

**NEW MEXICO EDUCATIONAL RETIREMENT BOARD**  
ACTUARIAL EXPERIENCE STUDY  
AS OF JUNE 30, 2012

April 26, 2013

Board of Trustees  
Educational Retirement Board of New Mexico  
701 Camino de los Marquez  
Santa Fe, NM 87501

**Subject: Results of 2012 Experience Study**

Dear Members of the Board:

We are pleased to present our report on the results of the 2012 Experience Study for the New Mexico Educational Retirement Board (ERB). We have reviewed each of the actuarial assumptions and compared them to actual experience over the six year period ending June 30, 2012.

This report summarizes our findings and recommendations for changes to some of the actuarial assumptions used for the ERB actuarial valuation. In addition, the report provides the estimated effect on the actuarial liabilities and contribution rates if our recommendations are adopted.

We wish to thank the ERB staff for their assistance in providing data for this study.

Respectfully submitted,  
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## **SECTION I**

### EXECUTIVE SUMMARY

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## Executive Summary

- **Purpose**
  - To review actuarial assumptions and methods and to compare to actual recent experience
  - Used data from six-year period ending June 30, 2012
- **Inflation rate**
  - Current assumption is 3.00%
  - Five-year average increase in CPI-U is 1.95%, ten-year average is 2.46%, thirty-year average is 2.91%
  - Component of investment return assumption, COLA assumption, salary increase assumption, and assumed payroll growth rate
  - NEPC 2012 capital market assumption set included an inflation of 2.50%
  - Recommend no change in assumed inflation rate
- **Investment return rate**
  - Current assumption is 7.75%
  - Reduced assumption from 8.00% as part of the 2010 experience study
  - Assumed rate is net of administrative and investment expenses
  - Assume these expenses consume 45 basis points of return, based on recent experience
  - 7.75% assumed rate is composed of a 3.00% inflation assumption and an assumed 4.75% net real return (gross real return reduced by assumed expenses)
  - Actual net market return of 6.4% for last 10 years and 7.5% for last 18 years
  - 8% still most common rate for large public retirement systems, but trending down
  - Recommend no change to this assumption
- **Cost-of-living increases**
  - Current assumption of 2.00%
  - COLAs are deferred to age 65 (or age 67 for new hires), except for disabled retirees and a small grandfathered group
  - Based on inflation assumption (3.00%) and current provisions (one-half CPI, maximum 4%, but not less than the smaller of a 2% increase or 100% CPI increase, with additional decreases for some members if the plan funded ratio is less than 100%)
  - Valuation will realize small gains every year that the full COLA is not paid
  - Recommend no change to this assumption

- ***Salary increase rate***
  - Salary increases are comprised of price inflation, overall “productivity” increases, and longevity/promotional component
  - We assume 3.00% inflation, plus 1.75% across-the-board productivity increases, plus additional service-related increases during first 10 years of service
  - Average increase for last ten years of 5.14%
  - Analysis shows the actual productivity component of wage inflation over the last five years has averaged about 0.69%
  - Analysis shows the current assumption for additional merit increases for short-service employees continues to fit well to the data
  - Current assumptions are conservative
  - We recommend a decrease to the productivity component of wage inflation from 1.75% to 1.25%, but no change to the additional merit increase assumptions for members with less than 10 years of service
  
- ***Payroll growth rate***
  - Rate at which total ERB payroll is expected to grow
  - Current assumed payroll growth rate is 3.75%
  - Only affects GASB disclosures, not liability
  - Will be lower than expected salary increases for the average member because members who terminate, retire, etc. are usually replaced with lower-paid members
  - Assumes no membership growth, per GASB 25
  - In last six years, payroll grew on average 2.0% per year, or 2.2% if adjusted for membership growth
  - Payroll is assumed to increase more slowly than the proposed 4.25% wage inflation assumption, due to the impact of baby boomers retiring in large numbers over the next 10-15 years
  - Recommend decrease payroll growth assumption to 3.50%

- ***Post-retirement mortality rates (nondisabled retirees):***
  - Current tables: 90% of RP 2000 Combined Mortality Table with White Collar Adjustment, set back one year, projected to 2010
  - 1,826 male deaths and 2,291 female deaths during six-year period (excludes beneficiaries and disabled)
  - Expected 1,525 male deaths and 2,174 female deaths
  - A/E ratio (actual to expected deaths) is 120% for males and 105% for females
  - A/E ratios in study two years ago were 114% for males and 109% for females after reflecting the new assumption at that time
  - We recommend modifying this assumption by projecting mortality improvements for an additional four years to 2014 for both males and females and by removing the setback on the male table
  - The tables are still conservative, with A/E ratios of 111% for males and 107% for females reflecting proposed assumption change
  
- ***Disabled mortality rates:***
  - 88 male and 100 female actual deaths; expected 79 male and 120 female deaths
  - 112% A/E ratio for males, 83% for females, and 95% overall
  - A/E ratios in study two years ago were 108% for males, 92% for females, and 98% overall
  - We recommend no change to the assumption for males but we recommend scaling the female mortality rates back to 90% of the current assumption
  
- ***Active mortality rates:***
  - 224 male and 223 female actual deaths; expected 210 male and 270 female deaths
  - 107% A/E ratio for males, 82% for females, overall ratio is 93%
  - We recommend no change to assumption for males but we recommend applying a two-year setback to the assumption for females
  
- ***Disability:***
  - A/E for disability was 89% for males, 66% for females, and 73% combined
  - A/E ratios in study two years ago were 99% for males, 81% for females, and 87% combined
  - A/E ratios in study four years ago were 111% for males, 89% for females, and 96% combined
  - Small number of disabilities, so A/E results can be volatile
  - We recommend no change to this assumption, but a change may be necessary in the future if recent trends continue

- **Retirement rates:**
  - 3,029 male retirements during six-year period and 6,793 female retirements (from active employment)
  - These numbers exclude retirements of previously terminated members
  - Average retirement age of 59.8 for males and 59.5 for females
  - To be conservative, generally look for A/E ratios between 85% and 100%
  - Current tables produce overall A/E ratios of 99% for males and 92% for females
  - The A/Es at 25+ years of service are 103% for males and 91% for females
  - The A/Es for members who became eligible for the Rule of 75 are 103% for males and 95% for females
  - The A/Es for members who became eligible at age 65 are 82% for males and 89% for females
  - Overall A/Es have a reasonable level of conservatism. However, we recommend slight adjustments to the assumed rates of retirement, primarily between the ages of 61 to 65, the better reflect the patterns of retirement.
  
- **Termination rates:**
  - A/E ratios at 101% for males and 102% for females
  - Ratios over 100% for this assumption are conservative
  - Both ratios decreased slightly from last experience study
  - We recommend a structural change from an age-and-service based table to a more simplified service-only based table
  - Not a significant change in the expected pattern of terminations and virtually no change to the overall A/E
  
- **Refunds:**
  - Current assumption is that vested members choose the more valuable of a refund or a deferred benefit
  - Conservative and reasonable; Assumes members choose benefit of greatest economic value.
  - We recommend no change to this assumption
  
- **Other assumptions:**
  - Percent married, age difference of spouse, etc.
  - These assumptions are reasonable or conservative
  - We recommend no change to these assumptions



- ***Actuarial methods:***
  - Individual Entry Age Normal actuarial cost method still appropriate
  - Most widely used method among public, statewide plans
  - We recommend no change for the actuarial cost method
  - Actuarial asset method (five-year smoothing) still appropriate; no change recommended
  - We recommend the membership growth assumption used for projections be decreased from 0.75% to 0.50%
  
- ***Summary of recommendations and estimated impact:***
  - Changes to post-retirement mortality
  - Changes to disabled mortality
  - Changes to active mortality
  - Changes to retirement rates
  - Change to service-based termination table
  - Decrease wage inflation from 4.75% to 4.25%
  - Decrease payroll growth from 3.75% to 3.50%
  - Change the population growth assumption to 0.50% per year (no impact on valuation results)
  - UAAL decreases by \$76 million, the funded ratio increases from 60.7% to 61.0%, and the normal cost rate decreases from 13.79% to 13.10% when compared to the results of the June 30, 2012 actuarial valuation

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**SECTION II**  
INTRODUCTION

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## Introduction

In determining liabilities, contribution rates and funding periods for retirement plans, actuaries must make assumptions about the future. Among the assumptions that must be made are:

- Retirement rates
- Mortality rates
- Turnover rates
- Disability rates
- Investment return rate
- Salary increase rates
- Inflation rate

For some of these assumptions, such as the mortality rates, past experience provides important evidence about the future. For other assumptions, such as the investment return rate, the link between past and future results is much weaker. In either case, though, actuaries should review their assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

In conducting experience studies, actuaries generally use data over a period of several years. This is necessary in order to gather enough data so that the results are statistically significant. In addition, if the study period is too short, the impact of the current economic conditions may lead to misleading results. It is known, for example, that the health of the general economy can impact salary increase rates and withdrawal rates. Using results gathered during a short-term boom or bust will not be representative of the long-term trends in these assumptions. Also, the adoption of legislation, such as plan improvements or changes in salary schedules, will sometimes cause a short-term distortion in the experience. For example, if an early retirement window was opened during the study period, we would usually see a short-term spike in the number of retirements followed by a dearth of retirements for the following two-to-four years. Using a longer period prevents giving too much weight to such short-term effects. On the other hand, using a much longer period would water down real changes that may be occurring, such as mortality improvement or a change in the ages at which members retire. In our view, using a six-year period is reasonable.

In an experience study, we first determine the number of deaths, retirements, etc. that occurred during the period. Then we determine the number expected to occur, based on the current actuarial assumptions. The number “expected” is determined from using the probability of the occurrence at the given age, times the “exposures” at that same age. For example, let’s look at a rate of retirement of 50% at age 55. The number of exposures can only be those members who are age 55 and eligible for retirement at that time. Thus they are considered “exposed” to that assumption. Finally we calculate the A/E ratio, where "A" is the actual number (of retirements, for example) and "E" is the expected number. If the current assumptions were "perfect", the A/E ratio would be

100%. When it varies much from this figure, it is a sign that new assumptions may be needed. Of course we not only look at the assumptions as a whole, but we also review how well they fit the actual results by sex, by age, and by service.

Finally, the actuary "graduates" or smoothes the results since the raw results can be quite uneven from age to age or from service year to service year.

## **ORGANIZATION OF REPORT**

Section III contains our findings and recommendations for each actuarial assumption. The impact of adopting our recommendations on liabilities and contribution rates is shown in Section IV. Section V summarizes the recommended changes. Section VI presents a summary of all the actuarial assumptions and methods, including the recommended changes.

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## **SECTION III**

### ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

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## Analysis of Experience and Recommendations

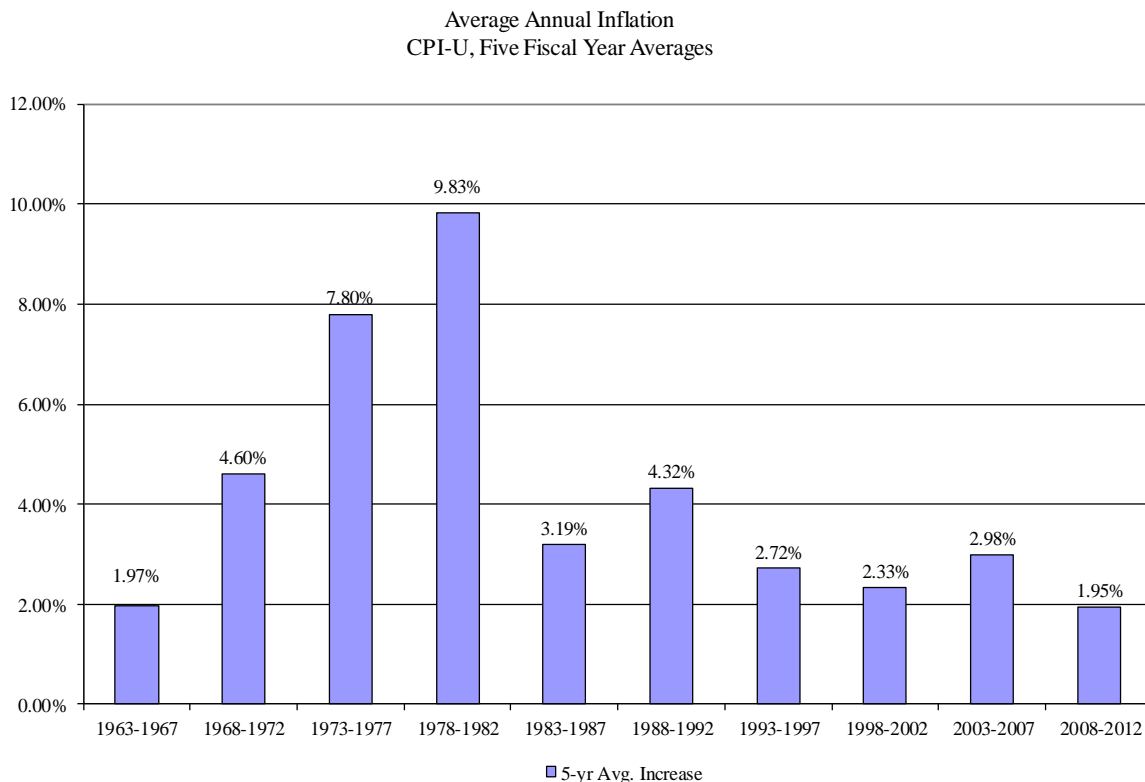
We will begin by discussing the economic assumptions: inflation, the investment return rate, the salary increase assumption, the cost-of-living increases, and the payroll growth rate. Then we will discuss the demographic assumptions: mortality, disability, termination and retirement. Finally we will discuss the actuarial methods used.

### INFLATION RATE

By “inflation,” we mean price inflation, as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies all of the other economic assumptions employed including investment return, individual salary increases, payroll growth and retiree benefit increases. The current annual inflation assumption is 3.00%. It was last changed effective with the June 30, 2001 valuation from 3.50% to 3.00%.

Over the six-year period from June 2006 through June 2012, the CPI-U has increased at an average rate of 2.07% per year. However, the assumed inflation rate is only weakly tied to past results, and this has been a period of fluctuating inflation.

The chart below shows the average annual inflation in each of the ten consecutive five-year periods over the last fifty years:



The table below shows the average inflation over various periods, ending June 2012:

Periods Ending June 2012	Average Annual Increase in CPI-U
Last five (5) years	1.95%
Last ten (10) years	2.46%
Last fifteen (15) years	2.42%
Last twenty (20) years	2.49%
Last thirty (30) years	2.91%
Since 1913 (first available year)	3.24%

Source: Bureau of Labor Statistics, CPI-U, all items, not seasonally adjusted

Inflation has been relatively low over the last 20 years, yet over a period of more than 30 years inflation has averaged 3.00% per year or higher.

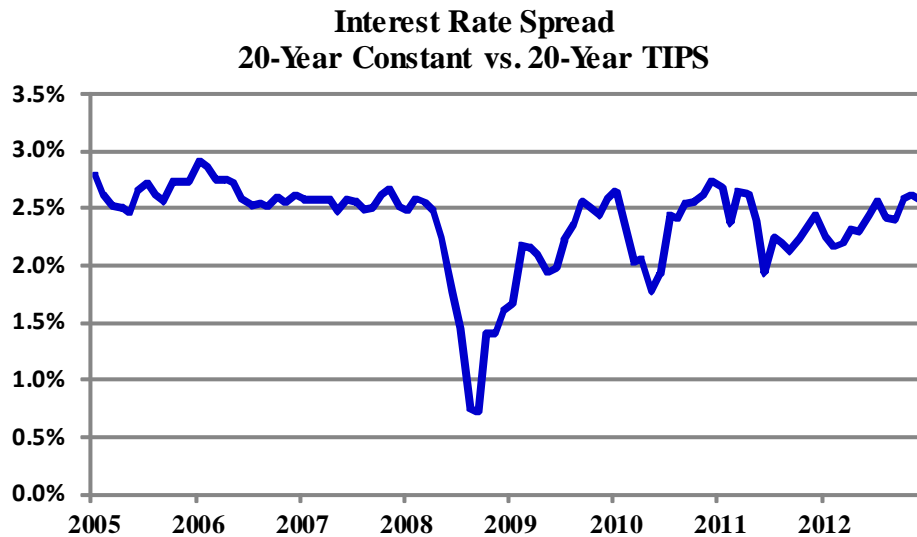
Many of the investment consulting firms, in setting their capital market assumptions, currently assume that inflation will be less than 3.00%. We examined the 2012 capital market assumption sets for several investment consulting firms, including: NEPC (ERB's consultant), JP Morgan, Towers Watson, Mercer, and Hewitt Ennis Knupp. The average assumption for inflation was 2.60%, with a range of 2.16% through 3.26%. However, the investment consulting firms typically set their assumptions based on a five or ten year outlook, while actuaries must make much longer projections.

### **Bond Market**

Another source of information about future inflation is the market for US Treasury bonds. Comparing the yields for conventional Treasury securities and Treasury Inflation-Protected Securities (TIPS) provides a useful measure of the market's expectation of future inflation. Conventional Treasury securities compensate its holders by providing a nominal yield with two components, the real rate of interest plus inflation compensation. Since TIPS already adjust for inflation, the yield only includes the real rate of interest. Therefore the difference roughly reflects the inflation expectation for that maturity horizon.

For example, the April 1, 2013 yield for a 20-year inflation indexed Treasury bond was 0.14% plus actual inflation. The yield for a 20-year non-indexed US Treasury bond was 2.70%. This means that on that day the bond market was predicting that inflation over the next twenty years would average 2.56% (2.70% minus 0.14%) per year.

However, this analysis can fluctuate quite a bit over a short period of time. On the next page is a chart with the historical spread between 20-year constant and 20-year inflation protected Treasury bonds.



The historical spread between the constant and inflation protected securities was relatively constant from 2005 up to the beginning of the crisis in the credit market. The decrease in the spread during the collapse of the US investment markets and the subsequent volatility reflect differences in liquidity and the risk premiums that buyers of US Treasury securities require.

### Other Sources of Inflation Forecasts

In the Social Security Administration's 2012 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.8% under the intermediate cost assumption. (The inflation assumption is 1.8% and 3.8% respectively in the low cost and high cost projection scenarios.) These inflation assumptions have remained unchanged for several years.

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their most recent forecast (fourth quarter of 2012) was for inflation over the next ten years to average 2.30%.

Another source of information is the Public Funds Survey that is prepared on behalf of the National Association of State Retirement Administrators (NASRA) and the National Council on Teacher Retirement (NCTR). This report surveys about 127 plans, including all of the largest public funds covering state employees or teachers. The current survey shows that the median inflation rate assumed for large public retirement systems in the U.S. is 3.50%, with the most prevalent assumption at 3.00%. Approximately 40% of the surveyed systems use an assumption of 3.00% or less. The information in the Public Funds Survey for many of the systems is more than a year old and it is possible that some systems have subsequently updated their assumptions. In fact, several statewide public retirement systems have lowered this assumption in 2011 and 2012.



**Recommendation**

We believe that inflation over the next few years may continue to be less than 3.00% annually, but believe it would be more prudent to assume a 3.00% rate of inflation over the long term. This is in line with the average for the last 30 years, and a little below the long-term historical average. Therefore, we are recommending retaining the annual 3.00% inflation assumption. This is 0.50% higher than NEPC's inflation assumption in their 2012 capital market assumption set, but their assumption is based on an approximate 10 year horizon while ours is longer. In our analysis, we have used a 3.00% inflation assumption as the building block for the other economic assumptions.

**INVESTMENT AND ADMINISTRATIVE EXPENSES**

Since the trust fund pays expenses in addition to member benefits and refunds, the valuation must make some assumption about these expenses. Almost all actuaries treat investment expenses as an offset to the investment return assumption. That is, the investment return assumption represents expected return after payment of investment expenses.

On the other hand, there is a divergence of practice on the handling of administrative expenses. Some actuaries make an assumption that administrative expenses will be some fixed or increasing dollar amount. Others assume that the administrative expenses will be some percentage of the plan's actuarial liabilities or normal cost. And others treat administrative expenses like investment expenses, as an offset to the investment return assumption. The ERB practice is to set the investment return assumption as the net return after payment of both investment and administrative expenses.

This chart shows the administrative and investment expenses for the last six years expressed as a percentage of the assets, adjusted for cash flow, each year:

Annual Expenses Expressed as a Percentage Assets			
Fiscal Year	Administrative	Investment	Total
2012	0.13%	0.12%	0.24%
2011	0.14%	0.43%	0.57%
2010	0.16%	0.45%	0.61%
2009	0.10%	0.19%	0.29%
2008	0.06%	0.22%	0.28%
2007	0.07%	0.26%	0.32%
Average	0.11%	0.28%	0.39%

The expense assumption was changed two years ago from 0.30% to 0.45% partially because the plan was in the process of shifting their asset allocation into some alternative asset classes that traditional incur higher expenses. However, the average for the last six years continues to remain less than the current assumption. Based on this information, we recommend the Board retain the current assumption that investment and administrative expenses will consume 0.45% (45 basis points) of each year's investment return. This assumption is then used as a component in setting the investment return assumption.

## **INVESTMENT RETURN RATE**

The investment return assumption is one of the principal assumptions in any actuarial valuation of a retirement plan. It is used to discount future expected benefit payments to the valuation date, in order to determine the liabilities of the plans. Even a small change to this assumption can produce significant changes to the liabilities and actuarially determined contribution rates.

### **ASOP 27**

Actuaries are required to comply with Actuarial Standard of Practice No. 27 (ASOP 27) in setting economic assumptions for retirement plans, including the assumed investment return rate. It is the actuary's duty to provide the information needed to make those decisions, and to make recommendations to the Board. Although the Board is the ultimate decision-making body, actuaries are still bound by ASOP 27 in providing advice or recommendations.

The standard requires the actuary to identify the components of each assumption, to evaluate relevant data, and to set a best-estimate range. Then the actuary selects a point within this best-estimate range. Alternatively, the actuary may simply set the assumption without specifying a best-estimate range. Additionally, the ASOP requires that all economic assumptions be consistent with one another.

The best-estimate range is "the narrowest range within which the actuary reasonably anticipates that the actual results, compounded over the measurement period, are more likely than not to fall." If the best-estimate range for the investment return assumption is from m% to n%, we must believe that just over half the time the actual compound rate of return in the future will be within this range.

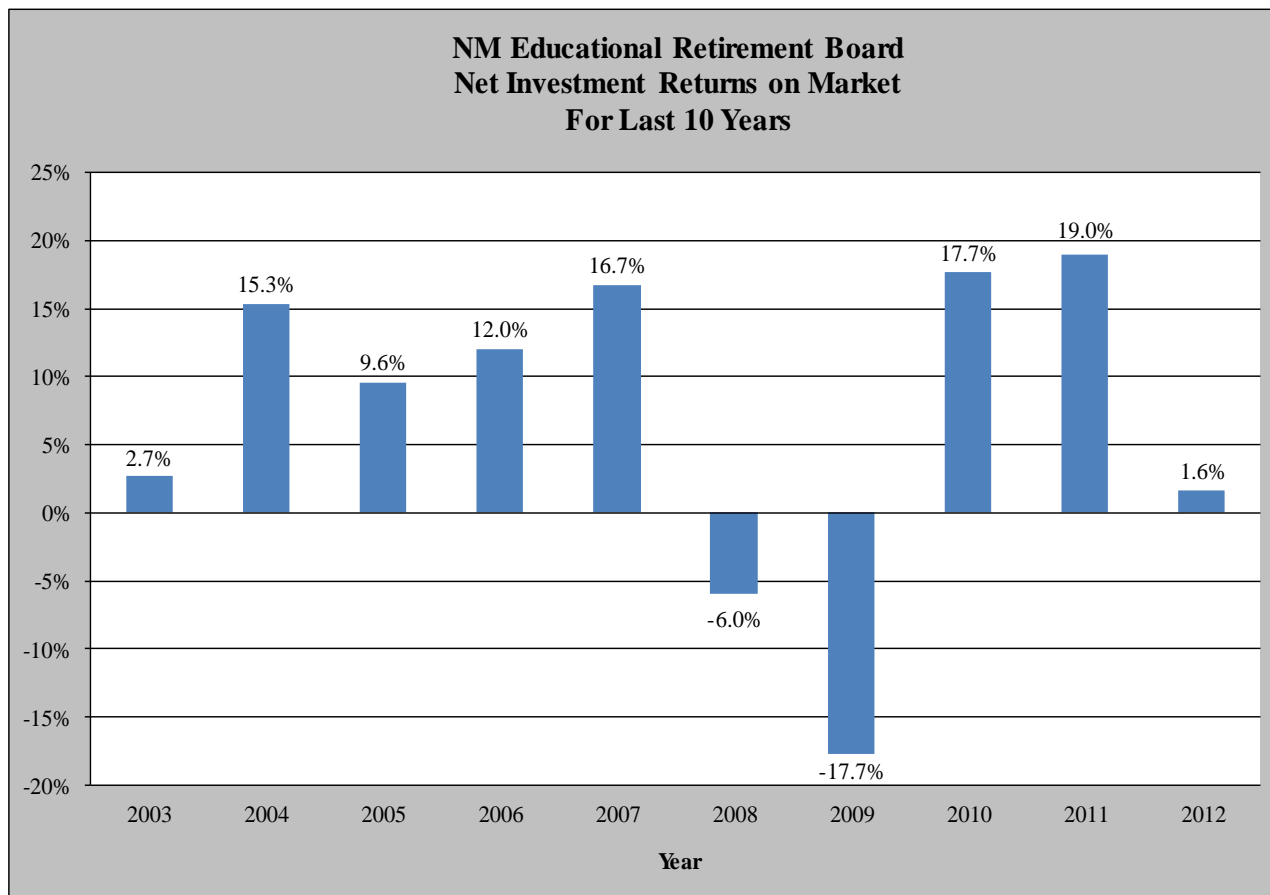
For several reasons, the actuarial profession has decided that ASOP 27 should be updated, and a new exposure draft has been published. One criticism of the current standard is that the range of potential investment return assumptions that could be considered reasonable under the current standard is too wide. The "best estimate range" described above has been eliminated from the new draft standard. The new standard may require the actuary to set an assumption, generally a single point estimate that is contained within the range between the geometric return median and the arithmetic return based on capital market assumptions for the real returns and the base inflation assumption.

While the new standard is not effective yet, and it could still be changed, we believe it would be prudent to consider it, particularly because the new standard will likely be in effect for either the

June 30, 2013 or June 30, 2014 actuarial valuation. Assumptions chosen by the Board based on this Experience Study are intended to remain in effect for at least two years.

**Historical Returns**

Currently, ERB assumes an investment return rate of 7.75%, net of investment and administrative expenses (changed in the last experience study from 8.00%). This is the rate used in discounting future payments in calculating the actuarial present value of those payments. The current assumption assumes inflation of 3.00% per annum and an annual real rate of return of 4.75%, net of expenses. Since the expense assumption has been 45 basis points, this means that the assumption is that the plan will earn a return 8.20% before expenses. The following chart shows the year-by-year returns, net of investment and administrative expenses, for the last ten fiscal years. While the plan did exceed the expected 7.75% return assumption in six of the last ten years, the average market return during this period was only 6.4%, which is less than the 7.75% assumption.



However, for this assumption, past performance, even averaged over a ten-year period, is not a reliable indicator of future performance. For example, if the examination period is extended from the last ten years to the last eighteen years, the average return increases to 7.5%.

### Asset Allocation and Development of Expected Return

The actual asset allocation of the trust fund will significantly impact the overall performance, so returns achieved under a different allocation are not meaningful. More importantly, the real rates of return for many asset classes, especially equities, vary so dramatically from year to year that even a ten-year period is not long enough to provide reasonable guidance.

A preferred approach to selecting an investment return assumption is to determine the median expected portfolio return given the fund's target allocation and given a set of capital market assumptions. Since we are not investment professionals, we looked at the results under the capital market assumptions used by several investment consulting firms, including: NEPC, JP Morgan, Towers Watson, Mercer, and Hewitt Ennis Knupp. These investment consulting firms periodically issue reports that describe their capital market assumptions, that is, their estimates of expected returns, volatility, and correlations for different asset classes.

Based on ERB's Investment Policy Statement, dated December 7, 2012, ERB's current target asset allocation is:

Asset Category	Target Allocation
Equities – Large Cap US	20%
Equities – Small/mid Cap US	2%
Equities – International (EAFE)	5%
Equities – Emerging Markets	10%
Fixed Income – Opportunistic Credit	20%
Fixed Income – Core Bonds	7%
Fixed Income – Emerging Market Debt	2%
Alternatives – Real Estate/REITS	5%
Alternatives – Real Assets	7%
Alternatives – Private Equity	8%
Alternatives – Absolute Returns	3%
Alternatives – Tactical Global Investments	5%
Alternatives – Risk Parity	5%
Cash Equivalents	1%
Total	100%

The target asset allocation has changed slightly since 2010 including a small shift from domestic large-cap equities and absolute return funds into core bonds and risk parity investments. When this allocation is applied against each of the investment consultant's 2012 capital market assumption set, the development of the average nominal return, net of investment expenses, is provided in the table below:

Investment Consultant	Expected Gross Return	Consultant Assumed Inflation	Expected Real Return (2)-(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Assumed Offset for Expenses	Expected Net Nominal Return (6)-(7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	7.69%	2.50%	5.19%	3.00%	8.19%	0.45%	7.74%
2	7.59%	2.40%	5.19%	3.00%	8.19%	0.45%	7.74%
3	8.28%	3.00%	5.28%	3.00%	8.28%	0.45%	7.83%
4	8.05%	2.50%	5.55%	3.00%	8.55%	0.45%	8.10%
5	8.22%	2.50%	5.72%	3.00%	8.72%	0.45%	8.27%
6	8.34%	2.50%	5.84%	3.00%	8.84%	0.45%	8.39%
7	9.21%	3.26%	5.95%	3.00%	8.95%	0.45%	8.50%
8	8.65%	2.16%	6.49%	3.00%	9.49%	0.45%	9.04%
Average	8.25%	2.60%	5.65%	3.00%	8.65%	0.45%	8.20%

We have determined for each investment consultant the expected nominal return rate, then subtracted that investment consultant's expected inflation to arrive at their expected real return in column 4. Then we have added back in our recommended inflation assumption and subtracted 0.45% for expenses to get an expected net nominal return. As the table shows, the average net one-year nominal return of the eight firms is 8.20% which is higher than the current 7.75% assumption. Equivalently, it also shows the expected net real return is 5.65%, higher than the current 4.75% assumption.

### Other Sources of Investment Return Forecasts

Another source of information is to review surveys of the investment assumption used by other systems and any trends in assumption changes. In March 2013, NASRA published their Public Fund Survey of 126 large public retirement systems where the average investment return assumption was 7.77%. Nearly one-half of the respondents have reduced investment assumption since 2008 and 53% of respondents were higher than 7.75%. These survey results reflect the nominal assumption in use or announced for use as of March 2013.

### Recommendation

Based on all of this information, we recommend that the Board maintain the current 4.75% net real return assumption and, therefore, maintain the 7.75% net nominal return assumption. The net nominal return assumption would be composed of 3.00% inflation, plus an assumed gross real return of 5.20%, and offset by 0.45% in expected investment and administrative expenses.

## SALARY INCREASE RATES

The current salary increase rates assumed for the valuation vary by service. They range from 13.50% for new members to 4.75% for members with 10 or more years of service.

Historically, the average pay increases for members active in both valuations for the last ten years, with at least one year of service, are as follows:

Period	Increase
FY 2002 to FY 2003	3.27%
FY 2003 to FY 2004	5.78%
FY 2004 to FY 2005	5.70%
FY 2005 to FY 2006	7.17%
FY 2006 to FY 2007	8.38%
FY 2007 to FY 2008	8.73%
FY 2008 to FY 2009	6.58%
FY 2009 to FY 2010	2.68%
FY 2010 to FY 2011	1.41%
FY 2011 to FY 2012	2.05%

The geometric average of these is 5.14%.

Salary increases are composed of both wage inflation and service-based promotional or merit increases. Wage inflation is currently assumed to be 4.75% (3.00% price inflation plus 1.75% productivity increases) with additional merit increases during the first 10 years of employment of up to 8.75%. The following will analyze these two components separately in developing our overall salary increase assumption.

### Wage Inflation for Long-Service Employees

Salary increases for longer-service employees are almost entirely driven by wage inflation. Many of the factors that result in pay increases are largely inapplicable or have diminished importance for longer-service employees. Step or service-related increases have ceased or are minimal. Promotions occur with less frequency. Additional training or acquisition of advanced degrees usually occurs early in the career. Thus, longer service employees' wages are assumed to grow at the overall rate of wage inflation. Wage inflation is also the increase in the average wage of all members of the workforce of the employer.

Historically, wage inflation almost always exceeds price inflation. This is because wage inflation is, in theory, the result of (a) price inflation, and (b) productivity gains being passed through to wages. For the last ten years, for the economy as a whole, wage inflation has outpaced price inflation by about 0.30%, and for the last twenty years, wage inflation has exceeded price inflation by about 0.79%. Since 1951, wage inflation has been about 1.00% a year higher than price inflation.

Wage inflation is currently assumed to be 4.75%, and this is the assumed salary increase for longer-service members with at least 10 years of service.

In 2003, New Mexico adopted a new three-tier licensure system for compensating classroom teachers. Once the system was adopted, it took a number of years before the majority of the classroom teachers were being compensated consistent with the new system. As a result, analyzing the individual salary increases over the past ten years may not be the best predictor of the average increase classroom teachers will expect to receive in the future from the new system. However, an analysis of the pay increases over the past five years should provide a much more reasonable estimate of how the pay will increase for an average classroom teacher in the future. Increases for members with 10 or more years of service remained fairly level. For these members, the observed average salary increase during the last five years was 2.64%. Inflation during this five-year period averaged 1.95%. Therefore, long-service employees received an average salary increase of 0.69% above inflation.

On this basis and the overall downward pressure on wages, we recommend decreasing the productivity increase from 1.75% to 1.25% for a total wage inflation assumption of 4.25%.

### **Additional Merit Increases for Shorter-Service Employees**

Members who are early in their career typically have salary increases that include both wage inflation as well as a component for promotion. This additional component is part of the age and service component of the salary scale.

Based on the data for the last five years, merit-based increases for members in the first ten years of employment were generally in line with the current assumptions. For example, active members with five years of service received an average total increase of 3.95%. If you remove the 2.64% wage inflation that was observed for the last five years, then the data indicates that these members received a merit increase of approximately 1.31% compared to our current assumption of 1.00%. See the table on the last page of the report for additional details on these results.

Based on the findings from the attached tables, we recommend no change to the assumed salary increase rates for members with less than 10 years of service. If we combine this result with our 4.25% recommendation for wage inflation, the result is a total salary increase assumption ranging from 13.00% for new members to 4.25% for members with 10 or more years of service.

## **PAYROLL GROWTH RATE**

The salary increase rates discussed above are assumptions applied to individuals. They are used in projecting future benefits. We also use a separate payroll growth assumption, currently 3.75%, in determining the amount needed to amortize the unfunded actuarial accrued liability. The amortization payments are calculated to be a level percentage of payroll, so as payroll increases over time, these charges do too. The amortization percentage is dependent on the rate at which payroll is assumed to increase.

Note that the payroll growth assumption is also used in our projections to increase the new entrant pay each year and to project future ARP contributions.

This chart below shows the membership and payroll growth for the last six years:

Fiscal Year	Membership Growth	Payroll Growth	Adjusted Payroll Growth
2012	-1.33%	-1.15%	0.18%
2011	-2.56%	-2.02%	0.56%
2010	-0.82%	-0.39%	0.44%
2009	0.19%	3.78%	3.59%
2008	1.61%	6.43%	4.74%
2007	1.39%	5.49%	4.04%
Average	-0.26%	1.97%	2.24%

Over the last six years, payroll growth has averaged 2.0%, down from the 3.1% measured in the last experience study, and it has averaged 2.4% over the last ten years, both less than the current assumption of 3.75%.

Payroll can grow at a rate different from the average pay increase for individual members. There are two reasons for this. First, when older, longer-service members terminate, retire or die, they are generally replaced with new teachers who have a lower salary. Because of this, in most populations that are not growing in size, the growth in total payroll will be smaller than the average pay increase for members. Second, payroll can grow due to an increase in the size of the group. However, GASB 25 prohibits systems from using anticipated membership growth in setting the payroll growth assumption. Over the last six years, payroll growth after adjusting for the membership changes has averaged 2.2%.

Theoretically, over the long term the total payroll for a population of constant size should grow at about the rate that starting pays increase. These will generally rise with inflation, plus some adjustment for the excess of wage inflation over price inflation, plus an industry-specific adjustment. However, because of the lack of turnover in the last few years combined with stagnant individual wage increases, payroll growth has been less than assumed. Additionally, because of the baby boomer retirements expected over the next 10-15 years, we expect actual payroll growth to lag behind the wage inflation assumption. Therefore, we recommend a decrease to the payroll growth rate from 3.75% down to 3.50%. This has no impact on the current liabilities of ERB, but it does impact the amortization period, since we assume there will be fewer contributions in the future that can be used to amortize the unfunded actuarial accrued liability.

## POST-RETIREMENT MORTALITY RATES

The mortality table currently being used for non-disabled retirees and for beneficiaries receiving benefits is the RP-2000 Combined Mortality Table with White Collar Adjustment projected to 2010. The table has separate rates for males and females. The mortality rates are scaled back to 90% of the published mortality rates and are further adjusted by applying a one-year setback for both males and females. (Set-backs and set-forwards are traditional actuarial techniques used to adjust a



table to match the actual observed data. When a table is set back one year, the actuary uses the table's rate for the age one year younger than the person's actual age. For example, the mortality rate used for a 60-year old male retiree is 90% of rate in the RP-2000 Combined Mortality Table with White Collar Adjustment projected to 2010 for males at age 59.)

There were 1,826 deaths among the male retirees and 2,291 deaths among female retirees during the last six years. (These figures exclude deaths among beneficiaries and disabled retirees.) Based on the current tables, we expected 1,525 and 2,174 deaths respectively. This produced A/E ratios of 120% for males and 105% for females. This is a reasonably good match overall although both ratios are on the edge of the acceptable range (generally, an acceptable range for the ratios should range from 105% to 120% to introduce some conservatism) but we expect to see continuing mortality improvement (longer life expectancies) which will decrease the ratios in the future. For this assumption, an A/E ratio higher than 100% has traditionally been desired to build in a margin of conservatism to allow for continued future improvements in mortality rates.

The results of this analysis are shown in following pages.

<b>Post-Retirement Mortality (non-disabled) – Males</b>					
		Current Assumption		Proposed Assumption	
Age	Actual deaths	Expected deaths	A/E ratio*	Expected deaths	A/E ratio*
50-54	7	3	218%	3	217%
55-59	34	17	200%	18	192%
60-64	73	54	135%	59	124%
65-69	149	127	118%	135	111%
70-74	210	184	114%	194	108%
75-79	320	268	119%	289	111%
80-84	372	330	113%	362	103%
85-89	370	308	120%	338	110%
90-94	198	173	115%	188	105%
95-99	84	58	146%	61	137%
100-104	7	4	189%	4	181%
Other	2	0	667%	0	645%
Totals	1,826	1,525	120%	1,651	111%

\* Expected deaths are rounded to the nearest number. A/E ratios are based on the unrounded number of expected deaths.

Post-Retirement Mortality (non-disabled) – Females					
		Current Assumption		Proposed Assumption	
Age	Actual deaths	Expected deaths	A/E ratio*	Expected deaths	A/E ratio*
50-54	5	5	107%	4	113%
55-59	37	29	127%	29	130%
60-64	93	95	98%	93	100%
65-69	167	198	85%	195	86%
70-74	198	265	75%	260	76%
75-79	270	326	83%	318	85%
80-84	388	372	104%	363	107%
85-89	501	399	126%	393	128%
90-94	384	319	120%	317	121%
95-99	201	143	141%	142	141%
100-104	43	22	193%	22	193%
Other	4	1	645%	1	667%
Totals	2,291	2,174	105%	2,137	107%

\* Expected deaths are rounded to the nearest number. A/E ratios are based on the unrounded number of expected deaths.

While the overall match is reasonable, the male table has developed a little bit too much margin and on the other hand we would like to see the female table include a little bit more margin to allow for further improvements in life expectancies. Therefore, we recommend modifying the current assumption by projecting mortality improvements for an additional four years to 2014 for both males and females and by removing the setback on the male table. Projecting both tables an extra four years will build in a little more margin (fixing the female table) and then removing the setback from the male table will remove the excess margin. These changes will still provide a good fit to the recent experience and allow for margins for future mortality improvements.

### Static versus Generational Mortality Improvements

The current assumption applies mortality improvements to the published RP-2000 mortality table for a fixed number of years (e.g., 14 years) and the resulting set of mortality rates is used for every future year in the valuation projection. This approach is referred to as a “static” mortality projection and is a commonly accepted approach to setting mortality assumptions. Since this approach does not assume continuing mortality improvement beyond the fixed number of years at the valuation date, the assumption must include a margin of conservatism to allow for future

improvements in mortality rates. As long as the mortality of ERB annuitants continues to improve, this margin will periodically need to be reestablished.

The other commonly accepted approach to incorporating mortality improvement into an actuarial valuation of a pension plan is referred to as “generational” mortality projection. A generational mortality projection does not build in a margin up front, but the mortality is assumed to improve every future year in the valuation projection. Since this form of mortality projection assumes continual mortality improvements, there should be no need to periodically reestablish margin for future mortality improvements in the mortality assumption.

The Society of Actuaries’ Retirement Plans Experience Committee initiated a Pension Mortality Study in 2010 that is expected to be completed prior to the next experience study for ERB. The completed study should include new methods and procedures for incorporating generational mortality into actuarial valuations of a pension plans. Once this Study is published, we will review the findings of the Study and report on the applicability and appropriateness of the Study to ERB at the next experience study.

## **DISABLED MORTALITY RATES**

This assumption does not have a significant impact on the liabilities of ERB. There were 88 male deaths and 100 female deaths among the disabled retirees during the six-year study period. This produced A/E ratios of 112% and 83% respectively, and 95% overall. At the time of the last experience study, the A/E ratios were 108% for males, 92% for females, and 98% overall. Due to the small sample size as well as conservative A/E ratios, we recommend no change for male mortality rates. However, we recommend scaling the female mortality rates back to 90% of the current assumption to get an A/E ratio closer to 100%. The results of this analysis are shown below:

<b>Disability Mortality – Males</b>			
Age	Actual deaths	Expected deaths	A/E ratio*
40-44	0	1	0%
45-49	3	2	136%
50-54	12	6	197%
55-59	13	10	125%
60-64	15	12	124%
65-69	8	9	91%
70-74	8	9	90%
75-79	12	9	137%
80-84	8	9	92%
85-89	6	6	105%
90-94	2	3	58%
Other	1	3	35%
Totals	88	79	112%

\* Expected deaths are rounded to the nearest number. A/E ratios are based on the unrounded number of expected deaths.

Disability Mortality – Females					
		Current Assumption		Proposed Assumption	
Age	Actual deaths	Expected deaths	A/E ratio*	Expected deaths	A/E ratio*
40-44	1	1	172%	1	191%
45-49	2	4	56%	3	62%
50-54	9	10	91%	9	101%
55-59	13	18	72%	16	80%
60-64	12	22	54%	20	60%
65-69	19	18	106%	16	117%
70-74	12	13	93%	12	104%
75-79	9	10	86%	9	96%
80-84	7	12	57%	11	63%
85-89	7	6	109%	6	121%
90-94	6	3	177%	3	196%
Other	3	2	130%	2	145%
Totals	100	120	83%	108	92%

\* Expected deaths are rounded to the nearest number. A/E ratios are based on the unrounded number of expected deaths.

## ACTIVE MORTALITY RATES

A separate plan-specific mortality table is used for active members. The results of this analysis are shown below:

Active mortality rates	Males	Females	Total
<b>Current Assumption</b>			
Number of actual deaths	224	223	447
Number of expected deaths	210	270	480
A/E ratio	107%	82%	93%
<b>Proposed Assumption</b>			
Number of expected deaths	210	233	443
A/E ratio	107%	96%	101%

The number of actual deaths is considerably higher than that reported by ERB for the six-year period. This is a common occurrence for many of our clients, especially when the beneficiary of a deceased active member only receives a refund of contributions, because the data we receive generally indicates that the active member terminated. Because of situations similar to this, we augmented the data by performing a check against the Social Security Administration (SSA) database for additional deaths among the members originally reported as terminations. The A/E ratio is 107% for males and 82% for females. Therefore, we recommend that we make no change to the current assumed mortality rates for male members but we recommend applying a two-year setback to the assumption for females.

## DISABILITY RATES

This assumption does not have a significant impact on the liabilities of ERB. The A/E ratio was 89% for males and 66% for females, and on a combined basis it was 73%. In the 2010 experience study the A/E ratios were 99% for males, 81% for females and 87% overall. The results of this analysis are shown below:

Active disability rates	Males	Females	Total
Number of actual disabilities	84	125	209
Number of expected disabilities	95	190	285
A/E ratio	89%	66%	73%

The overall A/E has trended down for the last three studies (111% for males, 89% for females, and 96% overall in the 2008 study), particularly for females, suggesting that disability experience is improving. However, the improvement for females appears to be primarily in the older ages, 55 to 65, whereas the experience for males remains fairly stable at these ages, suggesting possible inconsistencies in the data reporting (e.g., disability retirements reported for the valuation without disability indicator). Therefore, since this assumption has such a minor impact, we recommend leaving this assumption unchanged again this year but with the expectation that we may update this assumption in the next study if the A/E ratios continue to trend down.

## RETIREMENT RATES

We currently use retirement rates that vary by age, service, and sex. There were 3,029 male retirements during the six-year period, and there were 6,793 female retirements. This includes only members who retired from active status. It excludes those who were inactive for over a year before retiring.

The analysis shows A/E ratios of 99% for males and 92% for females. (Rates less than 100% are conservative.) In the last study, the A/E was 104% for males and 102% for females. For the current study, the A/E's for members with at least 25 years of service—these are the members with the largest liability—are 103% for males and 91% for females. The A/E's for members who met the Rule of 75 (with at least age 60) are 103% for males and 95% for females. However, the A/E's for members who became eligible for normal retirement upon attaining age 65 with 5 years of

service are 82% for males and 89% for females. Additionally, the average retirement age for males is 59.8 (actual) vs. 60.4 (expected). For females, these ages are 59.5 (actual) and 59.7 (expected). In the last experience study, the actual ages at retirement were 59.4 (males) and 59.3 (females).

We believe there is a reasonably good match between the actual experience and the assumptions, and we recommend leaving the current assumptions relatively unchanged. The only recommended changes are slight adjustments to the assumed rates of retirement, primarily between the ages of 61 to 65, to better reflect the patterns of retirement at each age. Under the recommended assumption, the overall A/E for females would change from 92% to 94% and the expected age at retirement would be 59.6. Similarly, the A/E for males would change from 99% to 100% and the expected age at retirement would be 60.3. A more detailed summary of this analysis is included in Section VII of this report.

Currently, members who joined ERB on or before June 30, 2010 are considered Tier 1 and are eligible for an unreduced retirement benefit upon the earliest of age 65 with 5 years of service, Rule of 75 (with at least age 60), or 25 years of service. Members hired on or after July 1, 2010 are considered Tier 2 and are eligible for an unreduced benefit upon the earliest of age 67 with 5 years of service, Rule of 80 (with at least age 65), or 30 years of service. Under SB115 enacted during the past legislative session, members hired on or after July 1, 2013 are considered Tier 3 and are eligible for an unreduced benefit upon the earliest of age 67 with 5 years of service, Rule of 80 (with at least age 65), or age 55 with 30 years of service. Although there is data available on members retiring with 30 years of service, there is not relevant data for members who were required to have that much service to attain eligibility and it would be inappropriate to base a new assumption on these actual results. Therefore, we have established assumed retirement rates for Tier 2 and Tier 3 based on reasonable adaptations of the observed retirement rates for Tier 1, considering their less generous eligibility provisions. New relevant data for analyzing this assumption will not be available for several years.

## **TERMINATION RATES**

Termination rates reflect members who leave for any reason other than death, disability or service retirement. They apply whether the termination is voluntary or involuntary, and whether the member takes a refund or keeps his/her account balance on deposit in ERB. The current termination rates reflect the member's age, service and sex.

In the aggregate, the current assumptions produce an A/E ratio of 101% for males and 102% for females. For this assumption, A/E ratios over 100% are conservative. This is a reasonably good match and we could leave the current rate structure intact, with a couple of minor changes, and be confident that the assumption would continue to match actual experience well.

However, a current termination assumption that is split by age and service and may be needlessly over-complicated and can make analysis of the actual experience difficult. Also, when one of the primary retirement eligibilities is a service-based requirement only, such as the valuable 25-year requirement for ERB, an age-based termination assumption has increasingly less bearing as a member approaches the service-based retirement eligibility. In other words, as a member gets close to reaching 25 years of service, their decision to terminate becomes less dependent on their age and more dependent on how many years they have left to reach the 25-year threshold. Given

this plan feature, we recommend a structural change from an age-and-service based table to a more simplified service-only based table. This structural change is not a significant change in the expected pattern of terminations and results in virtually no change to the overall A/E ratio.

Also, it appears that the data provided to ERB by some employers does not always include date of birth early in a member's career, but generally does have reasonable service data. For valuation purposes, this missing data is completed in our data preparation by assuming a constant age at hire consistent with the average for all other active members. This method of completing the missing data is not uncommon in the actuarial valuations of large retirement systems and this practice has worked well for ERB since we have never measured significant gains or losses from the termination decrement, as the missing dates of birth eventually are updated in the data provided to us for the annual valuation. This limitation in the valuation data for certain short-serviced members provides one additional justification for transitioning the assumed termination rates to a service-only based table.

<b>Termination Rates – Males</b>					
		Current Assumption		Proposed Assumption	
Service Years	Actual terms	Expected terms	A/E ratio	Expected terms	A/E ratio
0-4	12,129	11,947	102%	12,099	100%
5-9	1,985	1,888	105%	1,970	101%
10 or more	1,000	1,093	91%	870	115%
Totals	15,114	14,929	101%	14,939	101%

<b>Termination Rates – Females</b>					
		Current Assumption		Proposed Assumption	
Service Years	Actual terms	Expected terms	A/E ratio	Expected terms	A/E ratio
0-4	13,572	13,713	99%	13,541	100%
5-9	4,912	4,762	103%	4,886	101%
10 or more	2,633	2,136	123%	2,401	110%
Totals	21,117	20,610	102%	20,828	101%

## **OTHER ASSUMPTIONS AND REFUNDS**

There are other assumptions made in the course of a valuation, such as the percentage of members who are married, the age difference between husbands and wives (both of which only impact the death benefit liability), the likelihood that a terminating employee will take a refund, etc, all of which have a minor impact on liabilities. We reviewed these, and believe these are generally realistic or conservative, so we decided to recommend no changes to these other assumptions.



## ACTUARIAL METHODS

### Actuarial Funding Cost Method

We have reviewed the actuarial cost method being used—the Entry Age Normal (EAN) cost method—and we continue to believe that this is the method of choice for this plan, since this method usually does the best job of keeping costs level as a percentage of payroll. It is by far the most commonly used actuarial cost method for large public retirement systems.

The plan specifically uses the Individual Entry Age Normal actuarial cost method. This method will base the normal cost calculation on the individual members currently in the valuation and the benefit provisions that apply to that individual (as opposed to basing the normal cost on a hypothetical group of new entrants). For instance, that means the normal cost for Tier 1 members will be based on their benefits and eligibilities and, likewise, the normal cost for Tier 2 and Tier 3 members will be based on their respective benefits and eligibilities.

### Asset Valuation Method

We believe the method used to determine the actuarial value of assets (AVA) is appropriate, since it does a good job of smoothing asset gains and losses, and reduces fluctuations in the funding period. The current method smoothes the differences between the expected returns (based on the annual investment return assumption) and actual returns, net of expenses, over a five-year period. This method of determining the actuarial value of assets is very common. It does not distinguish between types of return (interest, dividends, realized gains/losses, and unrealized gains/losses) like some other methods. It treats different asset classes and different investment styles the same. We do not believe the method has a bias relative to market. In other words, we expect the ratio of the AVA to MVA to average about 100% over the very long term. Therefore, we recommend no change to this method.

### Membership Growth

As part of the valuation process, a thirty-year projection is performed of the plan's funded ratio and annual required contribution. Currently, these projections assume the active membership in the plan will grow 0.75% per year over the projection period. However, over the last five to ten years, the membership has been virtually flat or even a slight decrease. (See the payroll growth assumption discussion earlier in this report for additional detail regarding recent membership growth.) Although this period has been impacted by the recent recession and budget constraints that may have affected hiring patterns, the 0.75% growth assumption is probably still too aggressive going forward for a mature plan like ERB, especially since the membership growth assumption is in addition to the annual wage inflation of over 4% for continuing members. Therefore, we recommend decreasing this assumption to 0.50% growth in the active membership. Since the contributions received on the payroll of members hired after July 1, 2013 exceed their normal cost, every additional member assumed to participate in ERB will serve to pay down the unfunded liability over a shorter period of time (i.e., lower population growth results in a lower projected funded ratio). However, this assumption has no impact on the annual valuations since the valuation is a snapshot based only on the plan membership on the valuation date.

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## **SECTION IV**

### ACTUARIAL IMPACT OF RECOMMENDATIONS

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## Actuarial Impact of Recommendations

The employers' Annual Required Contribution (ARC) for GASB reporting purposes is determined actuarially, based on the plan provisions in effect as of the valuation date, the actuarial assumptions adopted by the Board, and the methodology set forth in the statutes. The member and employer contribution rates are set in statute and are not directly impacted by the annual actuarial valuation. However, the actuarial valuation assesses the adequacy of the statutory contribution rates on an annual basis.

The ARC and plan liabilities are computed using the Entry Age actuarial cost method. The ARC is the sum of two pieces: the employer normal cost rate and the amortization rate. The total normal cost rate is determined as a percent of pay. The employer normal cost is the difference between the total normal cost rate and the member contribution rate. The amortization rate is determined as a level percent of pay. It is the amount required to amortize the unfunded actuarial accrued liability over 30 years.

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. In the absence of benefit improvements and assuming that the contribution rates are sufficient to pay for at least the normal cost and the interest accruing on the unfunded liability, the funded ratio should increase over time until it reaches 100%.

### Impact on Valuation Results

The combined impact of all proposed assumption changes, compared to the results of the June 30, 2012 actuarial valuation, is summarized in the following table. Sensitivity to each of the proposed assumption changes has also been included in the next section of the report.

	June 30, 2012 <u>Actuarial Valuation</u>	Impact of <u>Experience Study</u>
Normal Cost %	13.79%	13.10%
Unfunded actuarial accrued liability (UAAL)	\$ 6,231 million	\$ 6,155 million
Funded Ratio	60.7%	61.0%
GASB ARC	17.59%	17.10%
Projected Funded Ratio in 2043*	100.7%	97.1%

\* Projected funded ratio in 2043 incorporates the provisions of SB 115 and the December 31, 2012 market value of assets of \$9.9 billion.

**Impact of Individual Proposed Changes**

The following table itemizes the impact of the individual proposed assumption changes on three key valuation results.

	June 30, 2012 <u>Funded Ratio</u>	<u>FY2013 ARC</u>	Projected June 30, 2043 <u>Funded Ratio*</u>
Final June 30, 2012 Actuarial Valuation	60.7%	17.59%	100.7%
Proposed Assumption Changes			
Mortality Assumption	0.1	(0.08)	0.9
Retirement Rates	0.0	(0.04)	0.4
Termination Rates	(0.3)	0.11	(3.7)
Wage Inflation	0.5	(0.81)	5.4
Payroll Growth	N/A	0.33	(2.5)**
Population Growth	N/A	N/A	(4.1)
Resulting Impact of Proposed Assumption Changes	61.0%	17.10%	97.1%

\* *Projected funded ratio in 2043 incorporates the provisions of SB 115 and the December 31, 2012 market value of assets of \$9.9 billion.*

\*\* *Only impacts the increase in the assumed pay for new hires entering the plan each year and the increase in ARP contributions each year in the future.*

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## **SECTION V**

### SUMMARY OF RECOMMENDATIONS

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## Summary of Recommendations

As noted previously, we recommend making the following changes to the current actuarial assumptions and actuarial methods:

- Changes to post-retirement mortality
- Changes to disabled mortality
- Changes to active mortality
- Changes to retirement rates
- Change to service-based termination table
- Decrease wage inflation from 4.75% to 4.25%
- Decrease payroll growth from 3.75% to 3.50%
- Change the population growth assumption to 0.50% per year (no impact on valuation results)

We recommend that the Board formally accept this report and adopt the proposed assumptions for the June 30, 2013 and June 30, 2014 actuarial valuations.

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## **SECTION VI**

SUMMARY OF ASSUMPTIONS  
AND METHODS INCORPORATING  
THE RECOMMENDED ASSUMPTIONS

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I. Valuation Date

The valuation date is June 30th of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

II. Actuarial Cost Method

The contribution rate is set by statute for both employees and for the employers. The funding period is determined, as described below, using the Individual Entry Age Normal actuarial cost method.

The Individual Entry Age Normal actuarial cost method assigns the plan's total unfunded liabilities (the actuarial present value of future benefits less the actuarial value of assets) to various periods. The unfunded actuarial accrued liability is assigned to years prior to the valuation, and the normal cost is assigned to the year following the valuation. The remaining costs are the normal costs for future years. Then each year's contribution is composed of (i) that year's normal cost, plus (ii) a payment used to reduce the unfunded actuarial accrued liability.

The normal contribution is determined using the Entry Age Normal method. Under this method, a calculation is made to determine the rate of contribution which, if applied to the compensation of each individual member during the entire period of anticipated covered service, would be required to meet the cost of all benefits payable on his behalf. The salary-weighted average of these rates is the normal cost rate. This calculation reflects the plan provisions that apply to each individual member. The employer normal cost rate is equal to (i) the normal cost rate, minus (ii) the member contribution rate.

The actuarial accrued liability is the difference between the total present value of future benefits and the actuarial present value of future normal costs. The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of assets.

The balance of the employers' contributions--the remainder after paying their share of the normal cost--is used to reduce the unfunded actuarial accrued liability. The funding period is the length of time required for the unfunded actuarial accrued liability to be completely amortized, assuming that the portion used to reduce the unfunded remains level as a percentage of total payroll, which is assumed to grow 3.75% per year. The 3.00% contribution made by employers to ERB on behalf of employees who elected to participate in the Alternative Retirement Plan is also used to amortize the unfunded actuarial accrued liability.

It is assumed that contributions are made monthly at the end of the month.



### III. Actuarial Value of Assets

The actuarial value of assets is based on the market value of assets with a five-year phase-in of actual investment return in excess of (less than) expected investment income. Expected investment income is determined using the assumed investment return rate and the market value of assets (adjusted for receipts and disbursements during the year). Returns are measured net of all investment and administrative expenses.

### IV. Actuarial Assumptions

#### A. Economic Assumptions

1. Investment return: 7.75%, compounded annually, net of expenses. This is made up of a 3.00% inflation rate and a 4.75% real rate of return.
2. Salary increase rate: Inflation rate of 3.00% plus productivity increase rate of 1.25% plus step-rate/promotional as shown:

<u>Years of Service</u>	<u>Annual Step-Rate/Promotional Component Rates of Increase</u>	<u>Total Annual Rate of Increase</u>
0	8.75%	13.00%
1	3.00%	7.25%
2	2.00%	6.25%
3	1.50%	5.75%
4	1.25%	5.50%
5	1.00%	5.25%
6	0.75%	5.00%
7	0.50%	4.75%
8	0.50%	4.75%
9	0.50%	4.75%
10 or more	0.00%	4.25%

3. Cost-of-living increases: 2% per year, compounded annually. Note that increases are deferred until July 1 following the year a member retires, or the year in which a member attains the age of 65, whichever is later or, for disabled retirees, until July 1 of the third year following retirement. Also, members who retired prior to July 1, 1984 and who are younger than age 65 receive an annual increase.
4. Payroll growth: 3.50% per year (with no allowance for membership growth)
5. Contribution accumulation: Member contributions are assumed to have grown at 5.50% per year, with 4.00% interest, compounded annually, applicable to the account balances in the past as well as the future.

B. Demographic Assumptions

1. Mortality after termination or retirement -
  - a. Healthy males - 90% of RP-2000 Combined Mortality Table with White Collar Adjustment for males, projected to 2014
  - b. Healthy females - 90% of RP-2000 Combined Mortality Table with White Collar Adjustment for females, set back one year, projected to 2014
  - c. Disabled males - 1981 Disability Table
  - d. Disabled females – 90% of 1981 Disability Table
  - e. To account for future mortality improvement, the tables selected for nondisabled annuitants were chosen so that the assumed mortality rates are smaller than the rates observed in the most recent experience study, covering experience for FYE 2007 to FYE 2012. The ratio of the actual number of deaths occurring during this period to the expected number based on the selected assumptions was:
    - i. 111% for nondisabled male annuitants
    - ii. 107% for nondisabled female annuitants.

No mortality improvement assumption was made for disabled retirees or active members.

See sample rates below:

Age	Deaths per 100 Lives			
	Healthy Males	Healthy Females	Disabled Males	Disabled Females
40	.07	.04	1.76	1.58
45	.10	.07	2.08	1.87
50	.14	.10	2.42	2.18
55	.23	.18	2.83	2.55
60	.40	.35	3.29	2.96
65	.82	.64	3.76	3.38
70	1.40	1.13	4.36	3.92
75	2.48	1.89	5.62	5.05
80	4.65	3.16	8.84	7.95
85	8.54	5.42	12.95	11.65

2. Mortality rates of active members - As shown below for sample ages:

Age	Deaths per 100 Members	
	Males	Females
25	.10	.03
30	.10	.01
35	.08	.03
40	.08	.04
45	.11	.04
50	.15	.08
55	.23	.14
60	.31	.21
65	.46	.28

3. Disability - As shown below for selected ages (rates are only applied to eligible members — members with at least 10 years of service):

Age	Occurrence of Disability per 100 Members	
	Males	Females
25	.00	.00
30	.00	.03
35	.06	.07
40	.13	.12
45	.19	.16
50	.24	.19
55	.26	.20
60	.24	.19
65	.18	.16

4. Retirement - Select and ultimate as shown below for selected ages (rates are only applied to members eligible for retirement):

**Retirement Per 100 Members – Members Hired before July 1, 2010**

Age	Males - Years of Service					
	0-4	5-9	10-14	15-19	20-24	25+
45	0.00	0.00	0.00	0.00	0.00	15.00
50	0.00	0.00	0.00	0.00	0.00	18.00
55	0.00	0.00	0.00	0.00	5.00	20.00
60	0.00	0.00	0.00	15.00	20.00	25.00
62	0.00	0.00	30.00	30.00	30.00	30.00
65	0.00	40.00	35.00	30.00	30.00	30.00
70	100.00	100.00	100.00	100.00	100.00	100.00

Age	Females - Years of Service					
	0-4	5-9	10-14	15-19	20-24	25+
45	0.00	0.00	0.00	0.00	0.00	15.00
50	0.00	0.00	0.00	0.00	0.00	18.00
55	0.00	0.00	0.00	0.00	6.00	23.00
60	0.00	0.00	0.00	20.00	15.00	25.00
62	0.00	0.00	40.00	30.00	30.00	35.00
65	0.00	35.00	40.00	40.00	40.00	40.00
70	100.00	100.00	100.00	100.00	100.00	100.00

**Retirement Per 100 Members – Members Hired on or after  
July 1, 2010 and before July 1, 2013**

Age	Males - Years of Service						
	0-4	5-9	10-14	15-19	20-24	25-29	30+
50	0.00	0.00	0.00	0.00	0.00	0.00	30.00
55	0.00	0.00	0.00	0.00	0.00	5.00	40.00
60	0.00	0.00	0.00	0.00	20.00	25.00	40.00
62	0.00	0.00	0.00	30.00	30.00	30.00	40.00
67	0.00	25.00	40.00	45.00	45.00	45.00	45.00
70	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Age	Females - Years of Service						
	0-4	5-9	10-14	15-19	20-24	25-29	30+
50	0.00	0.00	0.00	0.00	0.00	0.00	30.00
55	0.00	0.00	0.00	0.00	0.00	6.00	43.00
60	0.00	0.00	0.00	0.00	15.00	30.00	45.00
62	0.00	0.00	0.00	30.00	30.00	35.00	45.00
67	0.00	35.00	35.00	35.00	35.00	35.00	35.00
70	100.00	100.00	100.00	100.00	100.00	100.00	100.00

**Retirement Per 100 Members – Members Hired on or after**  
**July 1, 2013**

Age	Males - Years of Service						
	0-4	5-9	10-14	15-19	20-24	25-29	30+
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	5.00	45.00
60	0.00	0.00	0.00	0.00	20.00	25.00	40.00
62	0.00	0.00	0.00	30.00	30.00	30.00	40.00
67	0.00	25.00	40.00	45.00	45.00	45.00	45.00
70	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Age	Females - Years of Service						
	0-4	5-9	10-14	15-19	20-24	25-29	30+
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	6.00	48.00
60	0.00	0.00	0.00	0.00	15.00	30.00	45.00
62	0.00	0.00	0.00	30.00	30.00	35.00	45.00
67	0.00	35.00	35.00	35.00	35.00	35.00	35.00
70	100.00	100.00	100.00	100.00	100.00	100.00	100.00

5. Termination (for causes other than death, disability or retirement) - Service-based rates are applied as follows:

Completed Service	Terminations per 100 Members	
	Males	Females
0	43.4	31.4
1	28.1	23.8
2	19.6	17.2
3	14.3	13.5
4	11.9	10.6
5	10.0	9.8
6	9.1	8.6
7	7.3	7.2
8	6.1	6.3
9	5.7	5.5
10	5.2	5.0
11	4.2	4.7
12	4.0	4.2
13	3.4	3.6
14	3.4	3.5
15	3.1	3.3
16	2.2	2.3
17	2.3	2.7
18	2.3	2.1
19 and over	0.0	0.0

Rates are not applied after the member is eligible for reduced or unreduced retirement benefits.

### C. Other Assumptions

1. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses. All beneficiaries are assumed to be spouses.
2. Percent electing annuity on death: It is assumed that beneficiaries of deceased members will elect to receive the refund of contributions with interest, unless the member is eligible for early or normal retirement, in which case the beneficiary will elect to receive the survivor annuity.
3. Percent electing deferred termination benefit: All vested active members terminating prior to eligibility for a retirement benefit are assumed to elect the more valuable of (i) an immediate refund, or (ii) a deferred annuity commencing when the member is eligible for an unreduced retirement benefit.
4. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt when eligible for an unreduced benefit (or attained age if later).
5. Investment and administrative expenses: The assumed investment return rate is intended to be the net rate of return after payment of all investment and administrative expenses.
6. Percent married: For valuation purposes 100% of members are assumed to be married.

### V. Participant Data

Participant data was supplied on electronic file for (i) active members, (ii) inactive members, who are entitled to either a future deferred benefit or a refund of their employee contributions and the accumulated interest, and (iii) members and beneficiaries receiving benefits.

The data for active and inactive, non-retired members included birth date, sex, years of service, salary, and accumulated employee contributions (without interest). For retired members and beneficiaries, the data included date of birth, sex, beneficiary or joint annuitant date of birth (where applicable), current monthly benefit, date of retirement, and a form of payment code.

Salary supplied for the current year was the total earnings for the year preceding the valuation date. We have not subjected this data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data.

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## **SECTION VII**

### SUMMARY OF DATA AND EXPERIENCE

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**NON-DISABLED EMPLOYEES  
POST-RETIREMENT MORTALITY - MALE**

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	7	1,807	0.0039	0.0017	0.0017	3	3	218%	217%
55-59	34	5,845	0.0058	0.0028	0.0029	17	18	200%	192%
60-64	73	10,556	0.0069	0.0049	0.0053	54	59	135%	124%
65-69	149	12,831	0.0116	0.0099	0.0105	127	135	118%	111%
70-74	210	11,107	0.0189	0.0166	0.0174	184	194	114%	108%
75-79	320	9,052	0.0354	0.0295	0.0317	268	289	119%	111%
80-84	372	6,110	0.0609	0.0549	0.0603	330	362	113%	103%
85-89	370	3,225	0.1147	0.0980	0.1077	308	338	120%	110%
90-94	198	1,078	0.1837	0.1686	0.1830	173	188	115%	105%
95-99	84	244	0.3443	0.2505	0.2624	58	61	146%	137%
100-104	7	12	0.5833	0.3228	0.3345	4	4	189%	181%
Other	2	252	0.0079			0	0	667%	645%
Totals	1,826	62,119				1,525	1,651	120%	111%

**NON-DISABLED EMPLOYEES**  
**POST-RETIREMENT MORTALITY - FEMALE**

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current (3) * (5)	Proposed (3) * (6)	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
50-54	5	3,230	0.0015	0.0014	0.0013	5	4	107%	113%
55-59	37	11,086	0.0033	0.0025	0.0024	29	29	127%	130%
60-64	93	20,316	0.0046	0.0045	0.0044	95	93	98%	100%
65-69	167	23,568	0.0071	0.0084	0.0082	198	195	85%	86%
70-74	198	18,664	0.0106	0.0143	0.0140	265	260	75%	76%
75-79	270	13,767	0.0196	0.0237	0.0229	326	318	83%	85%
80-84	388	9,390	0.0413	0.0402	0.0391	372	363	104%	107%
85-89	501	5,760	0.0870	0.0709	0.0695	399	393	126%	128%
90-94	384	2,728	0.1408	0.1210	0.1195	319	317	120%	121%
95-99	201	840	0.2393	0.1812	0.1797	143	142	141%	141%
100-104	43	105	0.4095	0.2204	0.2204	22	22	193%	193%
Other	4	404	0.0074			1	1	645%	667%
Totals	2,291	109,858				2,173	2,138	105%	107%

**POST-RETIREMENT DISABILITY MORTALITY - MALE**

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40 - 44	0	30	0.0000	0.0187	0.0187	1	1	0%	0%
45 - 49	3	98	0.0306	0.0222	0.0222	2	2	136%	136%
50 - 54	12	234	0.0513	0.0258	0.0258	6	6	197%	197%
55 - 59	13	341	0.0381	0.0304	0.0304	10	10	125%	125%
60 - 64	15	348	0.0431	0.0349	0.0349	12	12	124%	124%
65 - 69	8	220	0.0364	0.0403	0.0403	9	9	91%	91%
70 - 74	8	189	0.0423	0.0466	0.0466	9	9	90%	90%
75 - 79	12	135	0.0889	0.0660	0.0660	9	9	137%	137%
80 - 84	8	84	0.0952	0.1040	0.1040	9	9	92%	92%
85 - 89	6	39	0.1538	0.1485	0.1485	6	6	105%	105%
90 - 94	2	17	0.1176	0.2020	0.2020	3	3	58%	58%
95 +	1	11	0.0909	0.2730	0.2730	3	3	35%	35%
Totals	88	1,746				79	79	112%	112%

**POST-RETIREMENT DISABILITY MORTALITY - FEMALE**

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
40 - 44	1	30	0.0333	0.0187	0.0168	1	1	172%	191%
45 - 49	2	158	0.0127	0.0222	0.0199	4	3	56%	62%
50 - 54	9	379	0.0237	0.0258	0.0232	10	9	91%	101%
55 - 59	13	595	0.0218	0.0304	0.0273	18	16	72%	80%
60 - 64	12	642	0.0187	0.0349	0.0314	22	20	54%	60%
65 - 69	19	451	0.0421	0.0403	0.0362	18	16	106%	117%
70 - 74	12	274	0.0438	0.0466	0.0420	13	12	93%	104%
75 - 79	9	158	0.0570	0.0660	0.0594	10	9	86%	96%
80 - 84	7	121	0.0579	0.1040	0.0936	12	11	57%	63%
85 - 89	7	45	0.1556	0.1485	0.1337	6	6	109%	121%
90 - 94	6	17	0.3529	0.2020	0.1818	3	3	177%	196%
95 +	3	8	0.3750	0.2730	0.2457	2	2	130%	145%
Totals	100	2,878				120	108	83%	92%

**MALE PRE-RETIREMENT MORTALITY**

Age	Actual Deaths	Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	236	0.0000	0.0011	0.0011	0	0	0%	0%
20-24	4	2,843	0.0014	0.0011	0.0011	3	3	135%	135%
25-29	5	7,939	0.0006	0.0010	0.0010	8	8	63%	63%
30-34	4	10,009	0.0004	0.0009	0.0009	9	9	46%	46%
35-39	30	21,589	0.0014	0.0007	0.0007	16	16	192%	192%
40-44	14	13,899	0.0010	0.0009	0.0009	12	12	114%	114%
45-49	25	15,898	0.0016	0.0012	0.0012	19	19	128%	128%
50-54	26	18,173	0.0014	0.0018	0.0018	33	33	79%	79%
55-59	42	17,471	0.0024	0.0026	0.0026	45	45	94%	94%
60-64	37	10,552	0.0035	0.0036	0.0036	37	37	100%	100%
65-69	26	3,308	0.0079	0.0054	0.0054	17	17	150%	150%
70-74	10	1,058	0.0095	0.0064	0.0064	7	7	148%	148%
75 and over	1	572	0.0017	0.0064	0.0064	4	4	27%	27%
Totals	224	123,547				210	210	107%	107%

**FEMALE PRE-RETIREMENT MORTALITY**

Age		Total Count	Actual Rate	Assumed Rate		Expected Deaths		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	149	0.0000	0.0007	0.0007	0	0	0%	0%
20-24	-	3,725	0.0000	0.0004	0.0006	1	2	0%	0%
25-29	8	14,911	0.0005	0.0001	0.0002	2	3	342%	281%
30-34	7	22,087	0.0003	0.0003	0.0002	6	5	120%	155%
35-39	16	29,884	0.0005	0.0004	0.0004	12	11	134%	149%
40-44	10	32,732	0.0003	0.0004	0.0003	12	12	80%	80%
45-49	15	40,653	0.0004	0.0007	0.0005	29	21	52%	70%
50-54	42	43,868	0.0010	0.0013	0.0010	57	46	74%	92%
55-59	53	38,847	0.0014	0.0020	0.0017	76	65	70%	81%
60-64	43	20,251	0.0021	0.0027	0.0024	53	48	81%	90%
65-69	20	4,775	0.0042	0.0033	0.0031	16	14	129%	139%
70-74	9	1,101	0.0082	0.0036	0.0036	4	4	227%	231%
75 and over	-	471	0.0000	0.0036	0.0036	2	2	0%	0%
Totals	223	253,454				270	233	82%	96%

**MALE DISABILITY EXPERIENCE**

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N\A	0.0001	0.0001	-	-	N\A	N\A
20-24	-	-	N\A	0.0001	0.0001	-	-	N\A	N\A
25-29	-	-	N\A	0.0001	0.0001	-	-	N\A	N\A
30-34	-	687	0.0000	0.0002	0.0002	0	0	0%	0%
35-39	-	3,231	0.0000	0.0009	0.0009	3	3	0%	0%
40-44	9	5,500	0.0016	0.0016	0.0016	9	9	104%	104%
45-49	16	7,960	0.0020	0.0021	0.0021	17	17	95%	95%
50-54	26	10,067	0.0026	0.0025	0.0025	25	25	103%	103%
55-59	25	9,914	0.0025	0.0026	0.0026	25	25	98%	98%
60-64	8	5,765	0.0014	0.0023	0.0023	13	13	60%	60%
65-69	-	1,608	0.0000	0.0012	0.0012	2	2	0%	0%
70-74	-	-	N\A	0.0004	0.0004	-	-	N\A	N\A
75 and over	-	-	N\A	0.0004	0.0004	-	-	N\A	N\A
Totals	84	44,732				95	95	89%	89%



**FEMALE DISABILITY EXPERIENCE**

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate		Expected Disabilities		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N\A	0.0001	0.0001	-	-	N\A	N\A
20-24	-	-	N\A	0.0001	0.0001	-	-	N\A	N\A
25-29	-	41	0.0000	0.0001	0.0001	0	0	0%	0%
30-34	1	1,842	0.0005	0.0005	0.0005	1	1	96%	96%
35-39	1	7,974	0.0001	0.0009	0.0009	7	7	14%	14%
40-44	10	12,946	0.0008	0.0013	0.0013	17	17	57%	57%
45-49	31	20,329	0.0015	0.0017	0.0017	35	35	89%	89%
50-54	41	26,444	0.0016	0.0019	0.0019	51	51	80%	80%
55-59	29	25,591	0.0011	0.0020	0.0020	51	51	57%	57%
60-64	12	12,786	0.0009	0.0019	0.0019	24	24	50%	50%
65-69	-	2,716	0.0000	0.0010	0.0010	3	3	0%	0%
70-74	-	-	N\A	0.0003	0.0003	-	-	N\A	N\A
75 and over	-	-	N\A	0.0003	0.0003	-	-	N\A	N\A
Totals	125	110,669				190	190	66%	66%

**TERMINATION EXPERIENCE**  
**MALE**

Service	Actual Terminations	Total Count	Actual Rate	Proposed Withdrawal Rate	Expected Terminations		Actual/Expected	
					Current	Proposed	Current (2) / (6)	Proposed (2) / (7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0	2,912	6,700	0.4346	0.4340	2,721	2,908	107%	100%
1	4,691	16,659	0.2816	0.2810	4,754	4,681	99%	100%
2	2,324	11,824	0.1965	0.1960	2,339	2,318	99%	100%
3	1,319	9,190	0.1435	0.1430	1,315	1,314	100%	100%
4	883	7,385	0.1196	0.1190	818	879	108%	100%
5	612	6,084	0.1006	0.1000	556	608	110%	101%
6	494	5,373	0.0919	0.0910	428	489	116%	101%
7	359	4,891	0.0734	0.0730	348	357	103%	101%
8	276	4,506	0.0613	0.0610	294	275	94%	100%
9	244	4,225	0.0578	0.0570	262	241	93%	101%
10	204	3,864	0.0528	0.0520	181	201	113%	102%
11	149	3,535	0.0421	0.0420	160	148	93%	100%
12	131	3,240	0.0404	0.0400	139	130	94%	101%
13	102	2,923	0.0349	0.0340	118	99	86%	103%
14	91	2,620	0.0347	0.0340	99	89	92%	102%
15	74	2,357	0.0314	0.0310	84	73	88%	101%
16	48	2,128	0.0226	0.0220	71	47	67%	103%
17	46	1,922	0.0239	0.0230	60	44	76%	104%
18	39	1,662	0.0235	0.0230	49	38	80%	102%
19 & over	116	5,353			133	0	87%	N/A
Totals	15,114	106,441			14,929	14,939	101%	101%

**TERMINATION EXPERIENCE  
FEMALE**

Service	Actual Terminations	Total Count	Actual Rate	Proposed Withdrawal Rate	Expected Terminations		Actual/Expected	
					Current	Proposed	Current (2) / (6)	Proposed (2) / (7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0	1,359	4,324	0.3143	0.3140	1,518	1,358	90%	100%
1	4,824	20,251	0.2382	0.2380	4,958	4,820	97%	100%
2	3,269	18,922	0.1728	0.1720	3,240	3,255	101%	100%
3	2,379	17,589	0.1353	0.1350	2,270	2,375	105%	100%
4	1,741	16,363	0.1064	0.1060	1,728	1,734	101%	100%
5	1,453	14,801	0.0982	0.0980	1,351	1,450	108%	100%
6	1,178	13,647	0.0863	0.0860	1,108	1,174	106%	100%
7	916	12,624	0.0726	0.0720	917	909	100%	101%
8	743	11,765	0.0632	0.0630	759	741	98%	100%
9	622	11,131	0.0559	0.0550	627	612	99%	102%
10	525	10,317	0.0509	0.0500	329	516	160%	102%
11	448	9,458	0.0474	0.0470	292	445	153%	101%
12	366	8,586	0.0426	0.0420	258	361	142%	101%
13	284	7,851	0.0362	0.0360	229	283	124%	100%
14	251	7,005	0.0358	0.0350	199	245	126%	102%
15	206	6,226	0.0331	0.0330	172	205	120%	100%
16	132	5,574	0.0237	0.0230	150	128	88%	103%
17	133	4,904	0.0271	0.0270	129	132	103%	100%
18	87	4,086	0.0213	0.0210	104	86	84%	101%
19 & over	201	11,649			273	0	74%	N/A
Totals	21,117	217,073			20,610	20,828	102%	101%

**RETIREMENT EXPERIENCE**  
**MALE**

Age	Actual Retirements	Total Count	Expected Retirements		Actual/Expected	
			Current	Proposed	Current (2) / (4)	Proposed (2) / (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Under 50	107	501	75	75	142%	142%
50	52	301	54	54	96%	96%
51	59	434	62	62	95%	95%
52	90	566	75	75	120%	120%
53	95	694	79	79	120%	120%
54	129	814	86	86	150%	150%
55	131	935	117	117	112%	112%
56	135	1,007	130	130	104%	104%
57	148	1,100	145	145	102%	102%
58	168	1,164	154	154	109%	109%
59	183	1,191	165	165	111%	111%
60	215	1,159	233	233	92%	92%
61	276	1,022	204	282	135%	98%
62	249	863	321	259	78%	96%
63	169	735	221	205	77%	83%
64	200	653	173	193	115%	104%
65	243	815	329	280	74%	87%
66	140	562	149	149	94%	94%
67	106	430	115	115	93%	93%
68	78	338	90	90	87%	87%
69	56	284	75	75	75%	75%
Total	3,029	15,568	3,052	3,022	99%	100%

**RETIREMENT EXPERIENCE  
FEMALE**

Age	Actual Retirements	Total Count	Expected Retirements		Actual/Expected	
			Current	Proposed	Current (2) / (4)	Proposed (2) / (5)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Under 50	188	1,172	176	176	107%	107%
50	99	649	117	117	85%	85%
51	135	939	147	147	92%	92%
52	167	1,221	173	173	96%	96%
53	186	1,536	198	198	94%	94%
54	282	1,883	224	224	126%	126%
55	341	2,219	305	305	112%	112%
56	372	2,544	391	391	95%	95%
57	416	2,774	468	468	89%	89%
58	433	2,979	552	533	78%	81%
59	595	3,038	603	603	99%	99%
60	519	2,787	592	552	88%	94%
61	687	2,450	707	707	97%	97%
62	523	1,986	765	652	68%	80%
63	397	1,574	417	417	95%	95%
64	379	1,299	376	376	101%	101%
65	452	1,403	565	542	80%	83%
66	244	901	240	240	102%	102%
67	164	649	172	172	95%	95%
68	108	487	129	129	84%	84%
69	106	380	101	101	105%	105%
Total	6,793	34,870	7,416	7,221	92%	94%

**New Mexico ERB  
2012 Experience Study  
Salary Scale - Males & Females Combined (10 Years of Experience)**

Service	Current Salary Scales		Actual Experience (10 Years)			Proposed Salary Scale	
	Total	Step Rate/ Promotional	Total	Above inflation	Steprate/ Promotional	Total	Steprate/ Promotional
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0	13.50%	8.75%	18.26%	15.80%	14.78%	13.00%	8.75%
1	7.75%	3.00%	6.66%	4.19%	3.17%	7.25%	3.00%
2	6.75%	2.00%	6.58%	4.12%	3.10%	6.25%	2.00%
3	6.25%	1.50%	5.62%	3.16%	2.13%	5.75%	1.50%
4	6.00%	1.25%	5.11%	2.64%	1.62%	5.50%	1.25%
5	5.75%	1.00%	4.80%	2.34%	1.31%	5.25%	1.00%
6	5.50%	0.75%	4.65%	2.18%	1.16%	5.00%	0.75%
7	5.25%	0.50%	4.69%	2.23%	1.21%	4.75%	0.50%
8	5.25%	0.50%	4.40%	1.93%	0.91%	4.75%	0.50%
9	5.25%	0.50%	4.16%	1.70%	0.67%	4.75%	0.50%
10+	4.75%	0.00%	3.49%	1.02%	0.00%	4.25%	0.00%
				2012	2010	2008	2006
a. Current Inflation Assumption				3.00%	3.00%	3.00%	3.00%
b. Current Productivity Component				1.75%	2.00%	2.00%	2.00%
c. Actual CPI-U Inflation for 6/30/02 - 6/30/12				2.46%	2.37%	2.99%	2.62%
d. Proposed Inflation Assumption				3.00%	3.00%	3.00%	3.00%
e. Apparent Productivity Component				1.02%	2.00%	2.58%	2.50%
f. Proposed Productivity Component				1.25%	1.75%	2.00%	2.00%

**New Mexico ERB  
2012 Experience Study  
Salary Scale - Males & Females Combined (5 Years of Experience)**

Index	Current Salary Scales		Actual Experience (5 Years)			Proposed Salary Scale	
	Total	Step Rate/ Promotional	Total	Above inflation	Steprate/ Promotional	Total	Steprate/ Promotional
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0	13.50%	8.75%	17.02%	15.07%	14.38%	13.00%	8.75%
1	7.75%	3.00%	5.85%	3.90%	3.21%	7.25%	3.00%
2	6.75%	2.00%	5.97%	4.02%	3.33%	6.25%	2.00%
3	6.25%	1.50%	4.75%	2.80%	2.11%	5.75%	1.50%
4	6.00%	1.25%	4.16%	2.21%	1.51%	5.50%	1.25%
5	5.75%	1.00%	3.95%	2.00%	1.30%	5.25%	1.00%
6	5.50%	0.75%	3.65%	1.70%	1.01%	5.00%	0.75%
7	5.25%	0.50%	3.57%	1.62%	0.92%	4.75%	0.50%
8	5.25%	0.50%	3.18%	1.23%	0.53%	4.75%	0.50%
9	5.25%	0.50%	3.07%	1.12%	0.43%	4.75%	0.50%
10+	4.75%	0.00%	2.64%	0.69%	0.00%	4.25%	0.00%
				2012	2010	2008	2006
a. Current Inflation Assumption				3.00%	3.00%	3.00%	3.00%
b. Current Productivity Component				1.75%	2.00%	2.00%	2.00%
c. Actual CPI-U Inflation for 6/30/07 - 6/30/12				1.95%	2.30%	3.56%	2.65%
d. Proposed Inflation Assumption				3.00%	3.00%	3.00%	3.00%
e. Apparent Productivity Component				0.69%	2.10%	2.58%	2.50%
f. Proposed Productivity Component				1.25%	1.75%	2.00%	2.00%