a pure service-based assumption for both the certificated and classified group.

- Change the individual salary increase assumption to a service-based assumption for both certificated and classified employees.

Financial Impact

The financial impact of the proposed assumption changes is based on the results of the most recent actuarial valuation, performed as of September 1, 2015. While the actual results for the January 1, 2017 valuation will vary, we expect the change, as a percentage of liabilities and normal cost, to be comparable. The results are shown on the following page.

Estimate of Financial Impact of Assumption Changes
Based on September 1, 2015 Valuation

Dollars In Thousands

	Baseline (Current Assumptions)	Demographic Changes	All Assumption Changes
1. Present Value of Future Benefits	$2,124,400	$2,163,208	$2,307,586
2. Present Value Future Normal Costs	325,694	327,656	383,058
3. Actuarial Accrued Liability (1) – (2)	$1,798,706	$1,835,552	$1,924,528
4. Actuarial Value of Assets	1,312,905	1,312,905	1,312,905
5. Unfunded Actuarial Accrued Liability (UAAL) (3) – (4)	$ 485,801	$ 522,647	$ 611,623
6. Funded Ratio (4) / (3)	72.99%	71.53%	68.22%
7. Normal Cost Rate	11.96%	11.78%	13.51%
8. UAAL Payment	8.80%	9.51%	11.53%
9. Actuarial Contribution Rate (7) + (8)	20.76%	21.29%	25.04%
10. Statutory Contribution Rate	21.66%	21.66%	21.66%
11. Contribution Shortfall/(Surplus) (9) – (10)	(0.90%)	(0.37%)	3.38%

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This section describes the actuarial methods that are used to determine the actuarial required contribution rate of the System. These methods are part of the Funding Policy adopted by the Board in 2013 and currently in use.

Actuarial Cost Method	Entry Age Normal
Asset Valuation Method	Expected + 25% Method
Amortization Method	Level percent of payroll
Amortization Period	30 years, closed, effective with the 2013 valuation

ACTUARIAL COST METHOD

The systematic financing of a pension plan requires that contributions be made in an orderly fashion while a member is actively employed, so that the accumulation of these contributions, together with investment earnings should be sufficient to provide promised benefits and cover administration expenses. The actuarial valuation is the process used to determine when money should be contributed; i.e., as part of the budgeting process.

The actuarial valuation will not impact the amount of benefits paid or the actual cost of those benefits. In the long run, actuaries cannot change the costs of the pension plan, regardless of the funding method used or the assumptions selected. However, actuaries **will** influence the incidence of costs by their choice of methods and assumptions.

The valuation or determination of the present value of all future benefits to be paid by the System reflects the assumptions that best seem to describe anticipated future experience. The choice of a funding method does not impact the determination of the present value of future benefits. The funding method determines only the incidence of cost. In other words, the purpose of the funding method is to allocate the present value of future benefits determination into annual costs. In order to perform this allocation, it is necessary for the funding method to "break down" the present value of future benefits into two components: (1) that which is attributable to the past (2) and that which is attributable to the future. The excess of that portion attributable to the past over the plan assets is then amortized over a period of years. Actuarial terminology refers to the portion attributable to the past as the "past service liability" or the "actuarial liability". The portion of the present value of future benefits allocated to the future is commonly known as "the present value of future normal costs", with the specific piece allocated to the current year being called "the normal cost". The difference between the plan assets and actuarial liability is called the "unfunded actuarial liability".

Two key points should be noted. First, there is no single "correct" funding method. Second, the allocation of the present value of future benefits and hence cost to the past for amortization and to the future for annual normal cost payments is not necessarily in a one-to-one relationship with service credits earned in the past and future service credits to be earned.

There are various actuarial cost methods, each of which has different characteristics, advantages and disadvantages. OSERS' Funding Policy uses the Entry Age Normal (EAN) actuarial cost method. The rationale of the EAN funding method is that the cost of each member's benefit is determined to be a level percentage of his salary from date of hire to the end of his employment with the employer. This level percentage multiplied by the member's annual salary is referred to as the normal cost and is that portion of

the total cost of the employee's benefit which is allocated to the current year. The portion of the present value of future benefits allocated to the future is determined by multiplying this percentage times the present value of the member's assumed earnings for all future years including the current year. The entry age normal actuarial liability is then developed by subtracting from the present value of future benefits that portion of costs allocated to the future. To determine the unfunded actuarial liability, the value of plan assets is subtracted from the entry age normal actuarial liability. The current year's cost to amortize the unfunded actuarial liability is developed by applying an amortization factor.

It is to be expected that future events will not occur exactly as predicted by the actuarial assumptions in each year. Actuarial gains/losses from experience under this actuarial cost method can be directly calculated and are reflected as a decrease/increase in the unfunded actuarial liability. Consequently, the gain/loss results in a decrease/increase in the amortization payment, and therefore, the actuarial contribution rate.

OSERS currently uses the Entry Age Normal cost method, which is very common with governmental plans because it develops a normal cost rate that tends to be stable and less volatile. In addition, the governmental accounting standards, GASB Statements Number 67 and 68, require the use of the Entry Age Normal cost method. **We recommend the Entry Age Normal actuarial cost method be retained.**

ACTUARIAL VALUE OF ASSETS

In preparing an actuarial valuation, the actuary must assign a value to the assets of the fund. An adjusted market value (called the actuarial value of assets) is often used to smooth out the volatility in the market value. A smoothing method is used because most plan sponsors would prefer to have annual costs remain relatively level, as a percentage of payroll or in actual dollars, rather than a cost pattern that is extremely volatile.

The actuary does not have complete freedom in assigning this value. GASB has certain requirements related to the calculations prepared under GASB Number 25. The American Academy of Actuaries (AAA) also has basic principles regarding the calculation of a smoothed value, *Actuarial Standard of Practice No. 44 (ASOP 44), Selection and Use of Asset Valuation Methods for Pension Valuations.*

ASOP 44 provides that the asset valuation method should bear a reasonable relationship to the market value. Furthermore, the asset valuation method should be likely to satisfy both of the following:

- Produce values within a reasonable range around market value, AND
- Recognize differences from market value in a reasonable amount of time.

In lieu of both of the above, the standard will be met if either of the following requirements is satisfied:

- There is a sufficiently narrow range around the market value, OR
- The method recognizes differences from market value in a sufficiently short period.

These rules or principles prevent the asset valuation methodology from being used to distort annual funding patterns. No matter what asset valuation method is used, it is important to note that, like a cost method or actuarial assumptions, the asset valuation method does not affect the true cost of the plan; it only impacts the incidence of cost.

OSERS values assets, for actuarial valuation purposes, based on the principle that the difference between actual and expected investment returns should be subject to partial recognition to smooth out fluctuations in the total return achieved by the fund from year to year. This philosophy is consistent with the long-term nature of a retirement system. Under this method, the actuarial value of the assets is the expected value of assets plus 25% of the difference between market value and expected value, where the expected value is last year's actuarial value and subsequent cash flows into and out of the fund accumulated with interest at the valuation rate (8%). This is mathematically equivalent to using a weighted average of 75% of the expected value and 25% of actual market value.

The current asset valuation method for OSERS also includes what is known as a "corridor", which provides that once the initial determination of the actuarial value of assets is made it is compared to a corridor around market value (80% of market value to 120% of market value). If the initial actuarial value lies outside the corridor, the final actuarial value of assets is set equal to the corresponding corridor value. For example, if the initial calculation of the actuarial value of assets is 132% of market value, the actuarial value is set equal to 120% of market value. We believe the corridor is necessary to ensure actuarial standards are met.

OSERS' funded status is often compared to the Nebraska School Retirement System (NPERS School). The NPERS School system uses a different asset valuation method which recognizes the dollar amount of the difference between the actual investment return and the assumed investment return on the market value of assets equally over a five-year period. This is a very common methodology used by public plans and it also meets actuarial standards under ASOP 44.

An asset valuation method is used to "smooth out" the volatility that occurs in the measurement of assets using pure market value. We believe the current method has provided the desired smoothing of asset experience and complies with actuarial standards of practice. It also converges back to market value of assets more quickly when there are returns both below and above the assumed return. **Our recommendation is to retain the current asset valuation method unless the Board wishes to use the NPERS School methodology to provide consistency of results. Either method will provide the desired smoothing of actual investment experience and is acceptable under actuarial standards of practice.**

AMORTIZATION OF UAL

As described above, actuarial liabilities are the portion of the actuarial present value of future benefits that are not included in future normal costs. Thus it represents the liability that, in theory, should have been funded through normal costs for past service. Unfunded actuarial liabilities (UAL) exist when actuarial liabilities exceed plan assets. These deficiencies can result from (i) plan improvements that have not been completely paid for, (ii) experience that is less favorable than expected, (iii) assumption changes that increase liabilities or (iv) actual contributions that are less than the actuarial contribution rate. If the actuarial value of assets (AVA) exceeds the actuarial liability (AL), "surplus" exists.

There are a variety of different methods that can be used to amortize the UAL. Each method results in a different payment stream and, therefore, has cost implications. For each methodology, there are three basic characteristics:

- The period over which the UAL is amortized,
- The rate at which the amortization amount increases, and
- The number of components of UAL with separate amortization bases.

Amortization Period: The amortization period can be either closed or open. If it is a closed amortization period, the number of years remaining in the amortization period declines by one in each future valuation. Alternatively, if the amortization period is an open or rolling period, the amortization period does not decline but is reset to the same number each year. This approach essentially "refinances" the System's debt (UAAL) every year.

Amortization Payment: The level dollar amortization method is similar to the method in which a home owner pays off a mortgage. The liability, once calculated, is financed by a constant fixed dollar amount, based on the amortization period until the liability is extinguished. This results in the liability steadily decreasing while the payments, though remaining level in dollar terms, in all probability decrease as a percentage of payroll. (Even if a plan sponsor's population is not growing, inflationary salary increases will usually be sufficient to increase the aggregate covered payroll).

The rationale behind the level percentage of payroll amortization method is that since normal costs are calculated to be a constant percentage of pay, the unfunded actuarial accrued liability should be paid off in the same manner. When this method of amortizing the unfunded actuarial accrued liability is adopted, the initial amortization payments are lower than they would be under a level dollar amortization payment method, but the payments increase at a fixed rate each year so that ultimately the annual payment far exceeds the level dollar payment. The expectation is that total payroll will increase at the same rate so that the amortization payments will remain constant, as a percentage of payroll. In the initial years, the level percentage of payroll amortization payment is often less than the interest accruing on the unfunded actuarial accrued liability meaning that even if there are no experience losses, the dollar amount of the unfunded actuarial accrued liability will grow (called negative amortization). This is particularly true if the plan sponsor is paying off the unfunded actuarial accrued liability over a long period, such as 20 or more years.

Use of the level percentage of payroll amortization has its advantages and disadvantages. From a budgetary standpoint, it makes sense to develop UAL contribution rates that are level as a percentage of payroll, since contributions to fund the Plan are made as a percent of payroll and normal cost is developed as a level percent of payroll. However, if payroll doesn't grow as expected the UAL payment, determined as a percent of payroll, will increase rather than remain level. In addition, this approach clearly results in slower funding of the UAL.

Amortization Bases: The UAAL can either be amortized as one single amount or as components, or "layers", each with a separate amortization base, payment and period. If the UAAL is amortized as one amount, the UAAL is recalculated each year in the valuation and experience gains/losses or other changes in the UAAL are folded into the single UAAL amortization base. The amortization payment is then the total UAAL divided by an amortization factor for the applicable amortization period.

OSERS' current Funding Policy develops the UAL contribution rate using a single amortization based with a closed 30-year period beginning with the September 1, 2013 valuation (so 27 years for the January 1, 2017 valuation). To provide more stability to the actuarial contribution rate and mitigate the volatility of gains and losses on the additional contribution required by the School District in future years, it makes sense to use the layered amortization approach with separate bases established each year to reflect the unexpected changes in the UAL. These bases would be amortized over a new 25-year period commencing on the valuation date. This amortization policy will still move the System to a fully funded status. **We recommend the amortization policy be changed to reflect a layered amortization approach with new bases amortized over a new, closed 25-year period beginning on the valuation date.**

ECONOMIC ASSUMPTIONS

The economic assumptions for OSERS include price inflation, cost of living adjustment, long-term investment return, interest crediting rate for member accounts, wage growth (the across-the-board portion of salary increases) and the covered payroll increase assumption. Unlike demographic assumptions, economic assumptions do not lend themselves to analysis largely on the basis of internal historical patterns because economic assumptions are impacted by external forces in the economy. The investment return and general wage increase assumptions are typically selected on the basis of expectations in an inflation-free environment and then increased by the long-term expectation for inflation, called the "building block" approach.

Sources of data considered in the analysis and selection of the economic assumptions included:

- The 2016 Social Security Trustees Report
- Future expectations of IPERS investment consultant, Wilshire Consulting
- Future expectations of other investment consultants (2016 Horizon Survey)
- U.S. Department of the Treasury bond rates
- Assumptions used by other large public retirement systems, based on the Public Fund Survey, published by the National Association of State Retirement Administrators (NASRA)
- Historical observations of price and wage growth statistics and investment returns

Actuarial Standard of Practice Number 27

Guidance regarding the selection of economic assumptions for measuring pension obligations is provided by Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. 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.

ASOP 27 requires the actuary to select a "reasonable" assumption. For this purpose, an assumption is reasonable if it has the following characteristics:

a. it is appropriate for the purpose of the measurement;

b. it reflects the actuary's professional judgment;

c. it takes into account historical and current economic data that is relevant as of the measurement date;

d. it reflects the actuary's estimate of future experience, the actuary's observation of the estimates inherent in market data, or a combination thereof; and

e. it has no significant bias (i.e., it is neither significantly optimistic nor pessimistic) except when provisions for adverse deviation or plan provisions that are difficult to measure are included.

With respect to relevant data, the standard recommends the actuary review appropriate recent and long-term historical economic data, but advises the actuary not to give undue weight to recent experience. Furthermore, it advises the actuary to consider that some historical economic data may not be appropriate for use in developing assumptions for future periods due to changes in the underlying environment. In addition, with respect to any particular valuation, each economic assumption should be consistent with all other economic assumptions over the measurement period.

ASOP 27 recognizes that economic data and analyses are available from a variety of sources, including representatives of the plan sponsor, investment advisors, economists, and other professionals. The actuary is permitted to incorporate the views of experts, but the selection or advice must reflect the actuary's professional judgment.

The standard also discusses a "range of reasonable assumptions" which in part states "the actuary should also recognize that different actuaries will apply professional judgment and may choose different reasonable assumptions." As a result, a range of reasonable assumptions may develop both for an individual actuary and across actuarial practice.

The remainder of this section will discuss the relevant types of economic assumptions used in the actuarial valuation to determine the obligations of OSERS. In our opinion, the economic assumptions recommended in this report have been developed in accordance with ASOP No. 27. The current and recommended set of economic assumptions are summarized in the following table:

	Current Assumptions	Recommended Assumptions
Price Inflation	3.00%	2.75%
Real Rate of Return	5.00%	4.75%
Investment Return	8.00%	7.50%
Price Inflation	3.00%	2.75%
Productivity	1.00%	0.50%
General Wage Growth	4.00%	3.25%
Payroll Growth	4.00%	3.25%
Interest on Contributions	3.00%	2.75%
Cost of Living	1.50%*	1.50%*

*Assumption is 1.00% for members hired on or after July 1, 2013.

Price Inflation

Use in the Valuation: Future price inflation has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, general wage growth (which then impacts individual salary increases), and payroll growth.

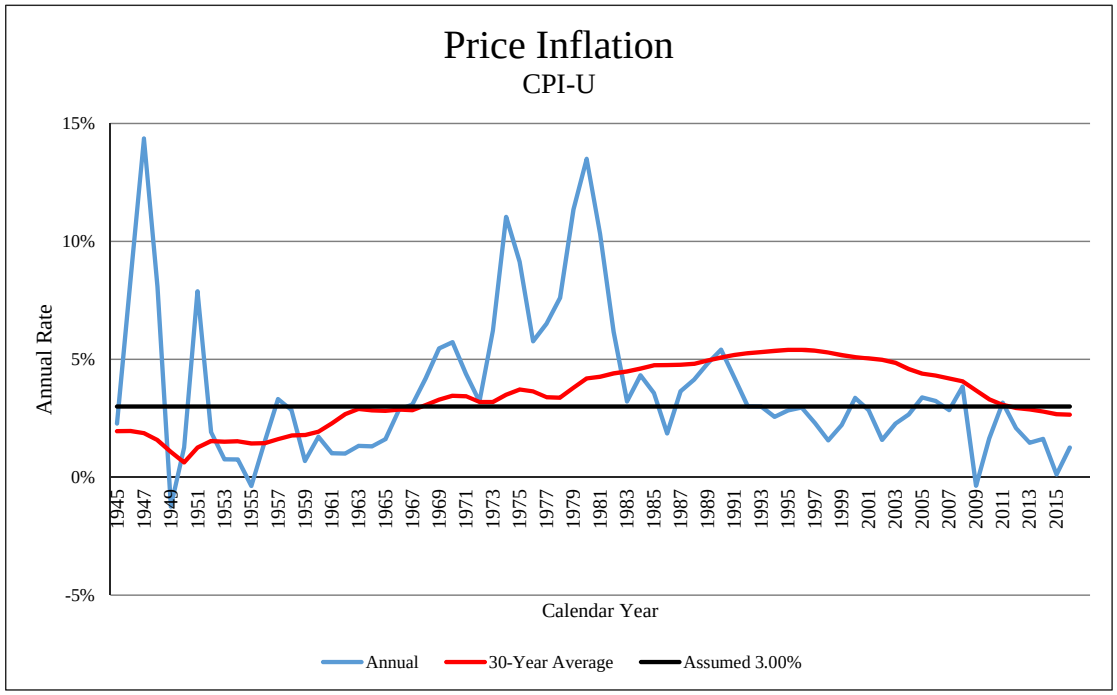
Price inflation also has a direct impact on the valuation results. OSERS' plan provisions provide for an annual cost of living adjustment of the lesser of 1.5% or CPI-U for members hired prior to July 1, 2013. For members hired on or after July 1, 2013, the annual cost of living adjustment is capped at 1.0% rather than 1.5%.

The current assumption for price inflation is 3.00% per year which was recommended and adopted in the last experience study.

Past Experience: Although economic activities, in general, and inflation in particular, do not lend themselves to prediction solely on the basis of historical analysis, historical patterns and long-term trends are factors to be considered in developing the inflation assumption. 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 following table provides historical annualized rates and annual standard deviations of the CPI-U over periods ending December 31st.

Period	Number of Years	Annualized Rate of Inflation	Annual Standard Deviation
1926 – 2016	90	2.94%	3.83%
1956 – 2016	60	3.70	2.75
1966 – 2016	50	4.09	2.82
1976 – 2016	40	3.66	2.77
1986 – 2016	30	2.65	1.22
1996 – 2016	20	2.15	1.04
2006 - 2016	10	1.76	1.29

The following graph illustrates the historical annual change in price inflation, measured as of December 31 for each of the last 70 years, as well as the thirty-year rolling average.



Over more recent periods, measured from December 31, 2016, the average annual rate of increase in the CPI-U has been below the current assumption of 3.00%. The period of high inflation from 1973 to 1982 has a significant impact on the averages over periods which include these rates. It is difficult to ignore the steady decline in inflation shown in the data above.

Forecasts of Inflation

Additional information to consider in formulating this assumption is obtained from measuring the spread on Treasury Inflation Protected Securities (TIPS) and from the prevailing economic forecasts. The spread between the nominal 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. Current market prices as of December 2016 suggest that investors expect inflation to be around 2.1% over the next 30 years. The bond market expectations may be heavily influenced by the low interest rate environment created by the Federal Reserve Bank's manipulation of the bond market. Whether inflation will return to the higher rates observed historically remains to be seen.

The NIC's investment consultant, Aon, also has an inflation forecast in their capital market assumptions. Both their short-term (10 year) and long-term (30 year) inflation assumption is 2.10%.

Social Security Projections

Although many economists forecast lower inflation than the assumptions used by retirement systems, they are generally looking at a shorter time horizon (10 years) than is appropriate for a pension valuation. To consider a longer, similar time frame, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the most recent report (May 2016), the projected average annual increase in the CPI over the next 75 years was estimated to be 2.6%, under the intermediate (best estimate) cost assumption. The range of price inflation used in the Social Security 75-year modeling, which includes a low and high cost scenario, in addition to the intermediate cost projection, was 2.0% to 3.2%.

Peer System Comparison

While we do not recommend the selection of any assumption based on what other systems use, it does provide another set of relevant information to consider. According to the Public Plan Database (a survey of over 150 state and local retirement systems maintained by a collaboration between the Center for Retirement Research at Boston College, the Center for State and Local Government Excellence, and the National Association of State Retirement Administrators) the average inflation assumption for statewide systems has been steadily declining. As of the most recent study, the most common assumption is 3.00%, which is consistent with OSERS' current assumption. However, the survey is based on valuations that are almost entirely from 2013 or 2014. Based on our experience, we believe that further declines have occurred for many systems in the last two years.

Conclusion: The current inflation assumption is 3.0%. While actuarial standards caution against assigning too much weight to recent experience, multiple factors lead us to believe the current inflation assumption should be reduced. Actual inflation for the last 30 years has been below 3.0%, the bond markets reflect an expectation of inflation well below 3.0%, the inflation assumption used by the Chief Actuary of the Social Security Administration in their 75-year projections is 2.6%, Aon's long-term inflation assumption is 2.10%, and the median long-term inflation assumption in the Horizon Actuarial Survey is 2.31%. While

the median inflation assumption in the Public Plans Database is 3.0%, this is based on assumptions used in 2014 valuations (likely trending lower since then).

Based on this information, **we recommend a reduction in the inflation assumption from 3.00% to 2.75%.**

Consumer Price Inflation	
Current Assumption	3.00%
Recommended Assumption	2.75%

COST OF LIVING ADJUSTMENTS

OSERS' plan design includes an annual COLA based on actual inflation up to 1.5% (members hired prior to July 1, 2013) or 1.0% (members hired on or after July 1, 2013). Based on the proposed inflation assumption of 2.75% and the expected variability, the assumption for members hired before July 1, 2013 is 1.5% and the assumption for those hired after July 1, 2013 is 1.0%.

INVESTMENT RETURN

Use in the Valuation: The investment return assumption reflects the anticipated returns on the current and future assets. It is one of the primary determinants in the calculation of the expected cost of the System's benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. This assumption has a direct impact on the calculation of liabilities, normal costs, and contribution rates. Generally, the investment return assumption should be set with consideration of the asset allocation policy, expected long term real rates of return on the specific asset classes, the underlying inflation rate, and any investment expenses, but is also impacted by the dynamics of the system along with the risk tolerance and preferences of the Board.

The current investment return assumption is 8.00% per year, net of all investment-related and administrative expenses. The 8.00% rate of return is referred to as the nominal rate of return and consists of two components. The first component is price inflation (previously discussed). Any excess return over price inflation is referred to as the real rate of return. The real rate of return, based on the current set of assumptions, is 5.00% (8.00% nominal return less 3.00% inflation).

ASOP 27 provides guidance to actuaries on the selection of economic assumptions used for measuring pension obligations. Our findings and analysis, following that ASOP, are discussed below.

Long Term Perspective

Because the economy is constantly changing, assumptions about what may occur in the near term are volatile. Asset managers and investment consultants usually focus on this near-term horizon so as to make prudent choices regarding how to invest the trust funds, i.e., asset allocation. For actuarial calculations, we typically consider very long periods of time as some current employees will still be receiving benefit payments more than 80 years from now. For example, a newly-hired teacher who is 25 years old may work

for 35 years, to age 60, and live another 30 years, to age 90. The retirement system would receive contributions for the first 35 years and then pay out benefits for the next 30 years. During the entire 65-year period, the system is investing assets on behalf of the member. For such a typical career employee, more than one-half of the investment income earned on assets accumulated to pay benefits is received after the employee retires. In addition, in an open plan like OSERS, the stream of benefit payments is continually increasing as new hires replace current members who leave covered employment due to death, termination of employment, and retirement. This difference in time horizon is frequently a source of debate and confusion when setting economic assumptions.

The long term asset allocation for the OSERS portfolio is the same as the Nebraska School Employees Retirement System and the investment responsibility for both plans rests with the NIC. Therefore, we believe it is appropriate to rely on the analysis that was performed in the fall of 2016 for the Nebraska Public Employees' Retirement System (NPERS) and set the investment return assumption for OSERS equal to that used for NPERS, 7.50%.

For completeness in this report, the analysis from the NPERS 2016 Experience Study report is included below.

Excerpt from NPERS 2016 Experience Study Report

Forward Looking Analysis: *ASOP 27 provides that the actuary may rely on outside experts in setting economic assumptions. As mentioned earlier, NPERS' assets are held and invested by the Nebraska Investment Council (NIC) who relies on a variety of internal experts and external consultants to assist with investing the funds. As part of their duties, the NIC has its investment consultant, Aon, periodically perform asset-liability studies, along with comprehensive reviews of the expected return of the various asset classes in which the NPERS portfolio is invested. We believe it is appropriate to consider the results of Aon's work as one factor in assessing expected future returns.*

We also recognize that there can be differences of opinion among investment professionals regarding future return expectations. Horizon Actuarial Services prepares an annual study in which they survey various investment advisors (29 were included in the 2015 study) and provide ranges of results as well as averages. This information provides an additional perspective on what a broad group of investment experts anticipate for future investment returns.

We do note that Aon recently completed a comprehensive Asset/Liability Study for the NIC. While the study did not recommend any changes to the current asset allocation, it did suggest that the NIC begin to consider some additional illiquid investment classes. If this leads to any significant change in the asset allocation of the portfolio, it may require us to revisit the recommendation for the investment return assumption.

Our forward looking analysis used the real rates of return in Aon's capital market assumptions from the first quarter of 2016 and NPERS' target asset allocation. Using projection results produces an expected range of real rates of return over a 50 year time horizon. Looking at one year's results produces an expected real return of 4.56%, but also has a high standard deviation or measurement of volatility. By expanding the time horizon, the average return does not change much, but the volatility declines significantly. The table below provides a summary of results.

Aon's Capital Market Assumptions							
Time Span In Years	Mean Real Return	Standard Deviation	Real Returns by Percentile				
			5th	25th	50th	75th	95th
1	5.28%	12.37%	-13.76%	-3.38%	4.56%	13.15%	26.77%
5	4.70	5.49	-4.07	0.93	4.56	8.32	13.97
10	4.63	3.88	-1.62	1.98	4.56	7.20	11.13
20	4.60	2.74	0.15	2.73	4.56	6.42	9.16
30	4.58	2.24	0.95	3.06	4.56	6.08	8.30
50	4.57	1.73	1.75	3.40	4.56	5.73	7.45

The percentile results are the percentage of random returns over the time span shown that are expected to be less than the amount indicated. Thus for the 10-year time span, 5% of the real rates of return are expected to be below negative 1.62% and 95% are expected to be above that. As the time span increases, the results begin to converge. Over a 50-year time span, the results indicate a 25% probability that real returns will be below 3.40% and a 25% probability they will be above 5.73%. There is a 50% probability that the real return will be 4.56% or above and a 50% probability that the real return will be below 4.56%.

For a broader view of expected returns, we used the average capital market assumptions of the 29 investment consultants included in the 2015 Horizon Actuarial Survey which yielded the following results:

2015 Horizon Actuarial Survey of Capital Market Assumptions							
Time Span In Years	Mean Real Return	Standard Deviation	Real Returns by Percentile				
			5th	25th	50th	75th	95th
1	5.80%	12.05%	-12.81%	-2.62%	5.13%	13.49%	26.67%
5	5.27	5.35	-3.30	1.59	5.13	8.79	14.28
10	5.20	3.78	-0.90	2.62	5.13	7.71	11.52
20	5.17	2.67	0.83	3.35	5.13	6.95	9.61
30	5.16	2.18	1.61	3.67	5.13	6.61	8.78
50	5.15	1.69	2.39	4.00	5.13	6.28	7.95

While we often assign greater weight to the capital market assumptions of a system's own investment advisor, we recognize that there are some aspects of the current investment environment that may be significantly different from the past. One approach in setting assumptions (which we believe to be used by Aon) is to base many of the fundamental market assumptions on the current Treasury yield curve. To this, adjustments are made for credit quality, liquidity, risk, etc. These models draw on historical spreads to help provide an estimate of current expectations. However, because of actions by governments and central banks around the world to influence interest rates, it is possible that the current pricing of Treasuries and other fixed income products may be artificially influenced. If this is the case, then the linkage from Treasuries on up in these capital market models may be different from the historical norms and the resulting assumptions may be distorted. However, because there is no way to prove or disprove this assertion at the

present time, we find some degree of confidence in looking at the pooled result of 29 investment firms, including most major investment consultants. Consequently, we believe there is value in considering both sets of capital market assumptions in our analysis.

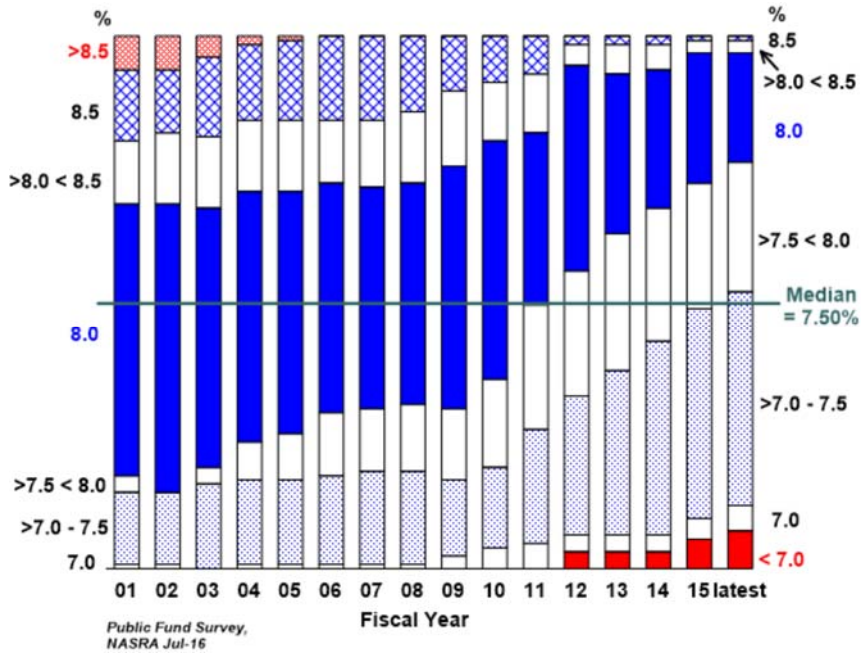
Frequently investment consultants develop their expected return assumptions based on a timeframe of 5 to 10 years. Therefore, those assumptions may not necessarily be appropriate for the longer timeframe used by actuaries (30 to 50 years). Since both Aon and the Horizon Survey have developed 20-year market return assumptions, the expected returns from their assumptions are reasonably in line with the timeframe used by actuaries. We also note that Aon updates their capital market assumption quarterly. Since we expect to perform an experience study only every four years, we are also hesitant to base our assumption solely on the most recent quarterly estimate from the investment consultants.

If the investment return assumption was set equal to the expected return based on the capital market assumptions each year or even in every experience study, it could create significant fluctuations in the system's funded ratio and the corresponding actuarial contribution rate. Our goal is to choose an assumption that will be reasonable over the long term (30 to 50 years) with adjustments only when there are compelling changes to investment policy, changes in the underlying inflation assumption, or evidence of a change in the long-term trends in the capital markets. We do not believe that we should automatically recommend changing the actuarial assumption up or down whenever Aon's capital market assumptions produce an expected return higher or lower than the current assumption. Additional analysis and discussion are needed before a change is implemented.

Peer System Comparison: *While we do not recommend the selection of an investment return assumption be based on the assumptions used by other systems, it does provide another set of relevant information to consider as long as we recognize that asset allocation varies from system to system. The following graph shows the change in the distribution of the investment return assumption from fiscal year 2001 through 2015 (and some 2016 information) for the 120+ large public retirement systems included in the National Association of State Retirement Administrators (NASRA) Public Fund Survey. The assumed rate of return is heavily influenced by the asset allocation of the system, so comparisons must be made cautiously.*

As the graph below indicates, the investment return assumptions used by public plans have decreased over the last decade, likely impacted by a corresponding decrease in the underlying inflation assumption from 4.0% to 3.0% over the same period. It is worth noting that the median investment return assumption in fiscal year 2012 dropped from 8.00% to 7.75% and has remained there for the last few years. However, as the graph indicates the number of systems using an assumption above 8.0% is very small. In addition, although 8.0% is still a commonly used assumption the number of systems using 8.0% has continued to decline since 2012. We believe we will continue to see more of the systems who are using an 8.0% or higher assumption move to a lower expected return as future experience studies are completed.

Change in distribution of investment return assumptions, FY 01 to present



Recommendation: *By actuarial standards we are required to maintain a long-term perspective in setting all assumptions, including the investment return assumption. Therefore, we believe we must be careful not to let recent experience or the short-term expectations impact our judgment regarding the appropriateness of the current assumption over the long term.*

This is a particularly challenging time to develop a recommendation for the investment return assumption. We need to recognize that there is no right answer to the question as no one knows what the future holds. After reviewing all of the available information, ***we recommend an investment return assumption of 7.50%****, based on the 2.75% inflation assumption and the 4.75% real rate of return (midway between the real returns obtained by using Aon's capital market assumption and the 2015 Horizon survey).*

End of Excerpt from NPERS Experience Study Report

GENERAL WAGE GROWTH

Background: General wage growth, thought of as the "across the board" rate of salary increases, is composed of the price inflation assumption and an assumption for the real rate of wage increases/real wage growth. The excess of wage growth over price inflation represents the increase in the standard of living, also called productivity growth.

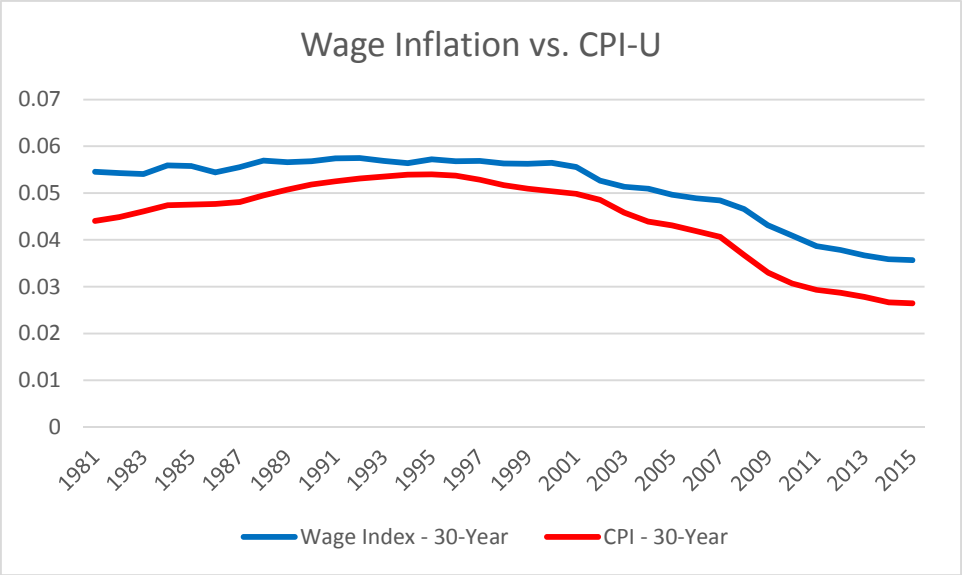
In constructing the salary increase assumption that is used to project future salary increases for individual members, the wage growth assumption is combined with an assumption for service-based salary increases (called a merit scale). The service-based salary increase assumption is addressed in the demographic assumptions section. Given the current price inflation assumption of 3.0%, the current wage growth assumption of 4.0% implies an assumed real rate of wage increase or real wage growth assumption of 1.0%.

Historical Perspective: Wage statistics from the Social Security System on the National Average Wage (1955 to present) are used because that is the most comprehensive database available. Because the National Average Wage is based on all wage earners in the country who are covered by Social Security, it can be influenced by the mix of jobs (full-time vs. part-time, manufacturing vs. service, etc.) as well as by changes in some segments of the workforce that are not seen in all segments (e.g. regional changes or growth in computer technology). Furthermore, if compensation is shifted between wages and benefits, the wage index would not accurately reflect increases in total compensation. OSERS membership is composed exclusively of school employees working in the Omaha metro area, whose wages and benefits are linked as a result of state and local tax revenues, funding allocations, and governing policies. Because the competition for workers can, in the long term, extend across industries and geography, the broad national earnings growth will have some impact on OSERS members. In the shorter term, however, the wage growth of OSERS and the nation may be less directly correlated.

The excess of wage growth over price inflation represents the real wage growth rate. The following table shows the compounded wage growth over various periods, along with the comparable price inflation rate for the same period. The differences represent the real wage growth rate. The data for each year is documented in Exhibit 3.

Years	Period	General Wage Inflation	CPI Increase	Real Wage Inflation
2006-2015	10	2.7%	1.8%	0.9%
1996-2015	20	3.4%	2.2%	1.2%
1986-2015	30	3.6%	2.7%	0.9%
1976-2015	40	4.4%	3.7%	0.7%
1966-2015	50	4.8%	4.1%	0.7%
1956-2015	60	4.6%	3.7%	0.9%

Similar information over rolling thirty year periods is shown in the following graph:



Over the last 30 years, the real wage increase, as measured by the increase in the National Average Wage Index, has been 0.87% per year on average. A somewhat similar, but slight different set of data is available from the Bureau of Labor Statistics, which reports the median weekly wage for full-time employees. Over the last 30 years, this amount (adjusted for inflation) has had an average increase of 0.17% per year. Part of the difference in these results arises from the difference between using an average and a median. There are also technical differences arising from who is included in each measure.

Forecasts of Future Wages: The wage index used for the historical analysis is projected forward by the Office of the Chief Actuary of the Social Security Administration in their 75-year projections. In the June, 2016 Trustees Report, the annual increase in the National Average Wage Index under the intermediate cost assumption (best estimate) was 3.8%, 1.2% higher than the Social Security Administration's intermediate inflation assumption of 2.6% per year. The range of the assumed real wage growth in the 2016 Trustees report was 0.5% to 1.8% per year.

Analysis and Conclusion: Over the last 30 years, the actual experience on a national basis has been close to the current assumption. However, this is based on SSA data which uses the average wages of all US workers. As mentioned earlier, the median real wage increase has been significantly lower. We believe that wages will continue to grow at a greater rate than prices over the long term, although not at the level projected by Social Security. We also expect wage growth for governmental employees, including OSERS employees, to be lower than the national average, at least in the short term, due to budget challenges still being experienced by both state and local governmental employers.

Based on the available data and our professional judgment, **we recommend that the long-term assumed real wage growth be lowered from 1.00% to 0.50% per year. When coupled with the reduction in the price inflation assumption to 2.75%, the resulting general wage growth assumption decreases from 4.00% to 3.25%.**

GROWTH IN MEMBERSHIP

We propose continuing the assumption that no future growth in membership will occur. This assumption affects the amortization payment rate, which is the portion of the total contributions used to pay off the unfunded actuarial liability. With no assumed growth in membership, future salary growth due only to general wage increases is anticipated. If increases should occur not only because of wage increases, but also because of additional members, there will be a larger pool of salaries over which to spread the unfunded actuarial liability, which would result in lower UAL payments as a percent of payroll. The uncertainties in light of current conditions in public employment and the national economy argue against anticipating any increase in membership for funding purposes.

PAYROLL GROWTH ASSUMPTION

Amortization payments on the unfunded actuarial liability are currently determined as a level percent of payroll. Therefore, the valuation requires an assumption regarding future annual increases in covered payroll. The wage growth assumption is typically used for this purpose. The current payroll growth assumption for OSERS is 4.00%, the same as the current wage growth assumption.

Based on the recommended wage growth assumption of 3.25%, we recommend the payroll growth assumption also be set at 3.25%. The use of a lower payroll growth assumption, like 3.00%, would provide some conservatism in the funding of the UAL by effectively increasing the dollar amounts of contributions in the earlier years of the amortization period. If the Board is interested in considering this option, we would be happy to discuss it with them.

SUMMARY

The following table summarizes the current set of economic assumptions along with the recommended set of economic assumptions:

	Current Assumptions	Recommended Assumptions
Price Inflation	3.00%	2.75%
Investment Return	8.00%	7.50%
Cost of Living Adjustment	1.50%*	1.50%*
Interest on Member Accounts	3.00%	2.75%
General Wage Growth	4.00%	3.25%
Payroll Growth	4.00%	3.25%

*****Assumption is 1.00% for members hired on or after July 1, 2013.

DEMOGRAPHIC ASSUMPTIONS

Actuarial Standard of Practice No. 35 (ASOP 35) provides guidance to actuaries regarding the selection of demographic and other non-economic assumptions for measuring pension obligations. ASOP 35 states that the actuary should use professional judgment to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgment. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

The actuary should follow the following steps in selecting the demographic assumptions:

1. Identify the types of assumptions. Types of demographic assumptions include but are not limited to retirement, mortality, termination of employment, disability, election of optional forms of payment, administrative expenses, family composition, and treatment of missing or incomplete data. The actuary should consider the purpose and nature of the measurement, the materiality of each assumption, and the characteristics of the covered group in determining which types of assumptions should be incorporated into the actuarial model.

2. Consider the relevant assumption universe. The relevant assumption universe includes experience studies or published tables based on the experience of other representative populations, the experience of the plan sponsor, the effects of plan design, and general trends.

3. Consider the assumption format. The assumption format includes whether assumptions are based on parameters such as gender, age or service. The actuary should consider the impact the format may have on the results, the availability of relevant information, the potential to model anticipated plan experience, and the size of the covered population.

4. Select the specific assumptions. In selecting an assumption the actuary should consider the potential impact of future plan design as well as the factors listed above.

5. Evaluate the reasonableness of the selected assumption. The assumption should be expected to appropriately model the contingency being measured. The assumption should not be anticipated to produce significant actuarial gains or losses.

ASOP 35 General Considerations and Application: Each individual demographic assumption should satisfy the criteria of ASOP 35. In selecting demographic assumptions, the actuary should also consider the internal consistency between the assumptions, materiality, cost effectiveness, and the combined effect of all assumptions. At each measurement date the actuary should consider whether the selected assumptions continue to be reasonable, but the actuary is not required to do a complete assumption study at each measurement date. In addition, ASOP 35 requires the actuary to include a specific assumption with respect to expected mortality improvements after the measurement date. In our opinion, the demographic assumptions recommended in this report have been developed in accordance with ASOP 35.

Overview of Analysis: The purpose of a study of demographic experience is to compare what actually happened to the individual members of the System during the study period (September 1, 2012 through August 31, 2016) with what was expected to happen based on the actuarial assumptions. Four years is a relatively short observation period for experience given the assumptions are being set with a long-term time horizon in mind. Therefore, we have considered the results of the prior Experience Study when practical to do so.

It takes a fair amount of data to provide experience study results that are fully credible for demographic assumptions. Because the membership or certain subsets of the membership are relatively small, some assumptions have been selected based more on our professional judgment of reasonable future outcomes than actual experience. Furthermore, a single study period is a relatively short observation period, particularly given the size of OSERS' membership. Therefore, the System's size limits the credibility of the findings, particularly when the total group is split into subsets such as certificated/classified and/or male/female. Our recommendations were made, taking these factors into account.

Studies of demographic experience generally involve three steps:

- First, the number of members changing membership status, called decrements, during the study is tabulated by age, duration, gender, group, and membership class as appropriate (active, retired, etc.).

- Next, the number of members expected to change status is calculated by multiplying certain membership statistics, called exposure, by the expected rates of decrement.

- Finally, the number of actual decrements is compared with the number of expected decrements. The comparison is called the actual to expected ratio (A/E Ratio), and is expressed as a percentage.

In general, if the actual experience differs significantly from the overall expected results, or if the pattern of actual decrements, or rates of decrement, by age, sex, or duration deviates significantly from the expected pattern, new assumptions are considered. Recommended revisions are normally not an exact representation of the experience during the observation period. Judgment is required to anticipate future experience from past trends and current evidence, including a determination of the amount of weight (credibility) to assign to the most recent experience.

In our analysis, we use a methodology to analyze the experience that we call a liability-weighted approach. The relative liability of the member is approximated by using the member's compensation and years of service to estimate the benefit level. The exposure and actual occurrences are then multiplied by the benefit level to provide the liability-weighted experience. (For retiree mortality, the weight is simply the benefit amount.) This approach is particularly insightful when analyzing experience in a non-homogenous group. While we reviewed experience on both a count and liability-weighted basis, we have generally found the liability-weighted experience to be a better basis for setting assumptions. Therefore, in most situations we assign more credibility to the liability-weighted results in evaluating experience and developing new assumptions, if necessary.

Revised rates of decrement are tested by recalculating the expected number of decrements during the study period, with results shown as revised A/E Ratios.

ASOP 35 states that the actuary should use professional judgment to estimate possible future outcomes based on past experience and future expectations, and select assumptions based upon application of that professional judgment. The actuary should select reasonable demographic assumptions in light of the particular characteristics of the defined benefit plan that is the subject of the measurement. A reasonable assumption is one that is expected to appropriately model the contingency being measured and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

	Recommended Revisions	
	Certificated	Classified
Mortality	Yes	Yes
Retirement	Yes	Yes
Termination of Employment	Yes	Yes
Probability of Refund	No	Yes
Merit Salary Scale	Yes	Yes

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MORTALITY

One of the most important demographic assumptions in the valuation is mortality because it projects the length of time benefits are expected to be paid to current and future retirees and beneficiaries. If members live longer than expected, the true cost of future benefit obligations will be understated.

Over the last few generations, rates of mortality have been declining, meaning people are generally living longer. Furthermore, the experience of large, public retirement systems that include school employees indicates that school groups, and teachers in particular, continue to exhibit better mortality than the average working population.

There are distinct differences in the mortality rates of males and females, healthy retired members, disabled retired members and non-retired members. Because of those differences in mortality, these groups are generally studied separately.

Actuaries use various adjustments to standard mortality tables in order to match the observed mortality rates of a specific retirement system:

(1) Age adjustments
(2) Collar adjustment
(3) Scaling of rates

The first of these adjustments is an age adjustment that can be either a "setback" or a "set forward". A one-year age setback treats all members as if they were one year younger than they truly are when applying the rates in the mortality table. So, a one year set back would treat a 61 year old retiree as if he will exhibit the mortality of a 60 year old in the standard mortality table.

The second adjustment is called a collar adjustment. There are both "white collar" and "blue collar" variants of some of the newer mortality tables. These variants, which are not necessarily limited to populations that have only white or blue collar employees, provide options which may result in a better fit of the assumed mortality to actual experience.

The third adjustment that may be used, depending on the size of the group, is to "scale" a mortality table by multiplying the probabilities of death by factors less than one (to reflect better mortality) or factors greater than one (to reflect poorer mortality). Scaling factors can be applied to an entire table or a portion of the table. Of course, if needed, actuaries may use two or even all three of these methods to develop an appropriate table to model the mortality of the specific plan population.

The issue of future mortality improvement is one that the actuarial profession has become increasingly focused on studying with the intent to remain on the leading edge of the issue. This has resulted in changes to the relevant Actuarial Standard of Practice, ASOP 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. This ASOP requires the pension actuary to make and disclose a specific recommendation with respect to future improvements in mortality after the valuation date, although it does not require that an actuary assume there will be future improvements. There have been significant improvements in longevity in the past, although there are different opinions about future expectations. We believe it is prudent to anticipate that the trend will continue to some degree in the future. Therefore, we believe it is appropriate to reflect some future mortality improvement as part of the mortality assumption.

There are two widely-used ways to reflect future improvements in mortality:

(1) Static table with "margin"
(2) Generational mortality

The first approach to reflecting mortality improvements is through the use of a static mortality table with "margin." Under this approach, the A/E ratio is intentionally targeted to be over 100% so that mortality can improve without creating actuarial losses. This approach is mandated by the Internal Revenue Service for determining minimum funding amounts for corporate pension plans as mortality improvements are projected seven years for retirees and 15 years for actives. While there is no formal guideline for the amount of margin required (how far above 100% is appropriate for the A/E ratio), we typically prefer to have a margin of around 10% at the core retirement ages. The goal is still for the general shape of the curve to be a reasonable fit to the observed experience. Depending on the magnitude and duration of mortality improvement, the margin would decrease and eventually may become insufficient. When that occurs, the assumption would need to be updated.

Another approach, referred to as generational mortality, directly anticipates future improvements in mortality by using a different set of mortality rates for each year of birth, with the rates for later years of birth assuming lower mortality than the rates for earlier years of birth. The varying mortality rates by year of birth create a series of tables that contain "built-in" mortality improvements, e.g., a member who turns age 65 in 2035 has a longer life expectancy than a member who turns age 65 in 2020. When using generational mortality, the A/E ratios for the observed experience are set near 100% as future mortality improvements will be taken into account directly in the actuarial valuation process.

The table below is an example using a standard table, showing the life expectancy at age 65, an indication of how long a new retiree would expect to receive monthly payments, at various points in time.

	Life Expectancy	
Year	Male	Female
2016	22.7	24.6
2026	23.0	25.0
2036	23.4	25.3
2046	23.7	25.6

Life expectancy at age 65 in years

We would note that there is a wide range of opinions with respect to future expectations of mortality and the underlying assumptions regarding mortality improvement reflect some subjectivity. However, most public plan actuaries are in agreement that some improvement is likely to occur. The real question is how much it will improve and how rapidly.

The valuation currently uses generational mortality with separate mortality assumptions for male and female members. The RP-2000 Combined Mortality Table for Males and Females, and no age adjustment for males and a one-year age setback for females (e.g. a female member age 65 is assumed to exhibit the mortality of a 64 year old) is used to predict the probability of death in each future year. Projection Scale AA is used to anticipate mortality improvements in future years.

In examining the results of the Experience Study, if the A/E Ratio is greater than 100% the assumptions have predicted fewer deaths than actually occurred (generally an actuarial gain) and with an A/E Ratio less than 100% the assumptions have predicted more deaths than have actually occurred (generally an actuarial loss). Since generational mortality is being used, the A/E Ratio should be around 100% as mortality improvements in future years are directly reflected in the valuation process by projecting lower mortality rates in future years.

Healthy Retiree Mortality – Males: The following table shows the exposures, actual deaths, and expected deaths for the key retirement ages of 60 to 85, along with the actual to expected ratio under the current assumption for each year in the experience study on both a count and benefit-weighted basis. The variation from year to year is evident; however, this is not unexpected given the size of the group.

				A/E Ratio	
	Exposure	Actual	Expected	Count	Weighted
Year 1	931	21	23	91%	95%
Year 2	981	37	25	148%	140%
Year 3	999	27	25	108%	94%
Year 4	1,032	25	27	93%	80%
Total	**3,943**	**110**	**100**	**110%**	**101%**

In the prior experience study, the A/E ratio for males using the current assumption was 94%. The current experience study indicates that the current assumption for male retirees is predicting too few deaths on a count basis, i.e., the A/E ratio is more than 100%. However, of more relevance, is the fact that the A/E ratio is near 100% when experience is weighted based on benefit amounts. This indicates that the amount of liability actually being released as a result of retiree deaths over the study period was close to that anticipated.

Healthy Retiree Mortality – Females: The following chart shows the exposures, actual deaths, and expected deaths for ages 60 to 85, along with the actual to expected ratio under the current assumption for each year in the experience study on both a count and benefit-weighted basis. As was observed for males, the experience varies significantly from year to year. Again, this is to be expected given the size of the group.

				A/E Ratio	
	Exposure	Actual	Expected	Count	Weighted
Year 1	2,148	46	39	118%	146%
Year 2	2,226	34	40	85%	73%
Year 3	2,365	30	43	70%	60%
Year 4	2,541	50	47	106%	99%
Total	**9,280**	**160**	**170**	**94%**	**93%**

The experience for females indicates that the current assumption anticipated more deaths than actually occurred for female retirees on both a count and benefit-weighted basis. Since both of the A/E ratios are well below 100%, it indicates that the mortality assumption for females needs to be strengthened.

Although the mortality assumption for males was a relatively good fit for the actual experience in this study period, we prefer to keep both males and females on a consistent set of mortality tables. Therefore, we are recommending that the mortality assumption for both males and females be changed. In trying to find a new mortality assumption, we first tried the new mortality assumption for the Nebraska School Employees Retirement System (NSERS), adopted by the PERB at their October, 2016 meeting. Our analysis indicated that the NSERS assumption was not appropriate for the OSERS population.

We next attempted to find a standard mortality table with age or collar adjustments that would be a good fit for the observed experience at all ages, with a focus on the key retirement ages of 60 to 85. A relatively new mortality table, denoted as the RP-2014 Mortality Table, was published by the Society of Actuaries (SOA) in October of 2014. It was created to replace the RP-2000 Mortality Table as the mortality table required for use in the valuation of corporate pension plans. The RP-2014 Mortality Table with a one-year age set forward for males and a one-year age setback for females was a reasonably good fit to the actual experience as shown below:

	A/E Ratio	
	Count Basis	Benefit-Weighted
Males	105%	97%
Females	102%	100%

With generational mortality, once the base mortality rates are set by selecting a mortality table that fits the actual experience during the study period, future mortality improvements must be addressed by selecting a mortality improvement scale. A mortality improvement projection scale, MP-2014, was published with the RP-2014 Mortality Table for use in projecting future mortality improvements. Using additional years of data, the projection scale was updated in both 2015 and 2016 and published as the MP-2015 scale and MP-2016 scale. The MP-2016 scale, which was published with the RP-2014 Mortality Table is a two dimensional projection scale and varies not only by age, but also by year of birth, increasing the sophistication of the projections to more accurately model the broad mortality improvements observed in the United States.

We recommend the RP-2014 Mortality Table be used with a one-year age set forward for male retirees and a one-year age setback for females retirees with generational mortality improvements anticipated by the MP-2016 projection scale. We do not recommend that the projection scale be modified each year as new versions are published, but that the MP-2016 Scale be used until the next experience study is completed.

Beneficiaries: The mortality of beneficiaries applies to the survivors of members who receive a joint and survivor option. There are fewer members receiving benefits under the joint and survivor options which can produce more volatility in the observed mortality rates. Based on the limited data, **we recommend standard convention be followed and the same mortality assumption be used for beneficiaries as is used for retired members.**

Post-retirement Mortality for Disabled Members: The valuation assumes that disabled members, in general, will not live as long as retired members who met the regular service retirement eligibility. In addition, future life expectancies for disabled members are not expected to increase as significantly as the future life expectancies for healthy retirees.

Because of the limited number of exposures and deaths for disabled members, it makes sense to use the standard disabled table that is the companion to the retiree mortality table. **We recommend the RP-2014 Disabled Retiree Mortality Table be used without generational improvement.**

Active Members: This assumption predicts eligibility for active member death benefits prior to retirement, rather than the expected lifetime for pension payments. In smaller groups, the mortality rates for active members are often set by using a consistent basis as is used for healthy retirees. Given the low probability of death while active, the results cannot be credible on their own without much larger numbers of employees than are in OSERS. We prefer to keep the mortality assumption for active and retired members on a consistent basis. **Therefore, we recommend the active member mortality be set to the RP-2014 Mortality Table for males (with a one-year set forward) and females (with a one-year set back) and applying the MP-2016 Scale for future mortality improvements.**

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SERVICE RETIREMENT

Service retirement measures the change in status from active membership directly to retirement. This assumption does not include the retirement patterns of members who terminated from active membership years prior to their retirement. A separate assumption addresses that situation.

Members who were eligible to retire during the study period could retire with reduced benefits at age 55 with ten years of service. Special early retirement factors of 3% per year are applied if the member meets the Rule of 82, 83 or 84 (age plus service equals or exceeds 82, 83 or 84). Unreduced benefits are available if a member meets one of the following:

(1) the Rule of 85,
(2) age 62 with ten years of service, or
(3) age 65 with five years of service.

The following table is a summary of the actual service retirements in each category for Certificated members for the period September 1, 2012 through August 31, 2016:

Certificated Retirement Experience

Retirements Observations	Actual	Expected	A/E Ratio Count	A/E Ratio Weighted
Rule of 82	8	17	47%	48%
Rule of 83	4	16	25%	24%
Rule of 84	6	15	40%	40%
Early (Reduced)	70	89	79%	87%
Select (First Eligible)	123	147	84%	95%
Ultimate	247	269	92%	92%

Due to the economic conditions during the prior experience study, there were no changes to the retirement assumptions. However, based on our review of that data and the findings of the current study, we are recommending several changes to the retirement assumptions for Certificated members.

- The number of actual retirements under the Rule of 82, 83 and 84 has been very small in both the current and prior experience study. Therefore, we recommend the separate assumption for retirement under those eligibility requirements be eliminated.
- Early retirement usage is fairly low, but some small adjustments are recommended to better fit the actual experience.
- Adjustments to the rates at first retirement (select) are recommended with an increase at age 55 and decreases at certain later ages.
- The retirement rates for the ultimate retirement assumption are adjusted with both increases and decreases at various ages.

The following table summarizes the resulting A/E ratios using the recommended assumptions:

Certificated Experience

	A/E Ratio			
	Current		Proposed	
Assumption	Count	Weighted	Count	Weighted
Early	79%*	87%*	86%	97%
Select	84%	95%	96%	102%
Ultimate	92%	92%	91%	92%

* Excludes members eligible for Rule of 82, 83 or 84.

The following table is a summary of the actual service retirements in each category for Classified members for the period September 1, 2012 through August 31, 2016:

Classified Retirement Experience

Retirements				
	Observations			
	Actual	Expected	A/E Ratio Count	A/E Ratio Weighted
Early (Reduced)	48	55	87%	84%
Select	51	81	62%	72%
Ultimate	240	313	77%	92%

Based on these results, we believe some adjustment to the retirement assumptions is appropriate. Therefore, we are recommending the following changes:

- Early retirement: reduce the rate at age 61
- Select (first eligible): lower rates from ages 60 through 65
- Ultimate assumption: adjust rates to better reflect experience resulting in both increases and decreases at various ages

Classified Experience

	A/E Ratio			
	Current		Proposed	
Assumption	Count	Weighted	Count	Weighted
Early	87%	84%	98%	94%
Select	63%	72%	81%	90%
Ultimate	77%	92%	81%	100%

Inactive Vested Members: The current assumption is that inactive vested members will retire at the first retirement date at which they are eligible for unreduced benefits. Due to the limited number of exposure, actual analysis was not performed. This is a reasonable expectation and **we recommend the current assumption be retained.**

TERMINATION OF EMPLOYMENT

Not all active members on the valuation date are expected to continue working until retirement. Therefore, a termination of employment assumption is used to anticipate the probability that a member will leave covered employment at any given age. In analyzing the actual results, the number of terminations includes all members reported to have terminated employment. Some of these members subsequently receive refunds of their contributions, some return to active membership and some leave their contributions with the System until retirement and receive a monthly benefit. Explicit assumptions are made regarding the elections made by such terminated vested members. Non-vested members are assumed to elect a refund of their employee contribution account balance.

This section of the report summarizes the results of our study of terminations of employment for reasons other than death, retirement, or disability. Rates of termination can vary by both age and years of service. In general, rates of termination tend to be highest at younger ages and in the early years of employment. The current termination of employment assumption reflects a five year select and ultimate approach, i.e. one set of rates apply to the first five years of employment (service) and a different set of rates apply once a member has five or more years of service. Both the select and ultimate rates are currently age-based assumptions.

The following table shows the actual and expected number of terminations for causes other than death, retirement, or disability, and the corresponding A/E ratios.

	Certificated - Males			
	Actual	**Expected**	**Count**	**Weighted**
Years of Service				
Less than 5	134	109	123%	118%
5 or more	94	61	154%	149%
Total	228	170	134%	143%

	Certificated – Females			
	Actual	**Expected**	**Count**	**Weighted**
Years of Service				
Less than 5	352	380	93%	87%
5 or more	326	212	154%	98%
Total	678	592	115%	96%

	Classified – Males			
	Actual	**Expected**	**Count**	**Weighted**
Years of Service				
Less than 5	87	64	136%	86%
5 or more	38	20	190%	134%
Total	125	84	149%	122%

	Classified – Females			
	Actual	**Expected**	**Count**	**Weighted**
Years of Service				
Less than 5	282	264	107%	88%
5 or more	164	52	315%	123%
Total	446	316	141%	112%

Our review of the current assumptions indicated they were not a particularly good fit for the actual experience observed during the study period. Therefore, some adjustment to the current assumptions is necessary and appropriate. In general, there tends to be a stronger correlation between termination rates and years of service rather than age. Therefore, we analyzed the actual OSERS experience on a pure service-based analysis. While reviewing the results, we noted that there was not a major difference between the pattern for males and females in the certificated group so we considered the experience of both groups together. The typical pattern observed in other systems was evident in this data as well, i.e., highest termination rates in the lowest years of service, declining significantly over a 10-15 year period followed by very low rates. For the classified group, separate assumptions were developed by gender as there were distinct differences by gender in the actual experience.

Based on the data we observed, we believe that a set of termination rates based solely on years of service is likely to better model the termination patterns of active members than the current select and ultimate age-based assumptions. Therefore, we developed a new assumption for each group, certificated and classified, based on the actual experience during this period. The revised A/E ratios using the recommended assumptions are summarized below:

	A/E Ratio	
	Count	Weighted
Certificated	99%	87%
Classified - Males	127%	86%
Classified – Females	111%	91%

Since the recommended assumption is based solely on the experience of a single study period, it will likely need to be refined in future experience studies as additional data becomes available.

VESTED MEMBER ELECTION OF REFUND/DEFERRED BENEFIT

Some members who terminate active employment elect to receive a distribution of their member account balance. Currently, we assume that all non-vested members receive a refund of their account balance at the time of termination. In addition, we assume that a certain portion of terminating vested members also elect a distribution of their member account, thus forfeiting the right to receive a monthly benefit in the future.

Currently, separate assumptions are used for each group. For the Certificated group, 20% of terminating members are assumed to take a refund and 80% are assumed to leave their employee account balance in the System and draw a monthly benefit when eligible. For the Classified group, 50% are assumed to elect a refund of their employee account balance and forfeit any monthly income and 50% are assumed to leave their funds with the System. The following table shows the number of vested members who terminated and elected to leave their funds with the System along with the expected count during the study period.

	Election of Deferred Benefit		
	Actual	**Expected**	**A/E Ratio**
Certificated	354	316	112%
Classified	111	87	128%
Total	465	403	115%

There were more terminated vested members who elected to leave their contributions in the System and receive a monthly benefit at retirement eligibility than was anticipated by the current assumption for both groups. This election can be heavily influenced by the economic conditions during the study period. The current assumption for Certificated members was adopted in the last experience study and produced an A/E ratio of 103%. The results in the current study are still in a reasonable range, given the size of the group.

There was no change in this assumption for Classified members in the last study although the A/E ratio was 108%. Given the experience in this study, we are recommending the assumption be modified to assume that 60% of all terminating members will elect to leave their money in the System and later receive a monthly benefit. Based on the recommended rates, the revised A/E ratio for Classified members is 107%.

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SALARY INCREASE ASSUMPTION

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 (often called merit scale), and
2. Increases in the general wage level of the membership, which are directly related to price and wage inflation.

Earlier in this report, we recommended that the second of these rates, general wage inflation, be lowered to 3.25% (2.75% price inflation and 0.50% real wage growth).

As noted above, future salary increases are the result of two components. Actual salary experience is reported in total, rather than by components, so the experience study reviewed total salary increases for the study period. There continues to be considerable pressure on the school district's budget which may have had an impact on the salary increases observed in the study period. In our study, we compared individual salary increases for any member active in any two consecutive periods (e.g. 2012 and 2013, 2013 and 2014, etc.). The average actual increase during this period was 4.30% for Certificated members while the expected increase was 5.06%. The actual increase for Classified members was 4.45% while the expected increase was 4.40%.

The following table shows the salary experience by year:

2012 – 2016 SALARY EXPERIENCE						
	Certificated			Classified		
Year End	Actual	Expected	A/E Ratio	Actual	Expected	A/E Ratio
2013	3.96%	5.05%	78%	4.68%	4.40%	106%
2014	3.87%	5.05%	77%	3.14%	4.41%	71%
2015	5.91%	5.07%	117%	4.25%	4.40%	97%
2016	3.48%	5.08%	69%	5.69%	4.40%	129%
Total	4.30%	5.06%	85%	4.45%	4.40%	101%

We would note that actual inflation was around 1.25% compared to the assumption of 3.0% during this period. Likewise, the general wage growth for the entire country was around 3.0% compared to the current assumption of 4.0%. Therefore, we expected to observe actual salary increases that were lower than expected, based on the current assumption. While this was true for the certificated group, it was not the case for the classified group.

As we dug deeper into the data and reviewed the salary increases by year, some unusual patterns were observed. For example, the salary increases for certificated employees for the 2014-2015 year displayed significant increases in the earlier durations (years 1 to 15) while the data for the 2015-2016 year showed much higher increases than expected at the higher durations (over 20 years of service). With only four years of data in the study, we decided that additional analysis and information was needed. A review of the current contract with the Omaha Education Association (OEA) revealed a significant change in the Long Service Increment (LSI) pay in 2015-2016 which explained the pattern observed in the data. Given the dramatic change in the LSI component of the merit salary scale we are not comfortable using the data

from the study period to develop an assumption. It is more common for the salary increase assumption to be duration based given the strong correlation of service and pay. Our recommendation is to move to a service-based assumption for the certificated group which was developed based on the salary schedules and LSI in the current OEA contract. Additional refinements to the assumption will be needed in future years as more data becomes available.

Our review of the salary data for the classified group identified one year with very high salary increases (2015-16). Because it appeared to be an outlier, that year was excluded from the data in developing the service-based assumption. As with the salary increase assumption for certificated employees, additional refinements to the assumption will be needed in future years as additional analysis on a service-basis is performed.

MISCELLANEOUS ASSUMPTIONS

There are several minor assumptions used in the valuation process that do not have a material impact on the valuation results. These include:

(1) Interest on employee contributions
(2) Percent of members married at retirement
(3) Age difference between spouses

Prior to September 1, 2016, the Board had full discretion to set the interest rate credited on employee contributions each year. However, the current state statutes provide that the interest rate credited on employee contributions is the rate equal to the daily treasury yield curve for one-year treasury securities on September 1 of each year. This rate is expected to be correlated to price inflation so **we recommend the current assumption of 3% be lowered to 2.75%, the price inflation assumption**.

The valuation assumes that all members are married at retirement and female spouses are three years younger than male spouses. These assumptions are used to value ancillary benefits and do not have a large impact on the valuation results. While we did not specifically review these assumptions in detail, **we believe they are reasonable and should continue to be used**. Changes in these assumptions would have a relatively minor impact of the liabilities and costs of the System.

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Interest Rate: 8.0% per annum, compounded annually, net of expenses.

Mortality Rates: RP-2000 Combined Mortality Table for males.
RP-2000 Combined Mortality Table for females, set back one year.

Future mortality rates are projected on a generational basis using Scale AA, which reflects the expectation that mortality rates will decline over time.

Disabled retirees use the same assumptions as healthy retirees with ages set forward ten years.

Disability: None assumed.

Termination of Employment: (prior to retirement eligibility) Illustrative rates of termination are as follows:

Certificated:

Age	Percent Terminating (First 5 Years) Male	Female
20	10.0%	13.0%
25	10.0	13.0
30	10.0	13.0
35	9.8	10.5
40	9.0	9.0
45	9.0	6.0
50	9.0	5.0

Age	Percent Terminating (Over 5 Years) Male	Female
25	8.0%	9.0%
30	7.0	9.0
35	3.5	6.0
40	2.3	2.5
45	1.0	2.5
50	1.0	1.0

Classified:

Percent Terminating (First 5 Years)		
Age	Male	Female
20	25.0%	30.0%
25	20.0	27.0
30	14.0	20.0
35	5.0	15.0
40	5.0	10.0
45	5.0	9.0
50	4.0	9.0

Percent Terminating (Over 5 Years)		
Age	Male	Female
25	8.0%	18.0%
30	8.0	13.0
35	4.4	6.0
40	2.2	3.8
45	1.4	3.8
50	1.0	3.0

Retirement Rates: Early retirement rates are assumed to occur according to the schedule illustrated below:

Certificated:

Age	Early	84 Points	83 Points	82 Points
55	10%	55%	40%	30%
56	5	55	40	30
57	5	40	40	30
58	5	40	20	10
59	10	40	20	10
60	10	40	40	30
61	20	20	10	30

Classified:

Age	Early
55	3%
56	3
57	3
58	3
59	3
60	3
61	20

Unreduced (age 62 or 85 points) retirement rates are assumed to occur according to the schedule illustrated below:

Certificated:

Age	1st Year Eligible	Ultimate
55	50%	
56	50	30%
57	50	30
58	45	30
59	45	30
60	45	20
61	45	30
62	30	30
63	60	30
64	35	35
65	35	35
66	35	25
67	35	20
68	35	20
69	100	40
70	100	100

Classified:

Age	1st Year Eligible	Ultimate
55	20%	
56	10	15%
57	10	15
58	10	15
59	15	15
60	35	15
61	20	20
62	20	30
63	50	20
64	30	20
65	30	35
66	20	30
67	20	20
68	20	20
69	20	20
70	100	100

Deferred vested members are assumed to retire at first unreduced retirement age.

Salary Scale: Salaries are assumed to increase according to the schedule illustrated below:

	Annual Salary Increase	
Age	Certificated	Classified
20	5.6%	4.7%
25	5.6	4.7
30	5.6	4.7
35	5.6	4.7
40	5.6	4.7
45	5.0	4.7
50	4.6	4.5
55	4.3	4.3
60	4.1	4.1
65	4.0	4.0
70	4.0	4.0

Pre-Retirement Survivor Annuity: It is assumed that females are three years younger than males, and that all members are married.

Probability of Electing a Refund: The proportion of terminating vested members electing a refund of member contributions.

20% for Certificated members
50% for Classified members

Assumed Interest Rate Credited on Employee Contributions: 3.00% compounded annually.

Inflation (CPI): 3.00% compounded annually.

Total Payroll Growth: 4.00% compounded annually.

Decrement Timing: Middle of year

Cost of Living Adjustments: 1.5% for members hired before 7/1/2013
1.0% for members hired on or after 7/1/2013

Interest Rate: 7.50% per annum, compounded annually, net of expenses.

Mortality Rates: RP-2014 Mortality Table for males, set forward one year.
RP-2014 Mortality Table for females, set back one year.

Future mortality rates are projected on a generational basis using Scale MP-2016, which reflects the expectation that mortality rates will decline over time.

Disabled retirees use the RP-2014 Disabled Retiree Mortality Table, without generational improvement.

Disability: None assumed.

Termination of Employment: (prior to retirement eligibility) Illustrative rates of termination are as follows:

Certificated:

Duration	Percent Terminating Rate
1	11.25%
5	8.00
10	4.50
15	2.25
20	1.00
25	1.00

Classified:

Duration	Percent Terminating Male	Female
1	11.00%	15.00%
5	6.00	9.00
10	2.40	4.00
15	1.00	1.75
20	1.00	1.00
25	1.00	1.00

Retirement Rates: Early retirement rates are assumed to occur according to the schedule illustrated below:

Certificated:

Age	Early
55	10%
56	6
57	6
58	6
59	8
60	12
61	12

Classified:

Age	Early
55	3%
56	3
57	3
58	3
59	3
60	5
61	10

Unreduced (age 62 or 85 points) retirement rates are assumed to occur according to the schedule illustrated below:

Certificated:

Age	1st Year Eligible	Ultimate
55	60%	
56	50	35%
57	45	35
58	45	35
59	45	25
60	35	25
61	25	25
62	25	25
63	25	25
64	30	30
65	35	35
66	35	35
67	35	35
68	35	35
69	100	35
70	100	100

Classified:

Age	1st Year Eligible	Ultimate
55	20%	
56	10	12%
57	10	12
58	10	12
59	15	12
60	15	12
61	15	20
62	20	20
63	20	20
64	20	20
65	25	35
66	20	23
67	20	23
68	20	23
69	20	23
70	100	100

Deferred vested members are assumed to retire at first unreduced retirement age.

Salary Scale: Salaries are assumed to increase according to the schedule illustrated below:

	Annual Salary Increase	
Duration	Certificated	Classified
0	5.75%	6.25%
1	5.75	5.75
2	5.75	5.25
3	5.75	5.00
4-6	5.75	4.75
7-11	5.75	4.25
12-14	5.75	3.75
15-21	5.25	3.75
22+	4.25	3.75

Pre-Retirement Survivor Annuity: It is assumed that females are three years younger than males, and that all members are married.

Probability of Electing a Refund: The proportion of terminating vested members electing a refund of member contributions:

20% for Certificated members
40% for Classified members

Assumed Interest Rate Credited on Employee Contributions: 2.75% compounded annually.

Inflation (CPI): 2.75% compounded annually.

Total Payroll Growth: 3.25% compounded annually.

Decrement Timing: Middle of year

Cost of Living Adjustments: 1.5% for members hired before 7/1/2013
1.0% for members hired on or after 7/1/2013

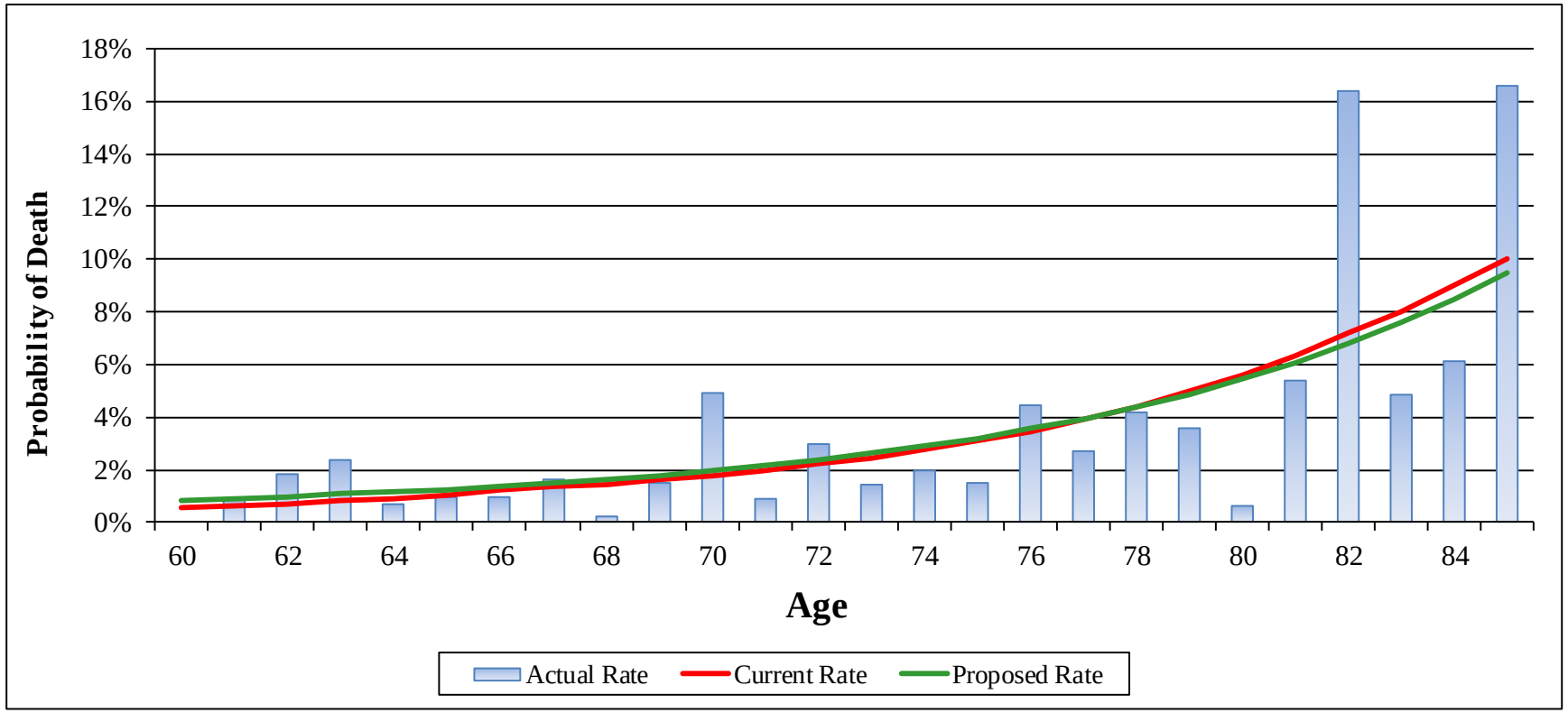
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-1

Probability of Death - Healthy Retirees

Males



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	225,076	222,144	232,936
Actual/Expected		101%	97%

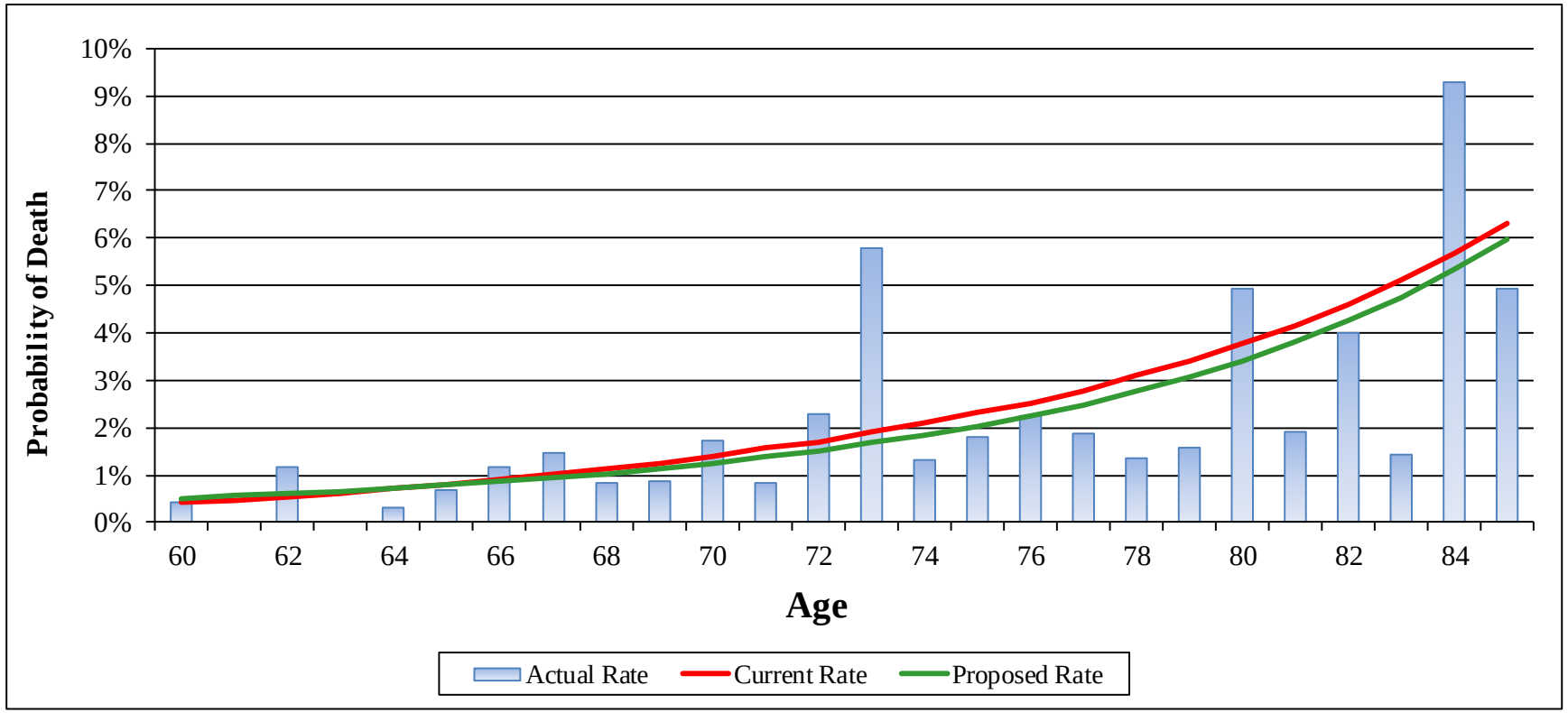
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-2

Probability of Death - Healthy Retirees

Females



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	270,725	290,694	269,734
Actual/Expected		93%	100%

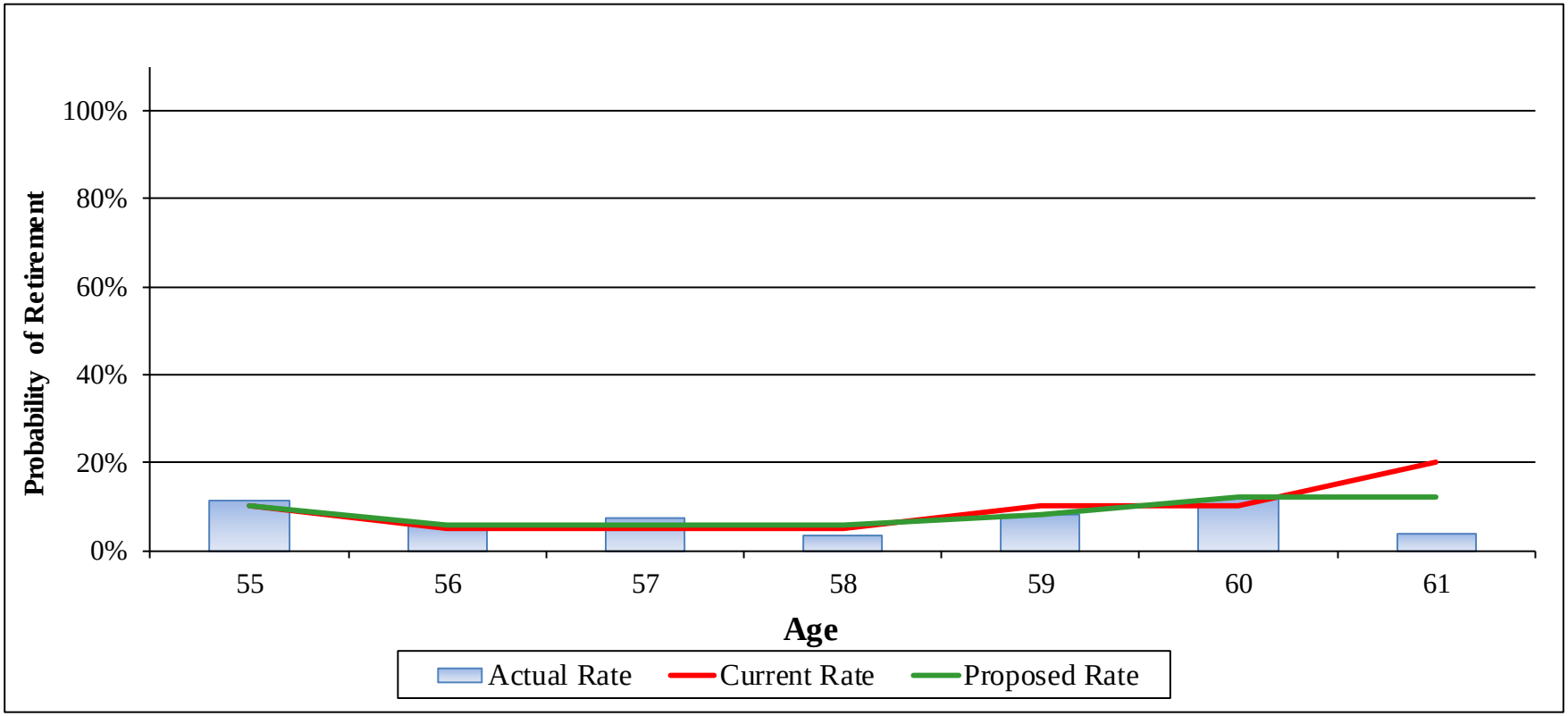
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-3

Retirement Rates

Certificated - Early



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	96	97	98
Actual/Expected		98%	97%

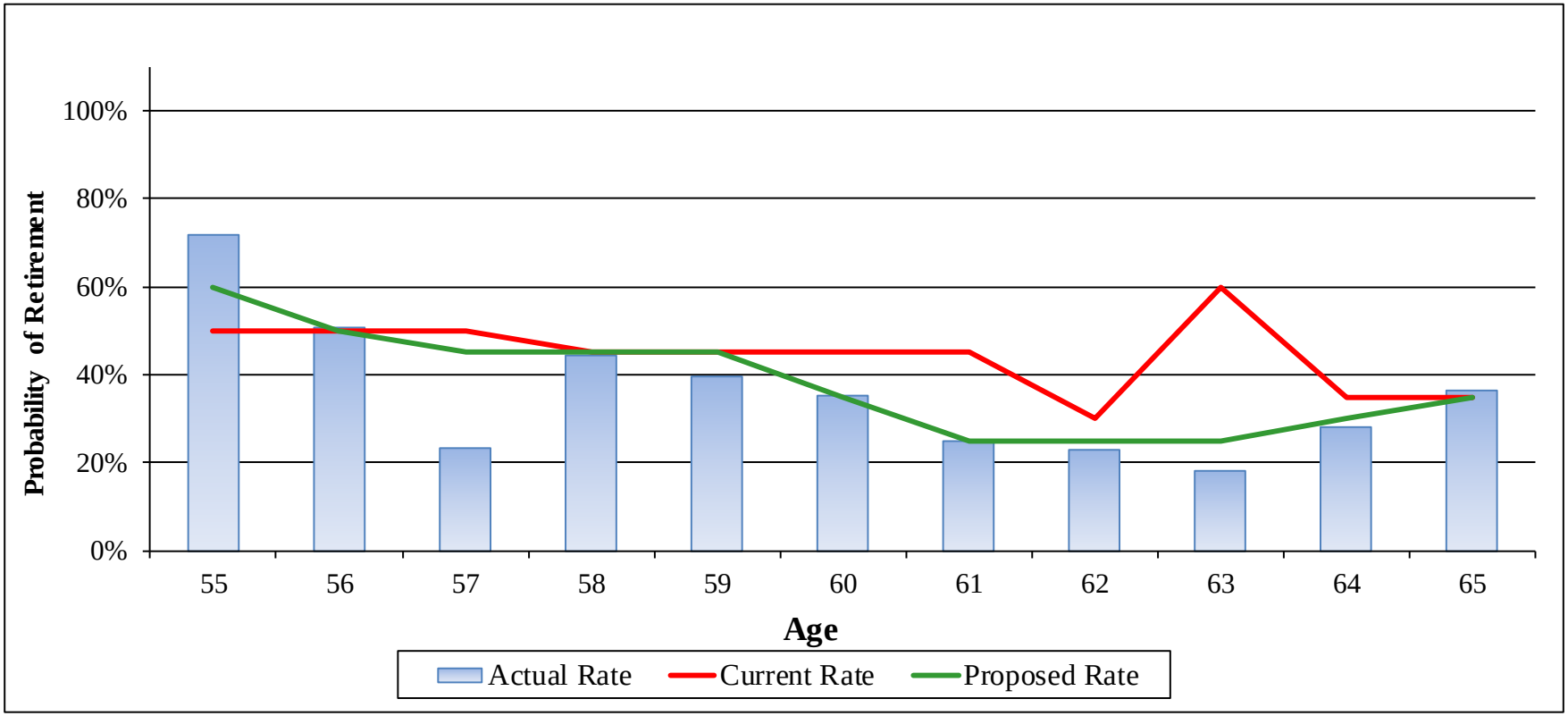
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-4

Retirement Rates

Certificated - Select



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	190	201	187
Actual/Expected		95%	102%

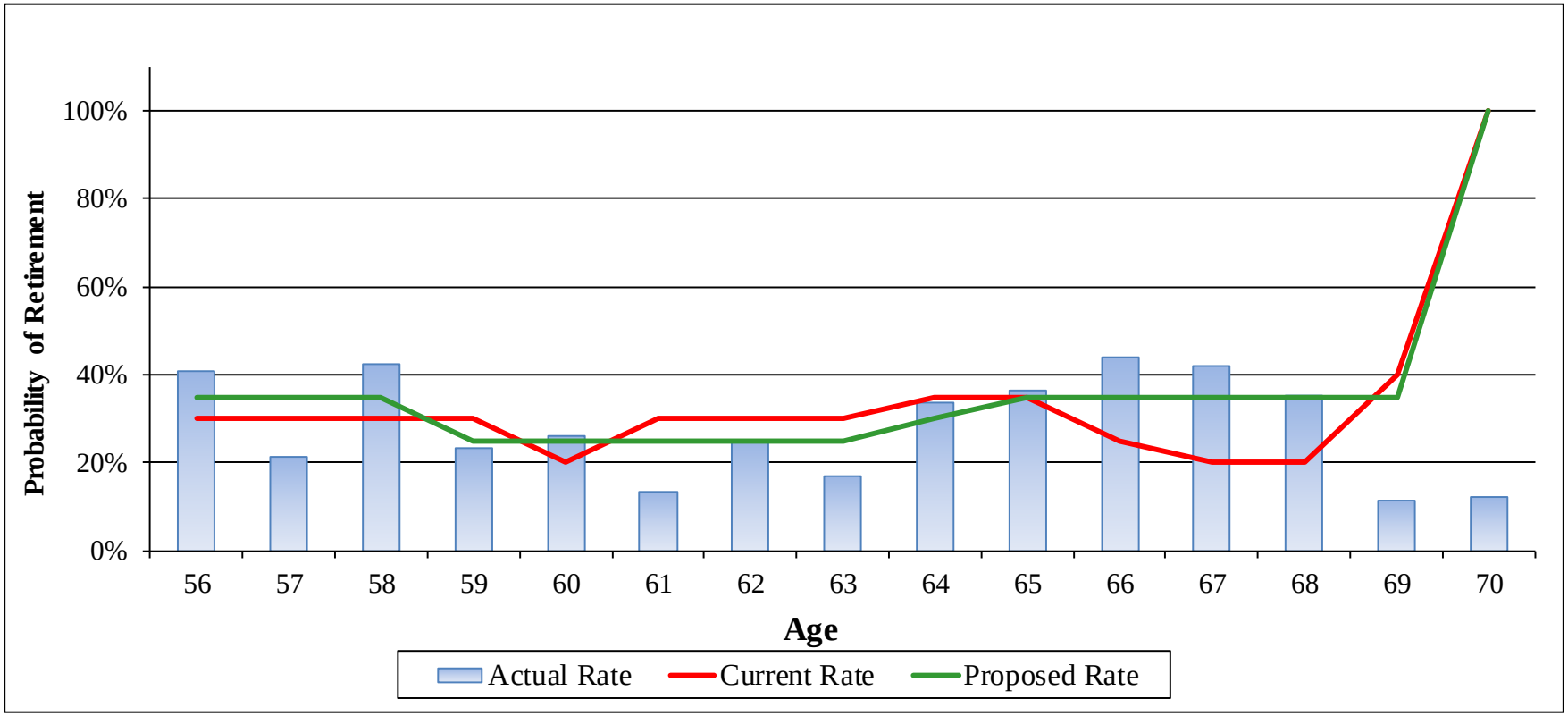
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-5

Retirement Rates

Certificated - Ultimate



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	438	473	475
Actual/Expected		92%	92%

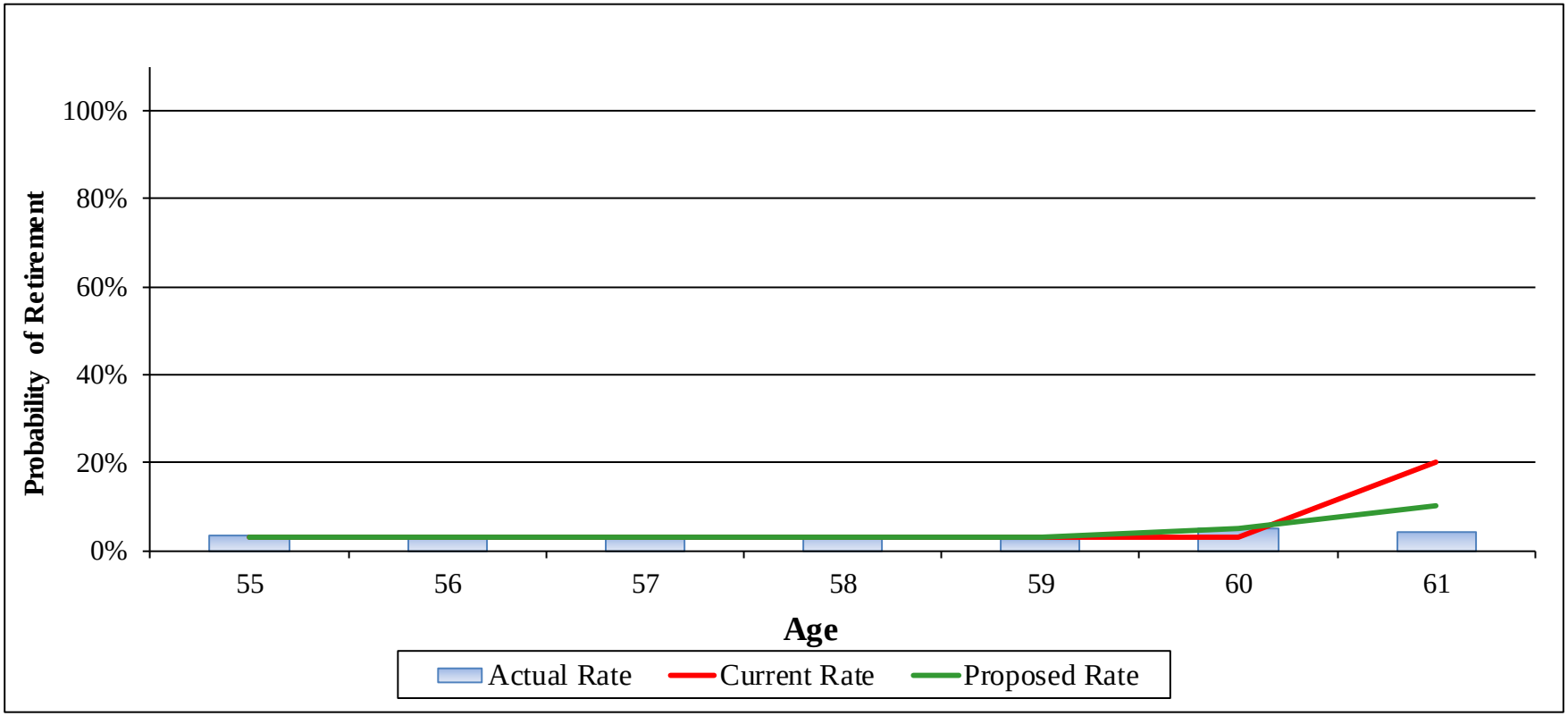
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-6

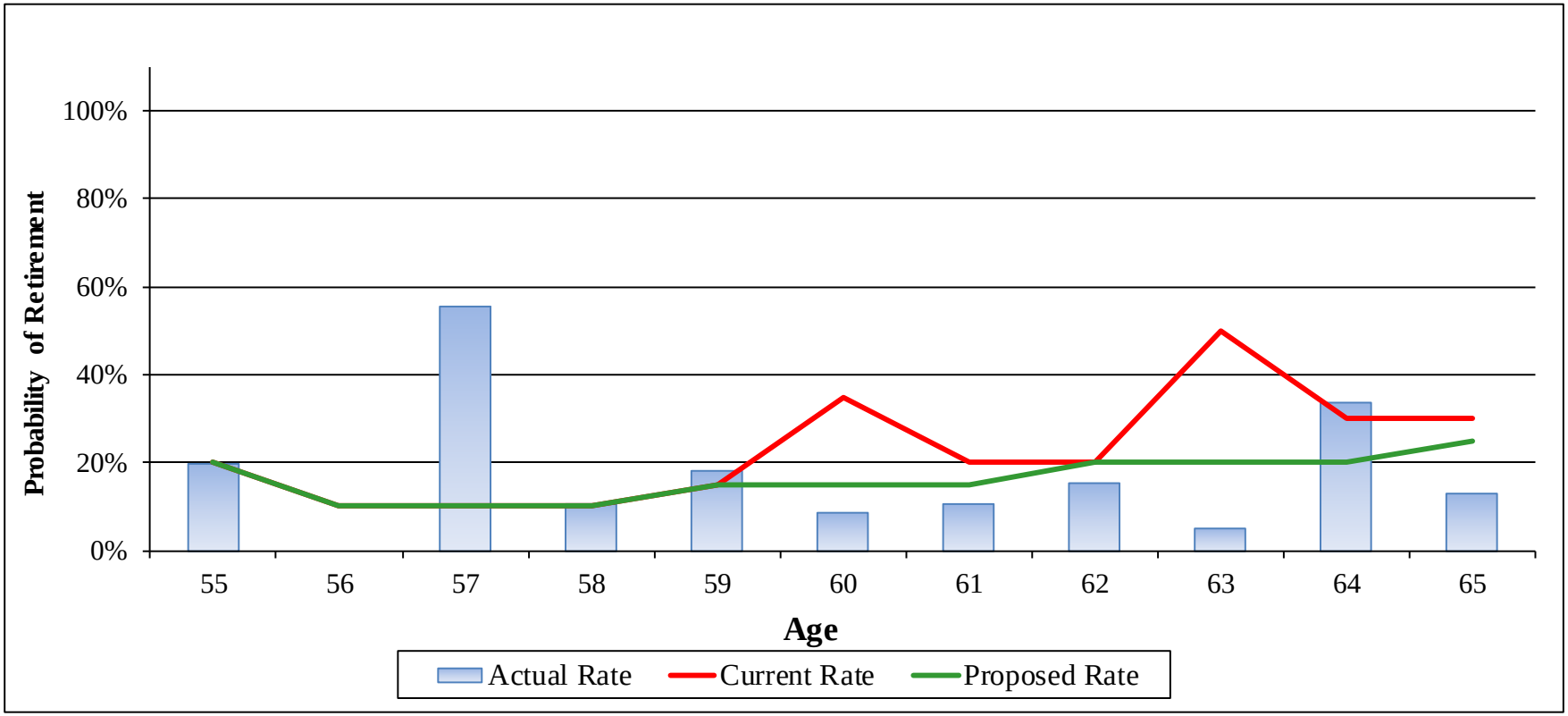
Retirement Rates

Classified - Early



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	21	24	22
Actual/Expected		84%	94%

Omaha Schools
Experience Study 2012 - 2016
Exhibit C-7
Retirement Rates
Classified - Select



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	23	32	26
Actual/Expected		72%	90%

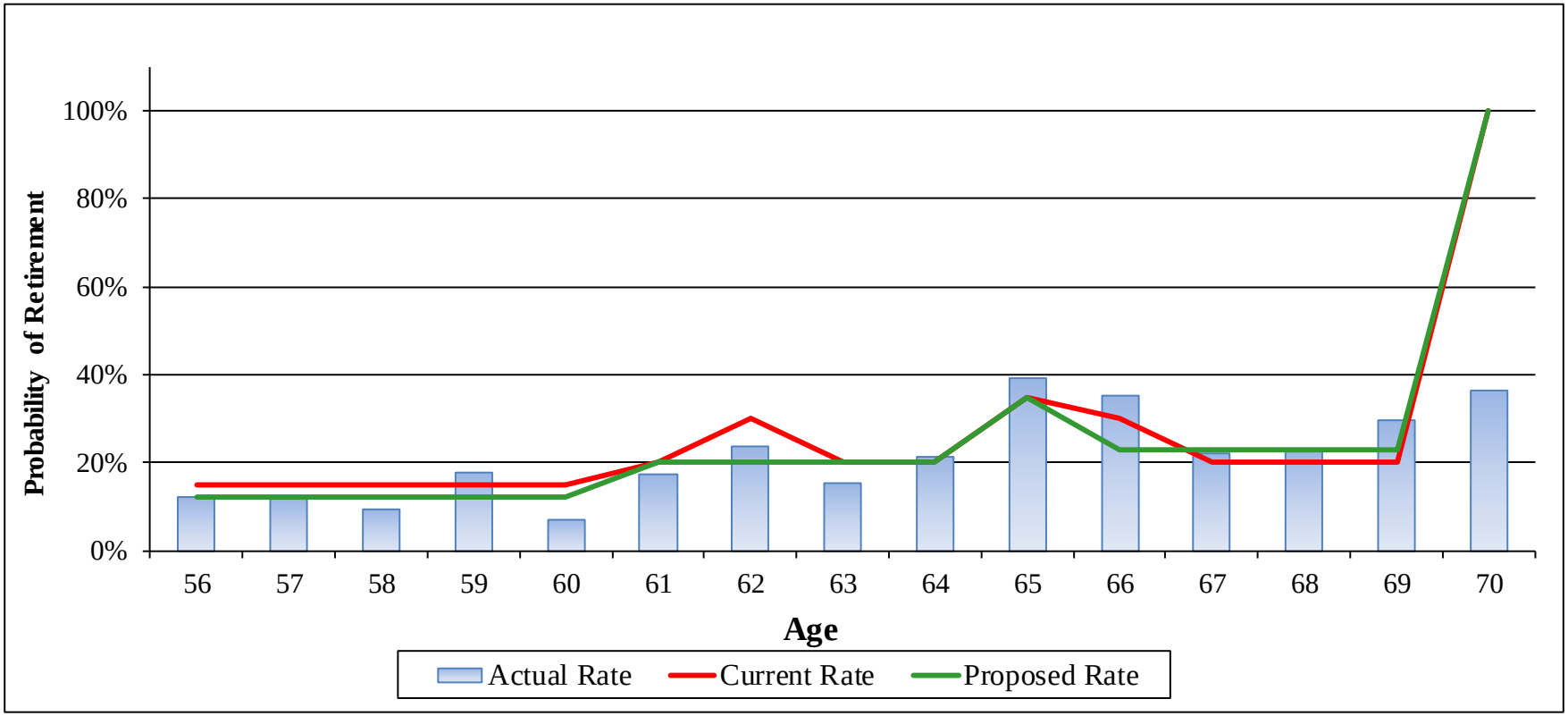
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-8

Retirement Rates

Classified - Ultimate



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Weighted Count	161	175	161
Actual/Expected		92%	100%

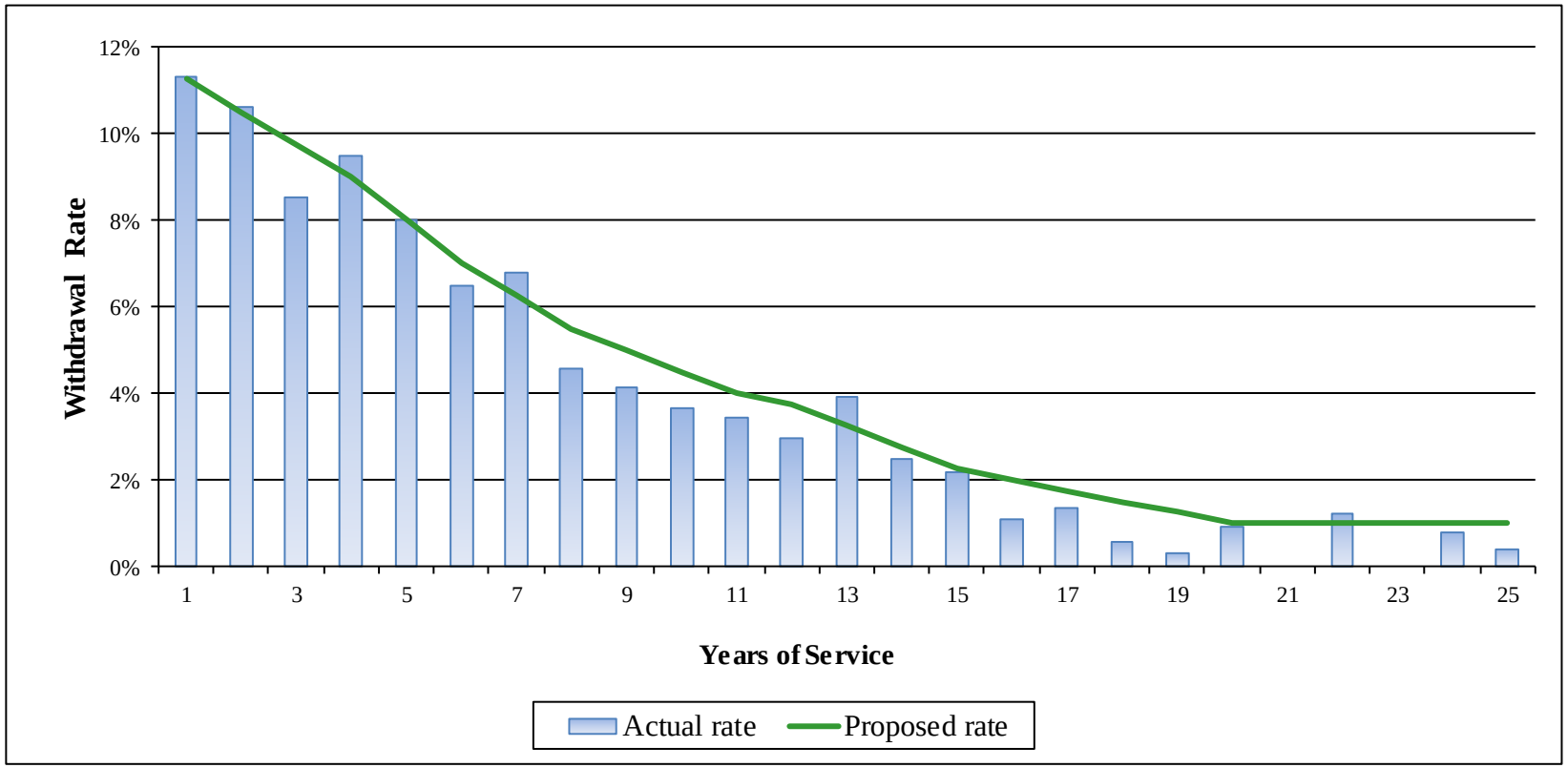
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-9

Rate of Termination of Employment

Certificated



	Actual	Expected - Proposed Assumptions
Weighted Count	2,383	2,743
Actual/Expected		87%

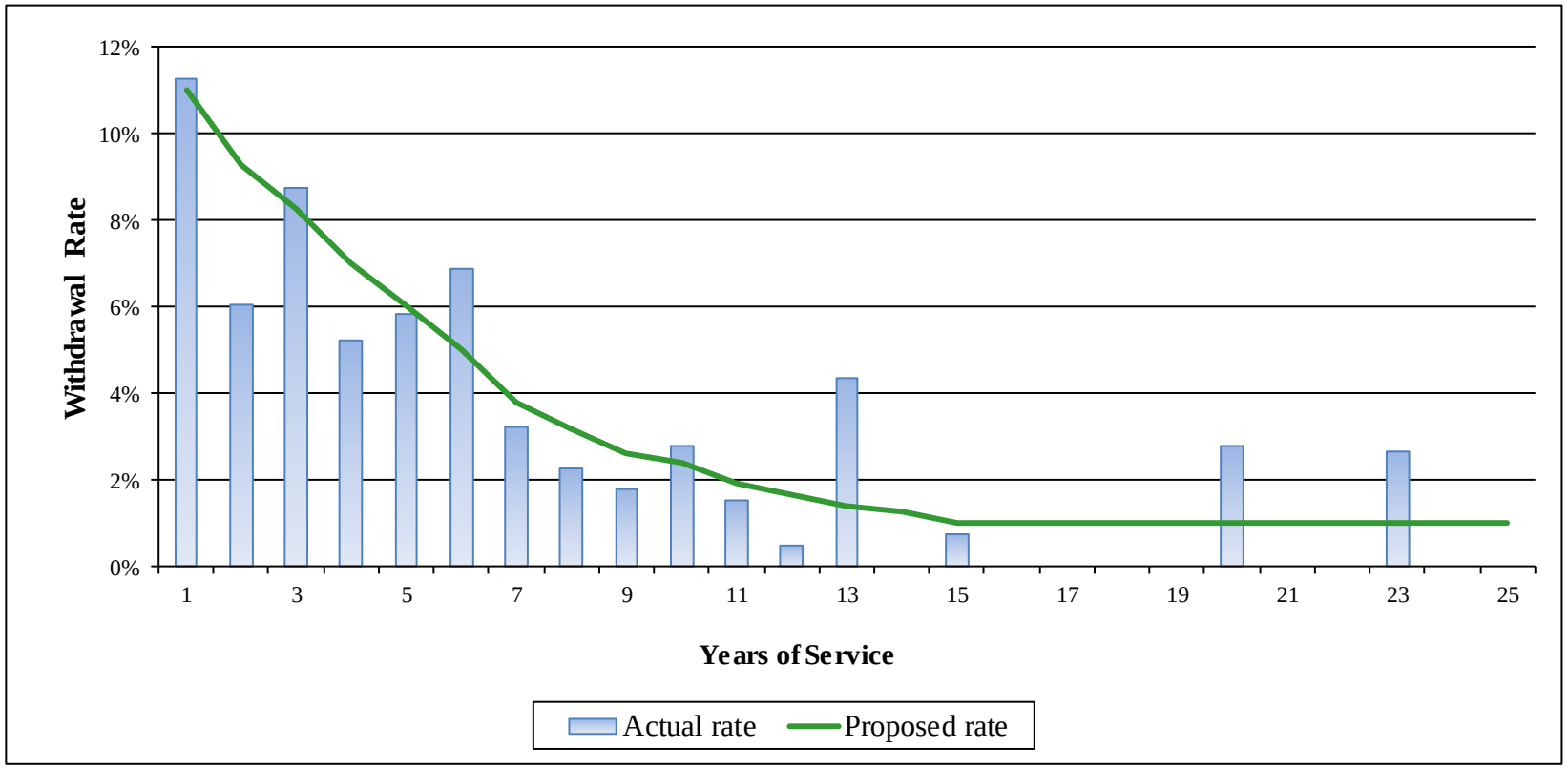
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-10

Rate of Termination of Employment

Classified - Males



	Actual	Expected - Proposed Assumptions
Weighted Count	160	186
Actual/Expected		86%

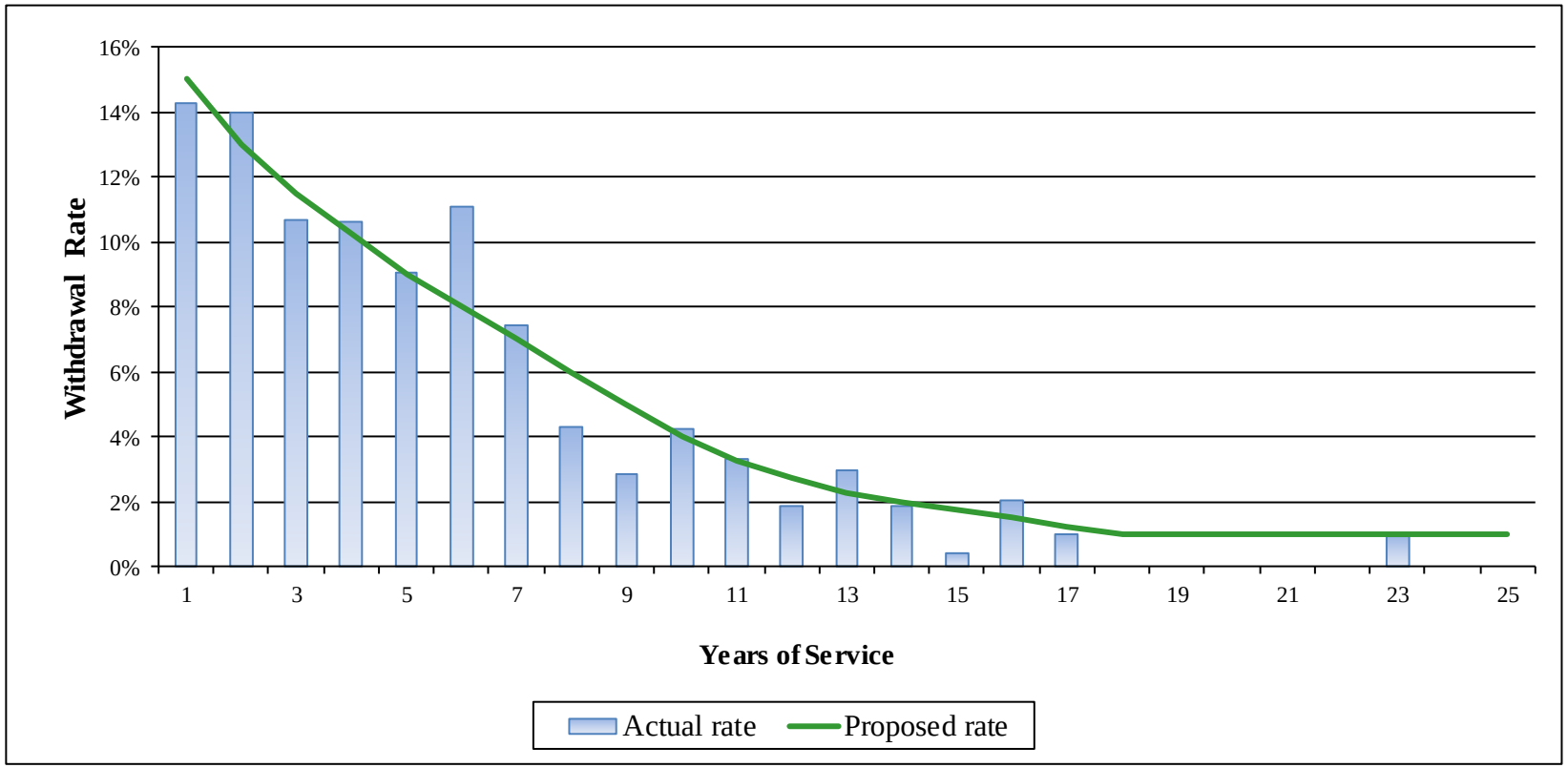
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-11

Rate of Termination of Employment

Classified - Females



	Actual	Expected - Proposed Assumptions
Weighted Count	422	464
Actual/Expected		91%

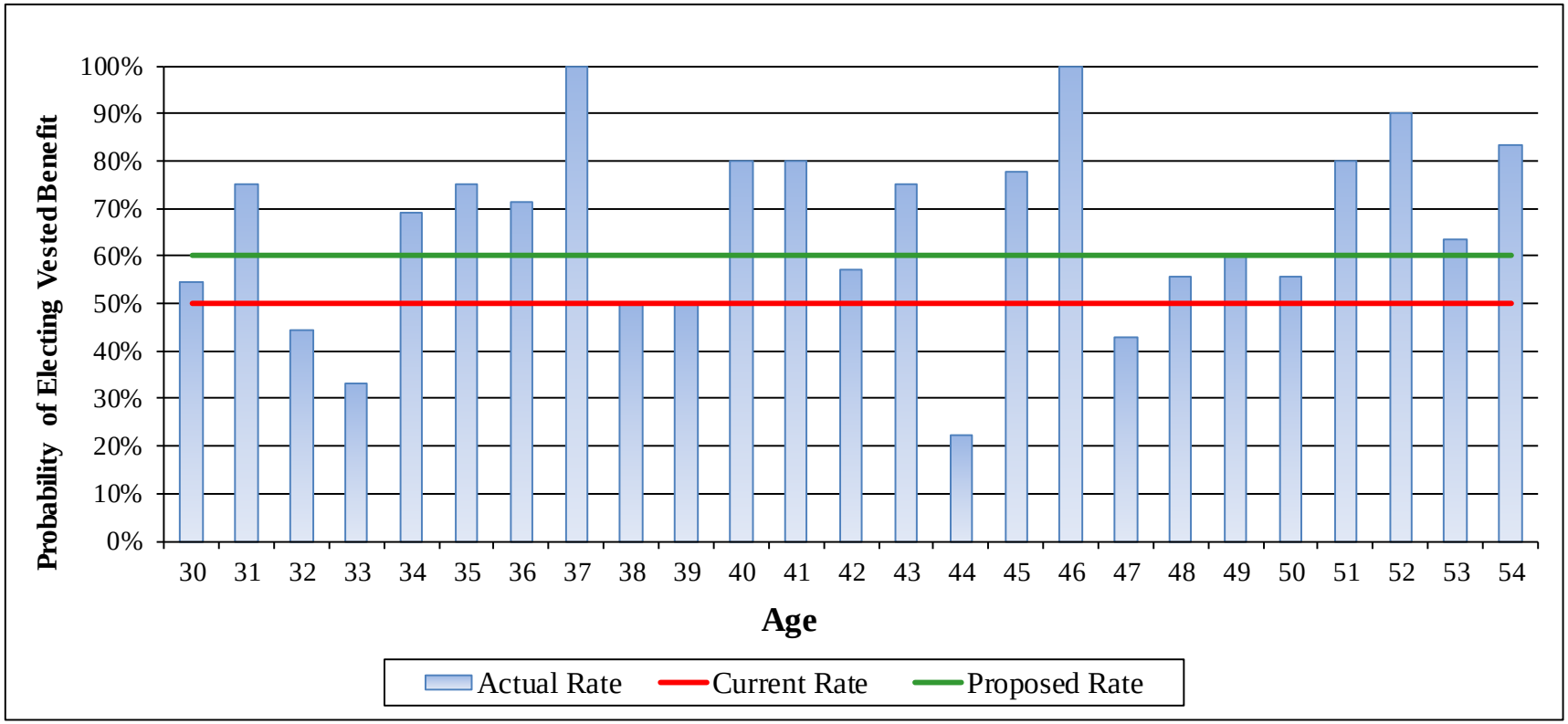
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-12

Probability of Contributions Remaining with the System

Classified



	Actual	Expected - Current Assumptions	Expected - Proposed Assumptions
Total Count	111	87	104
Actual/Expected		128%	107%

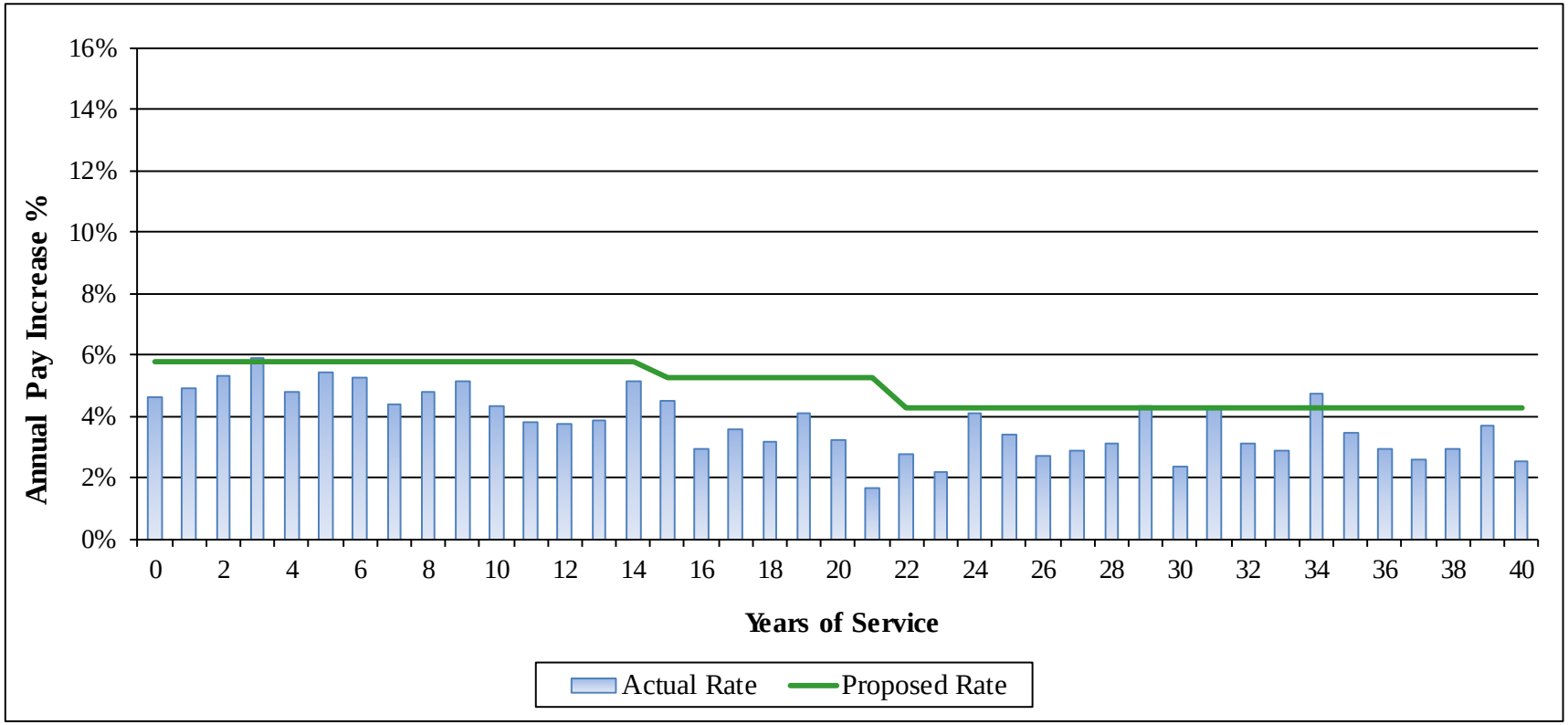
Omaha Schools

Experience Study 2012 - 2016

Exhibit C-13

Total Salary Scale

Certificated



	Actual	Expected - Proposed Assumptions
Average Increase	4.29%	5.45%
Actual/Expected		79%

Omaha Schools

Experience Study 2012 - 2016

Exhibit C-14

Total Salary Scale

Classified

	Actual	Expected - Proposed Assumptions
Average Increase	4.00%	4.43%
Actual/Expected		90%

Data Summary D-1
Probability of Death - Healthy Retirees
Males

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
60	277,546	-	0.000%	1,494	0.538%	2,381	0.858%
61	279,018	2,539	0.910%	1,733	0.621%	2,569	0.921%
62	369,356	6,850	1.855%	2,618	0.709%	3,660	0.991%
63	407,757	9,797	2.403%	3,351	0.822%	4,363	1.070%
64	456,271	3,260	0.714%	4,225	0.926%	5,284	1.158%
65	583,829	5,781	0.990%	6,104	1.046%	7,339	1.257%
66	598,242	5,817	0.972%	7,177	1.200%	8,177	1.367%
67	572,077	9,468	1.655%	7,657	1.338%	8,525	1.490%
68	591,089	1,349	0.228%	8,671	1.467%	9,631	1.629%
69	545,894	8,282	1.517%	8,873	1.625%	9,746	1.785%
70	565,748	27,928	4.937%	10,167	1.797%	11,084	1.959%
71	520,556	4,757	0.914%	10,351	1.988%	11,219	2.155%
72	456,075	13,610	2.984%	10,069	2.208%	10,828	2.374%
73	395,706	5,655	1.429%	9,731	2.459%	10,366	2.620%
74	354,854	6,934	1.954%	9,735	2.744%	10,271	2.894%
75	335,151	4,987	1.488%	10,409	3.106%	10,735	3.203%
76	320,402	14,305	4.465%	11,091	3.462%	11,372	3.549%
77	287,769	7,801	2.711%	11,239	3.905%	11,340	3.941%
78	272,282	11,403	4.188%	11,985	4.402%	11,923	4.379%
79	247,413	8,937	3.612%	12,276	4.962%	12,064	4.876%
80	204,794	1,291	0.630%	11,452	5.592%	11,131	5.435%
81	175,364	9,425	5.374%	11,131	6.348%	10,638	6.066%
82	149,912	24,591	16.404%	10,783	7.193%	10,161	6.778%
83	112,308	5,448	4.851%	9,004	8.018%	8,516	7.583%
84	108,186	6,610	6.110%	9,784	9.043%	9,178	8.484%
85	109,909	18,252	16.607%	11,033	10.038%	10,434	9.493%
	9,297,508	225,076	2.421%	222,144	2.389%	232,936	2.505%

Data Summary D-2
Probability of Death - Healthy Retirees
Females

Age	Exposure	Actual Deaths	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
60	631,528	2,652	0.420%	2,615	0.414%	3,233	0.512%
61	768,132	-	0.000%	3,620	0.471%	4,274	0.556%
62	935,998	10,775	1.151%	5,073	0.542%	5,675	0.606%
63	1,016,337	-	0.000%	6,307	0.621%	6,722	0.661%
64	1,172,600	3,782	0.322%	8,360	0.713%	8,466	0.722%
65	1,206,556	8,053	0.667%	9,695	0.803%	9,525	0.789%
66	1,237,729	14,573	1.177%	11,199	0.905%	10,689	0.864%
67	1,205,432	17,865	1.482%	12,309	1.021%	11,403	0.946%
68	1,075,690	9,052	0.841%	12,197	1.134%	11,164	1.038%
69	982,817	8,385	0.853%	12,318	1.253%	11,200	1.140%
70	867,197	14,951	1.724%	12,013	1.385%	10,863	1.253%
71	786,898	6,439	0.818%	12,281	1.561%	10,846	1.378%
72	719,638	16,580	2.304%	12,290	1.708%	10,926	1.518%
73	630,895	36,412	5.771%	11,984	1.900%	10,556	1.673%
74	540,010	7,197	1.333%	11,242	2.082%	9,966	1.846%
75	534,615	9,567	1.789%	12,335	2.307%	10,893	2.038%
76	524,627	11,758	2.241%	13,177	2.512%	11,810	2.251%
77	503,413	9,465	1.880%	13,931	2.767%	12,538	2.491%
78	452,438	6,213	1.373%	13,985	3.091%	12,485	2.760%
79	410,652	6,518	1.587%	13,992	3.407%	12,582	3.064%
80	343,330	16,961	4.940%	12,916	3.762%	11,703	3.409%
81	346,616	6,681	1.928%	14,413	4.158%	13,169	3.799%
82	306,231	12,284	4.012%	14,094	4.602%	13,002	4.246%
83	259,814	3,763	1.448%	13,256	5.102%	12,342	4.750%
84	229,948	21,360	9.289%	13,027	5.665%	12,251	5.328%
85	191,474	9,438	4.929%	12,064	6.301%	11,453	5.981%
	17,880,614	270,725	1.514%	290,694	1.626%	269,734	1.509%

Data Summary D-3
Retirement Rates
Certificated - Early
(Liability Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	266	30	11.369%	26.6	10.000%	26.6	10.000%
56	231	14	5.884%	11.5	5.000%	13.8	6.000%
57	193	14	7.401%	9.6	5.000%	11.6	6.000%
58	163	6	3.545%	8.1	5.000%	9.8	6.000%
59	159	13	8.286%	15.9	10.000%	12.7	8.000%
60	139	16	11.790%	13.9	10.000%	16.7	12.000%
61	59	2	3.978%	11.8	20.000%	7.1	12.000%
	1,209	96	7.920%	97.5	8.066%	98.2	8.127%

Data Summary D-4
Retirement Rates
Certificated - Select
(Liability Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	115	83	71.986%	57.4	50.000%	68.9	60.000%
56	45	23	50.764%	22.3	50.000%	22.3	50.000%
57	32	8	23.387%	16.1	50.000%	14.5	45.000%
58	34	15	44.183%	15.3	45.000%	15.3	45.000%
59	28	11	39.489%	12.8	45.000%	12.8	45.000%
60	24	8	35.374%	10.7	45.000%	8.3	35.000%
61	81	20	24.759%	36.6	45.000%	20.3	25.000%
62	73	17	23.006%	21.8	30.000%	18.2	25.000%
63	3	0	18.230%	1.6	60.000%	0.7	25.000%
64	10	3	28.132%	3.4	35.000%	2.9	30.000%
65	7	2	36.269%	2.4	35.000%	2.4	35.000%
	451	190	42.135%	200.5	44.421%	186.7	41.362%

Data Summary D-5
Retirement Rates
Certificated - Ultimate
(Liability Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	56	23	40.859%	16.9	30.000%	19.8	35.000%
57	78	16	21.151%	23.3	30.000%	27.2	35.000%
58	105	45	42.294%	31.6	30.000%	36.9	35.000%
59	90	21	23.277%	27.1	30.000%	22.6	25.000%
60	87	23	25.974%	17.4	20.000%	21.8	25.000%
61	108	15	13.488%	32.5	30.000%	27.1	25.000%
62	183	45	24.710%	54.9	30.000%	45.7	25.000%
63	220	37	16.884%	66.1	30.000%	55.1	25.000%
64	208	70	33.494%	72.7	35.000%	62.3	30.000%
65	133	48	36.310%	46.7	35.000%	46.7	35.000%
66	104	46	44.019%	25.9	25.000%	36.3	35.000%
67	62	26	41.984%	12.4	20.000%	21.7	35.000%
68	48	17	35.215%	9.6	20.000%	16.9	35.000%
69	30	3	11.278%	12.1	40.000%	10.6	35.000%
70	24	3	12.094%	24.2	100.000%	24.2	100.000%
	1,538	438	28.458%	473.5	30.788%	474.7	30.867%

Data Summary D-6
Retirement Rates
Classified - Early
(Liability Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	101	3	3.374%	3.0	3.000%	3.0	3.000%
56	92	3	3.393%	2.8	3.000%	2.8	3.000%
57	91	3	2.971%	2.7	3.000%	2.7	3.000%
58	87	3	3.465%	2.6	3.000%	2.6	3.000%
59	88	2	2.711%	2.6	3.000%	2.6	3.000%
60	79	4	5.212%	2.4	3.000%	3.9	5.000%
61	41	2	4.397%	8.2	20.000%	4.1	10.000%
	579	21	3.549%	24.3	4.203%	21.8	3.768%

Data Summary D-7
Retirement Rates
Classified - Select
(Liability Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
55	12	2	19.655%	2.4	20.000%	2.4	20.000%
56	3	-	0.000%	0.3	10.000%	0.3	10.000%
57	5	3	55.650%	0.5	10.000%	0.5	10.000%
58	12	1	10.676%	1.2	10.000%	1.2	10.000%
59	6	1	18.290%	0.9	15.000%	0.9	15.000%
60	11	1	8.739%	3.9	35.000%	1.7	15.000%
61	46	5	10.715%	9.2	20.000%	6.9	15.000%
62	44	7	15.409%	8.8	20.000%	8.8	20.000%
63	3	0	5.123%	1.7	50.000%	0.7	20.000%
64	8	3	33.689%	2.3	30.000%	1.5	20.000%
65	4	1	13.121%	1.3	30.000%	1.1	25.000%
	154	23	15.215%	32.5	21.076%	25.9	16.819%

Data Summary D-8
Retirement Rates
Classified - Ultimate
(Liability Weighted)

Age	Exposure	Actual Retirements	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
56	14	2	12.344%	2.1	15.000%	1.7	12.000%
57	14	2	11.915%	2.1	15.000%	1.7	12.000%
58	29	3	9.261%	4.4	15.000%	3.5	12.000%
59	41	7	17.785%	6.2	15.000%	4.9	12.000%
60	45	3	6.956%	6.8	15.000%	5.4	12.000%
61	53	9	17.409%	10.7	20.000%	10.7	20.000%
62	84	20	23.774%	25.3	30.000%	16.8	20.000%
63	104	16	15.215%	20.8	20.000%	20.8	20.000%
64	99	21	21.416%	19.9	20.000%	19.9	20.000%
65	84	33	39.231%	29.3	35.000%	29.3	35.000%
66	60	21	35.160%	18.1	30.000%	13.9	23.000%
67	32	7	22.250%	6.4	20.000%	7.3	23.000%
68	25	6	22.815%	5.0	20.000%	5.8	23.000%
69	21	6	29.792%	4.3	20.000%	4.9	23.000%
70	14	5	36.388%	14.1	100.000%	14.1	100.000%
	721	161	22.375%	175.3	24.318%	160.7	22.293%

Data Summary D-9
Rate of Termination of Employment
Certificated
(Liability Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Proposed Expected	Proposed Rate
1	525	59	11.291%	59	11.250%
2	872	93	10.608%	92	10.500%
3	1,158	99	8.548%	113	9.750%
4	1,548	147	9.486%	139	9.000%
5	2,134	171	8.025%	171	8.000%
6	2,763	180	6.507%	193	7.000%
7	3,394	231	6.804%	212	6.250%
8	3,717	170	4.577%	204	5.500%
9	3,790	158	4.158%	189	5.000%
10	3,946	144	3.659%	178	4.500%
11	3,929	135	3.439%	157	4.000%
12	4,266	126	2.942%	160	3.750%
13	4,726	185	3.914%	154	3.250%
14	4,909	123	2.505%	135	2.750%
15	4,999	109	2.185%	112	2.250%
16	4,758	53	1.114%	95	2.000%
17	3,829	51	1.343%	67	1.750%
18	3,514	21	0.592%	53	1.500%
19	3,580	11	0.303%	45	1.250%
20	3,354	32	0.940%	34	1.000%
21	3,427	-	0.000%	34	1.000%
22	3,538	43	1.203%	35	1.000%
23	3,704	-	0.000%	37	1.000%
24	3,637	29	0.785%	36	1.000%
25	3,764	15	0.386%	38	1.000%
	83,782	2,383	2.844%	2,743	3.274%

Data Summary D-10
Rate of Termination of Employment
Classified - Males
(Liability Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Proposed Expected	Proposed Rate
1	79	9	11.279%	9	11.000%
2	123	7	6.070%	11	9.250%
3	167	15	8.764%	14	8.250%
4	183	10	5.219%	13	7.000%
5	211	12	5.837%	13	6.000%
6	271	19	6.897%	14	5.000%
7	340	11	3.216%	13	3.800%
8	407	9	2.246%	13	3.200%
9	427	8	1.768%	11	2.600%
10	422	12	2.784%	10	2.400%
11	352	5	1.546%	7	1.900%
12	370	2	0.481%	6	1.650%
13	438	19	4.372%	6	1.400%
14	480	-	0.000%	6	1.250%
15	529	4	0.741%	5	1.000%
16	478	-	0.000%	5	1.000%
17	473	-	0.000%	5	1.000%
18	400	-	0.000%	4	1.000%
19	348	-	0.000%	3	1.000%
20	338	9	2.789%	3	1.000%
21	373	-	0.000%	4	1.000%
22	327	-	0.000%	3	1.000%
23	359	10	2.648%	4	1.000%
24	283	-	0.000%	3	1.000%
25	204	-	0.000%	2	1.000%
	8,383	160	1.912%	186	2.221%

Data Summary D-11
Rate of Termination of Employment
Classified - Females
(Liability Weighted)

Duration	Exposure	Actual Terminations	Actual Rate	Proposed Expected	Proposed Rate
1	113	16	14.260%	17	15.000%
2	190	26	13.969%	25	13.000%
3	255	27	10.652%	29	11.500%
4	375	40	10.603%	38	10.250%
5	492	45	9.055%	44	9.000%
6	580	64	11.103%	46	8.000%
7	631	47	7.405%	44	7.000%
8	611	26	4.283%	37	6.000%
9	534	15	2.827%	27	5.000%
10	572	24	4.242%	23	4.000%
11	576	19	3.334%	19	3.250%
12	661	12	1.862%	18	2.750%
13	702	21	2.964%	16	2.250%
14	668	13	1.884%	13	2.000%
15	718	3	0.422%	13	1.750%
16	622	13	2.011%	9	1.500%
17	596	6	0.992%	7	1.250%
18	602	-	0.000%	6	1.000%
19	567	-	0.000%	6	1.000%
20	474	-	0.000%	5	1.000%
21	443	-	0.000%	4	1.000%
22	478	-	0.000%	5	1.000%
23	479	4	0.932%	5	1.000%
24	459	-	0.000%	5	1.000%
25	285	-	0.000%	3	1.000%
	12,686	422	3.325%	464	3.657%

Data Summary D-12
Probability of Contributions Remaining with the System
Classified

Age	Terminations	Actual Remaining	Actual Rate	Current Expected	Current Rate	Proposed Expected	Proposed Rate
30	11	6	54.5%	5.5	50.0%	6.6	60.0%
31	4	3	75.0%	2.0	50.0%	2.4	60.0%
32	9	4	44.4%	4.5	50.0%	5.4	60.0%
33	6	2	33.3%	3.0	50.0%	3.6	60.0%
34	13	9	69.2%	6.5	50.0%	7.8	60.0%
35	4	3	75.0%	2.0	50.0%	2.4	60.0%
36	7	5	71.4%	3.5	50.0%	4.2	60.0%
37	2	2	100.0%	1.0	50.0%	1.2	60.0%
38	2	1	50.0%	1.0	50.0%	1.2	60.0%
39	4	2	50.0%	2.0	50.0%	2.4	60.0%
40	5	4	80.0%	2.5	50.0%	3.0	60.0%
41	5	4	80.0%	2.5	50.0%	3.0	60.0%
42	7	4	57.1%	3.5	50.0%	4.2	60.0%
43	4	3	75.0%	2.0	50.0%	2.4	60.0%
44	9	2	22.2%	4.5	50.0%	5.4	60.0%
45	9	7	77.8%	4.5	50.0%	5.4	60.0%
46	6	6	100.0%	3.0	50.0%	3.6	60.0%
47	7	3	42.9%	3.5	50.0%	4.2	60.0%
48	9	5	55.6%	4.5	50.0%	5.4	60.0%
49	10	6	60.0%	5.0	50.0%	6.0	60.0%
50	9	5	55.6%	4.5	50.0%	5.4	60.0%
51	5	4	80.0%	2.5	50.0%	3.0	60.0%
52	10	9	90.0%	5.0	50.0%	6.0	60.0%
53	11	7	63.6%	5.5	50.0%	6.6	60.0%
54	6	5	83.3%	3.0	50.0%	3.6	60.0%
	174	111	63.8%	87.0	50.0%	104.4	60.0%

Data Summary D-13
Total Salary Scale
Certificated

Duration	Initial Salary (Millions)	Subsequent Salary (Millions)	Actual Rate	Proposed Expected (Millions)	Proposed Rate
1	46.5	48.8	4.89%	49.2	5.75%
2	38.9	41.0	5.33%	41.2	5.75%
3	35.3	37.4	5.91%	37.3	5.75%
4	34.9	36.6	4.78%	36.9	5.75%
5	39.1	41.2	5.45%	41.3	5.75%
6	42.9	45.1	5.26%	45.4	5.75%
7	45.2	47.2	4.36%	47.8	5.75%
8	43.7	45.8	4.77%	46.2	5.75%
9	41.3	43.5	5.15%	43.7	5.75%
10	38.5	40.1	4.33%	40.7	5.75%
11	35.9	37.3	3.79%	38.0	5.75%
12	36.0	37.4	3.75%	38.1	5.75%
13	36.8	38.3	3.87%	38.9	5.75%
14	35.4	37.2	5.14%	37.4	5.75%
15	33.4	34.9	4.50%	35.1	5.25%
16	30.0	30.9	2.94%	31.6	5.25%
17	22.6	23.4	3.55%	23.7	5.25%
18	19.4	20.0	3.15%	20.5	5.25%
19	19.3	20.1	4.08%	20.3	5.25%
20	16.9	17.4	3.20%	17.8	5.25%
21	16.6	16.9	1.65%	17.5	5.25%
22	16.9	17.4	2.75%	17.7	4.25%
23	16.6	16.9	2.19%	17.3	4.25%
24	15.3	15.9	4.10%	15.9	4.25%
25	14.7	15.2	3.37%	15.3	4.25%
26	11.8	12.1	2.67%	12.3	4.25%
27	10.8	11.1	2.89%	11.2	4.25%
28	7.9	8.2	3.08%	8.3	4.25%
29	6.4	6.7	4.34%	6.7	4.25%
30	4.6	4.7	2.32%	4.8	4.25%
31	3.3	3.4	4.23%	3.4	4.25%
32	2.7	2.8	3.09%	2.8	4.25%
33	2.4	2.4	2.86%	2.5	4.25%
34	1.9	1.9	4.72%	1.9	4.25%
35	1.0	1.0	3.47%	1.0	4.25%
36	1.0	1.1	2.92%	1.1	4.25%
37	0.9	1.0	2.57%	1.0	4.25%
38	1.0	1.0	2.93%	1.1	4.25%
39	1.1	1.1	3.67%	1.1	4.25%
40	1.2	1.2	2.52%	1.2	4.25%
	830.1	865.5	4.27%	875.2	5.44%

Data Summary D-14
Total Salary Scale
Classified

Duration	Initial Salary (Millions)	Subsequent Salary (Millions)	Actual Rate	Proposed Expected (Millions)	Proposed Rate
1	11.9	12.4	3.99%	12.6	5.75%
2	9.6	10.1	4.61%	10.1	5.25%
3	9.5	9.9	4.37%	10.0	5.00%
4	10.2	10.7	4.56%	10.7	4.75%
5	10.5	10.9	4.10%	11.0	4.75%
6	10.0	10.5	4.83%	10.5	4.75%
7	10.0	10.4	4.00%	10.4	4.25%
8	9.1	9.5	3.56%	9.5	4.25%
9	8.2	8.6	4.91%	8.5	4.25%
10	6.9	7.1	3.42%	7.2	4.25%
11	6.4	6.6	3.89%	6.6	4.25%
12	7.6	7.8	2.48%	7.9	3.75%
13	6.9	7.2	3.75%	7.2	3.75%
14	7.0	7.4	4.81%	7.3	3.75%
15	5.7	5.9	3.01%	5.9	3.75%
16	5.7	5.9	2.76%	5.9	3.75%
17	4.8	4.9	2.30%	5.0	3.75%
18	4.5	4.6	2.73%	4.6	3.75%
19	3.6	3.8	4.53%	3.8	3.75%
20	3.3	3.4	2.19%	3.4	3.75%
21	3.4	3.5	2.52%	3.5	3.75%
22	3.2	3.3	3.00%	3.3	3.75%
23	3.0	3.1	2.17%	3.1	3.75%
24	1.6	1.7	5.20%	1.7	3.75%
25	1.6	1.6	2.30%	1.6	3.75%
26	1.7	1.7	2.09%	1.7	3.75%
27	1.7	1.7	2.06%	1.7	3.75%
28	1.4	1.4	1.90%	1.4	3.75%
29	0.7	0.7	3.77%	0.7	3.75%
30	0.6	0.6	2.04%	0.6	3.75%
31	0.7	0.8	1.99%	0.8	3.75%
32	0.6	0.6	1.89%	0.6	3.75%
33	0.7	0.7	2.40%	0.7	3.75%
34	0.5	0.5	3.35%	0.5	3.75%
35	0.4	0.4	3.14%	0.4	3.75%
36	0.4	0.4	2.57%	0.4	3.75%
37	0.4	0.4	3.03%	0.4	3.75%
38	0.6	0.6	2.91%	0.6	3.75%
39	0.5	0.5	2.64%	0.5	3.75%
40	0.3	0.3	1.75%	0.3	3.75%
	175.5	182.0	3.73%	183.0	4.33%