

**NEW MEXICO EDUCATIONAL RETIREMENT BOARD**  
ACTUARIAL EXPERIENCE STUDY  
AS OF JUNE 30, 2010

April 29, 2011

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

Dear Members of the Board:

**Subject: Results of 2010 Experience Study**

We are pleased to present our report on the results of the 2010 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, 2010.

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.

Sincerely,



J. Christian Conradi, ASA, MAAA, EA  
Senior Consultant



Leslie L. Thompson, FSA, MAAA, EA  
Senior Consultant

## TABLE OF CONTENTS

		<b>Page</b>
	<b>COVER LETTER</b>	
<b>Section I</b>	<b>EXECUTIVE SUMMARY</b> .....	<b>2</b>
<b>Section II</b>	<b>INTRODUCTION</b> .....	<b>7</b>
<b>Section III</b>	<b>ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS</b> .....	<b>10</b>
<b>Section IV</b>	<b>ACTUARIAL IMPACT OF RECOMMENDATIONS</b> .....	<b>29</b>
<b>Section V</b>	<b>SUMMARY OF RECOMMENDATIONS</b> .....	<b>31</b>
<b>Section VI</b>	<b>SUMMARY OF ASSUMPTIONS AND METHODS, INCORPORATING RECOMMENDED ASSUMPTIONS</b> .....	<b>33</b>
<b>Section VII</b>	<b>SUMMARY OF DATA AND EXPERIENCE</b> .....	<b>42</b>

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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, 2010
  
- **Inflation rate**
  - Currently 3.00%
  - Five-year average increase in CPI-U is 2.30%, ten-year average is 2.37%, twenty-year average is 2.62%, thirty or more years averages are greater than 3.00%
  - Component of investment return assumption, COLA assumption, salary increase assumption, and assumed payroll growth rate
  - NEPC inflation assumption is still 3.00%
  - Recommend no change in assumed inflation rate
  
- **Investment return rate**
  - Currently 8.00% ; recommend decreasing to 7.75%
  - Assumed rate is net of administrative and investment expenses
  - Assume these expenses consume 45 basis points of return, based on recent experience; prior assumption was 30 basis points of return
  - 8.00% assumed rate is composed of a 3.00% inflation assumption and an assumed 5.00% net real return (gross return reduced by assumed expenses)
  - Actual net market return of 2.3% for last 10 years and 7.1% for last 16 years
  - Real rate of return in survey group ranges from 4.56% to 6.1%, with a clear leaning toward a lower rate
  - 8% still most common rate for large public retirement systems but trending down
  - A reasonable range for this assumption would include 7.75% and 8.00%
  - Recommend decreasing the net real rate of return assumption to 4.75%
  - Nominal investment return assumption would decrease from 8.00% to 7.75%
  
- **Cost-of-living increases**
  - Current assumption of 2.00%
  - COLAs are deferred to age 65, 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)
  - COLA will be 2.00% unless inflation is below 2.00% or above 4.00%
  - We recommend no change to this assumption

- ***Salary increase rate, including effect of three-tier licensure program***
  - Salary increases are comprised of price inflation, overall “productivity” increases, and longevity/promotional component
  - We assume 3.00% inflation, plus 2.00% across-the-board increases, plus additional service-related increases during first 10 years of service
  - We adjust for minimum salaries under three-tier licensure program
  - Average increase for last ten years of 6.69%
  - Analysis shows the assumed rates are met for the last 10 year period and the last 5 year period except for those members with 10 or more years of service
  - Current assumptions are conservative
  - We recommend no change to these assumptions for members with less than 10 years of service but decrease the rate for members with at least 10 years of service from 5.00% to 4.75%
  
- ***Payroll growth rate***
  - Rate at which total ERB payroll is expected to grow
  - Current assumed payroll growth rate is 3.75%
  - Only affects funding period, 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 five years, payroll grew 3.1% (with no membership growth)
  - Payroll is assumed to increase more slowly than the 5.00% wage inflation assumption, due to the impact of baby boomers retiring in large numbers over the next 10-15 years
  - Open group projections on the current assumptions show that payroll is projected to increase between 3.50% and 4.50% over the next 20-30 years assuming new members are hired with average pay increases between 3.75% to 5.00% each year
  - Recommend no change to the 3.75% payroll growth assumption
  
- ***Post-retirement mortality rates (nondisabled retirees):***
  - Current tables: 1994 Uninsured Pensioner Mortality Table, males set back 3 years and females set back 2 years
  - 1,690 male deaths and 2,162 female deaths during six-year period (excludes beneficiaries and disabled)
  - Expected 1,605 male deaths and 2,067 female deaths
  - A/E ratio (actual to expected deaths) for males is 105%
  - For females, the A/E ratio is 105%
  - A/E ratios in study two years ago were 111% for males, 112% for females
  - We recommend revision to this assumption to use the RP 2000 table and less age setbacks
  - The table is still conservative, with A/E ratios of 114% for males and 109% for females

- ***Disabled mortality rates:***
  - 74 male deaths and 99 female deaths; expected 69 male and 108 female deaths
  - 108% A/E ratio for males, 92% for females, overall ratio is 98%
  - A/E ratios in study two years ago were 106% for males, 101% for females
  - We recommend no change to this assumption
  
- ***Retirement rates:***
  - 2,861 male retirements during six-year period, and 5,927 female retirements (from active employment)
  - These numbers exclude retirements of previously terminated members
  - Average retirement age of 59.38 for males and 59.27 for females
  - To be conservative, generally look for A/E ratios between 85% and 100%
  - Current tables produce overall A/E ratios of 104% for males and 102% for females
  - The A/Es at 25+ years of service are 92% for males and 87% for females
  - The A/Es for members who became eligible for the Rule of 75 are 93% for males and 89% for females
  - The A/Es for members who became eligible at age 65 are 105% for males and 122% for females
  - We recommend increases to the assumed rates of retirements for members at ages 65 to 69 and for members with at least 25 years of service at ages up through age 54
  - For the tier 2 members we recommend changing the retirement rates for members age 68 or higher to match the tier 1 group
  
- ***Termination rates:***
  - A/E ratios at 103% for males and 105% for females
  - Ratios over 100% for this assumption are conservative
  - Both ratios decreased slightly from last experience study
  - We recommend no change to this assumption
  
- ***Disability:***
  - A/E for disability was 99% (males), 81% (females), and 87% (combined)
  - A/E ratios in study two years ago were 111% for males, 89% for females
  - A/E ratios in study four years ago were 81% for males, 94% for females
  - Small number of disabilities, so A/E results can be volatile
  - We recommend no change to this assumption

- ***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:***
  - Active member mortality, percent married, etc.
  - These assumptions are reasonable or conservative
  - We recommend no change to these assumptions
  
- ***Actuarial methods:***
  - Entry Age Normal actuarial cost method still appropriate
  - Most widely used method among public, statewide plans
  - We recommend changing to a traditional entry age normal actuarial method instead of the method based on a hypothetical group of new entrants
  - Actuarial asset method (five-year smoothing) still appropriate; no change recommended
  - We recommend the membership growth assumption used for projections be decreased from 1.5% to 0.75%
  
- ***Summary of recommendations and estimated impact:***
  - Decrease investment return assumption to 7.75%
  - Revisions to post-retirement mortality
  - Changes to retirement rates at ages 65 to 69 and with 25 or more years of service
  - Decrease to salary scale for members with at least 10 years of service from 5.00% to 4.75%
  - Change to individual entry age normal cost funding method
  - Change the population growth assumption to .75% per year (no impact on valuation results)
  - UAAL increases by \$473 million and funded ratio decreases from 65.7% to 63.6%
  - Normal cost rate increases from 12.48% to 14.09%



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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

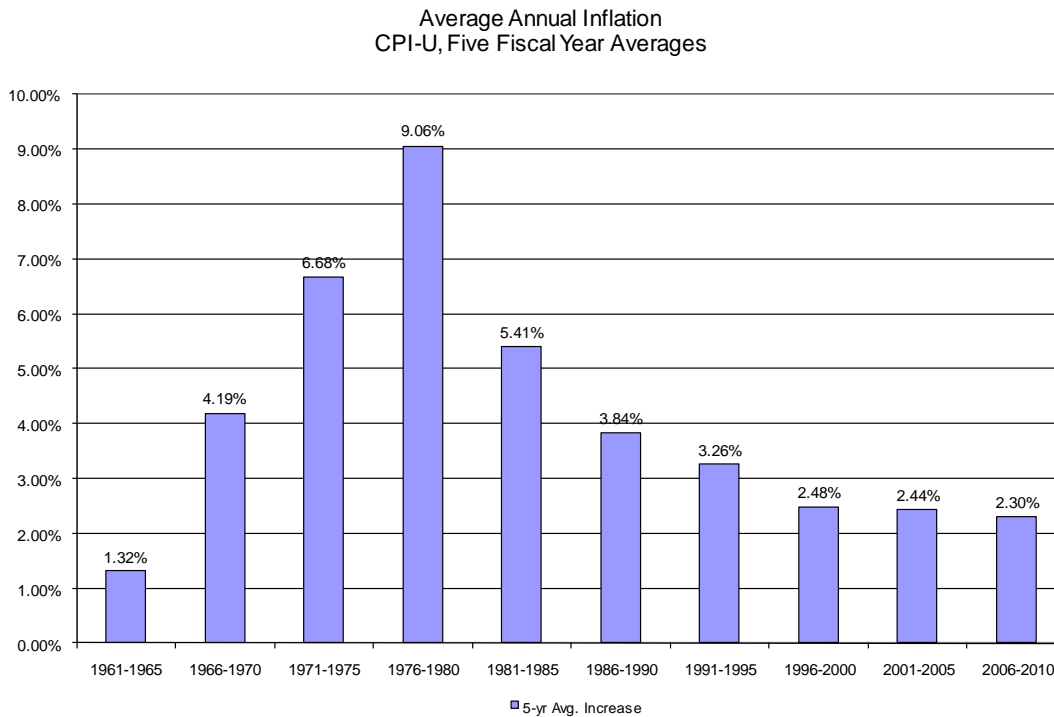
We will begin by discussing the economic assumptions: inflation, the investment return rate, the salary increase assumption, the cost-of-living increases, and the payroll growth rate. Then we will discuss the demographic assumptions: mortality, disability, termination and retirement. Finally we will 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. It impacts investment return, salary increases, and retiree benefit increases. The current annual inflation assumption is 3.00%.

Over the six-year period from June 2004 through June 2010, the CPI-U has increased at an average rate of 2.34%. However, the assumed inflation rate is only weakly tied to past results, and this has been a period of fluctuating inflation. In particular, due to intervention efforts by the Federal Reserve amid the current recession, current inflation statistics decreased considerably through 2010 but have been trending back up in the last few months.

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



The table on the next page shows the average inflation over various periods, ending June 2010:

Periods Ending June 2010	Average Annual Increase in CPI-U
Last five (5) years	2.30%
Last ten (10) years	2.37%
Last fifteen (15) years	2.41%
Last twenty (20) years	2.62%
Last thirty (30) years	3.28%
Since 1913 (first available year)	3.35%

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 30 or more years inflation has averaged slightly above 3.00% per year.

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 2010 or 2011 capital market assumption sets for several investment consulting firms, including: New England Pension Consulting (NEPC, ERB's consultant), Callan, Towers Watson, and Ennis Knupp. The average assumption for inflation was 2.53%, with a range of 2.30% through 3.00%. However, the investment consulting firms typically set their assumptions based on a five or ten year outlook, while actuaries must make much longer projections.

Another source of information about future inflation is the market for US Treasury bonds. For example, the March 17, 2011 yield for a 20-year inflation indexed Treasury bond was 1.47% plus actual inflation. The yield for a 20-year non-indexed US Treasury bond was 4.15%. This means that on that day the bond market was predicting that inflation over the next twenty years would average 2.68% (4.15% – 1.47%) per year. However, this analysis can fluctuate quite a bit over a short period of time. This approach produced a 2.10% predicted inflation using Treasury bond yields on June 30, 2010. The rush to security and liquidity that occurred over the last few years has driven prices for US Treasury bonds up and yields down. This has artificially distorted the results of a comparison between inflation-indexed and standard bonds.

In the Social Security Administration's 2010 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 were unchanged from their prior year's report.

The Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their most recent forecast (fourth quarter of 2010) was for inflation over the next ten years to average 2.20% which is down slightly from their third quarter estimate of 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 100-125 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 3.25%. The current 3.00% assumption is used by about 30% of the surveyed systems, with almost all of the rest using higher assumptions.

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.

## **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. Our 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:

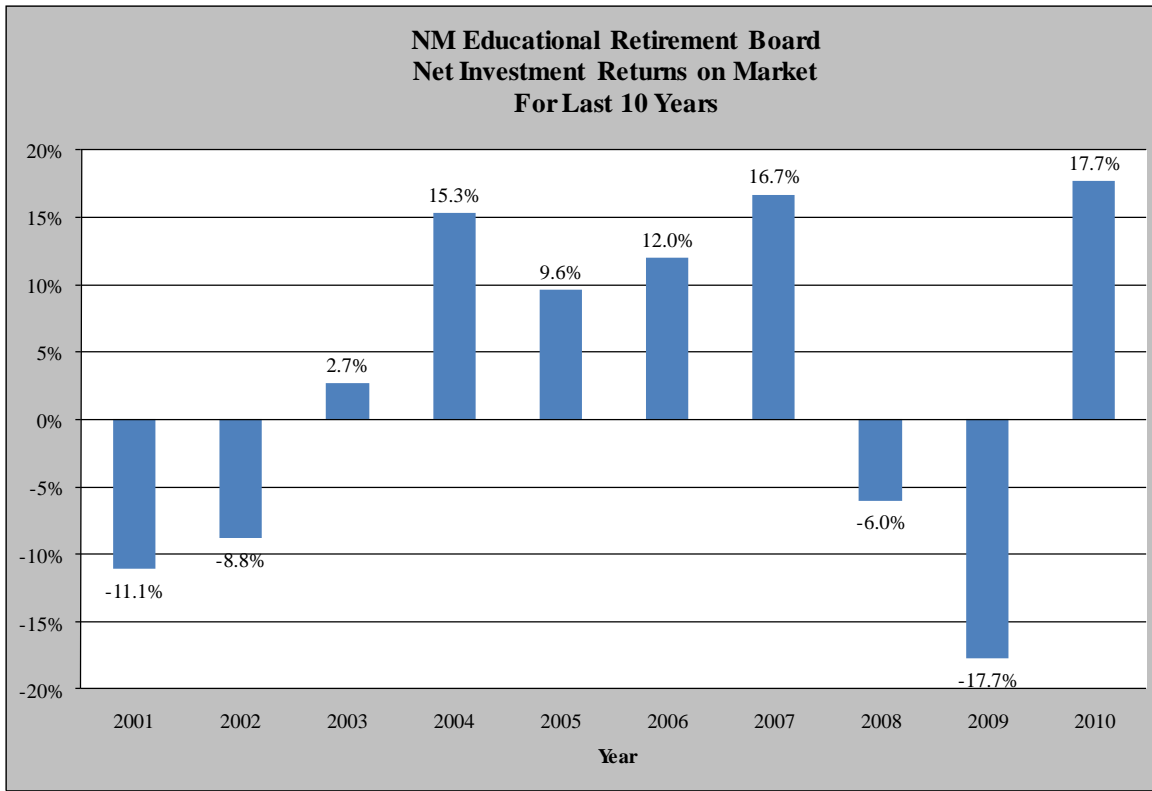
Annual Expenses Expressed as a Percentage Assets			
Fiscal Year	Administrative	Investment	Total
2010	0.16%	0.45%	0.61%
2009	0.10%	0.19%	0.29%
2008	0.06%	0.22%	0.28%
2007	0.07%	0.26%	0.33%
2006	0.07%	0.23%	0.30%
2005	0.08%	0.23%	0.31%
Average	0.09%	0.26%	0.35%

Based on this information, we have assumed that investment and administrative expenses will consume 0.45% (45 basis points) of each year's investment return. (The more recent investment expenses reflect the change to allow investments in additional asset classes, such as private equity.) This assumption is then used in setting the investment return assumption.

### INVESTMENT RETURN RATE

Currently, ERB assumes an investment return rate of 8.00%, net of investment and administrative expenses. 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 5.00%, net of expenses. Since the expense assumption has been 30 basis points, this means that the assumption is that the plan will earn 8.30%. 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 8.00% return assumption in five of the last ten years, the average market return during this period was only 2.28%, which is significantly less than the 8.00% 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 sixteen years, the average return increases to 7.14%.

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 four investment consulting firms: NEPC, Callan, Ennis Knupp, and Towers Watson.

Per information received from NEPC, ERB's current (2008) target asset allocation and the new adopted (2010) target allocations are:

Asset Category	2010 Target Allocation	2008 Target Allocation
Equities – Large Cap US	23%	23%
Equities – Small Cap US	2%	2%
Equities – International (EAFE)	5%	10%
Equities – Emerging Markets	10%	10%
Private Equity	7%	10%
Hedge Funds/Absolute Returns	8%	10%
Other Global Investments	5%	5%
Fixed Income	5%	15%
Debt – Emerging Markets	2%	0%
Opportunistic Credit	20%	5%
Commodities	7%	5%
REITS	5%	5%
Cash Equivalents	1%	0%
Total	100%	100%

The target asset allocation has changed since 2008. There has been a shift in allocation from traditional fixed income to an alternative asset class designed to provide a targeted real return above inflation (opportunistic credit).

The modeling results are shown in the table below:

Investment Consultant	Expected Gross Return	Consultant's Assumed Inflation	Expected Real Return [(2)-(3)]	Assumed Offset for Expenses	Expected Net Real Return [(4)-(5)]
(1)	(2)	(3)	(4)	(5)	(6)
Consultant 1	7.76%	2.40%	5.36%	0.45%	4.91%
Consultant 2	8.85%	2.30%	6.55%	0.45%	6.10%
Consultant 3	7.92%	2.50%	5.42%	0.45%	4.97%
Consultant 4	8.01%	3.00%	5.01%	0.45%	4.56%
Average	8.13%	2.55%	5.58%	0.45%	5.13%

Therefore, one of the assumption sets supports a 5.00% net real return, two sets support a real return just below 5.00% and one is well below 5.00%. The average of the four is a bit above 5.00% but is 28 basis points below the sample average calculated two years ago. In particular, one assumption set results in an average considerably higher than the others. The average of the other three sets is 4.81%. Therefore, we recommend a change in this assumption from 8.00% to 7.75%,

composed of 3.00% inflation, and an assumed gross real return of 5.20% offset by 0.45% in expected investment and administrative expenses.

Reducing the investment return assumption would increase plan liabilities and may require additional contributions. This would, however, also increase the probability that the actual investment return will exceed the assumed rate of return, and it would decrease the size of the investment losses that are incurred when the actual investment returns are less than assumed.

The median investment return assumption used by large public pension plans, per the Public Funds Survey is 8.00%. However, several large plans have recently reduced their assumption, and several others are currently reviewing this assumption. A comparison of this survey with the one two year's prior shows significant movement towards lower return assumptions.

An additional issue creating a need to reduce the assumed rate of return is that of additional risk. The greater the volatility in the assets, the lower the compound rate of return. For example, assume a four year period where the earnings are 8% per year. The compounded rate of return is 8%. Next, assume a four year period of returns of 4%, 12%, 4%, and 12%. The compounded rate of return is 7.9%.

Thus, due to lower expected real returns, higher expense and high volatility, we recommend a decrease from 8.00% to 7.75%.

ERB provides automatic post-retirement increases to retired members after they reach age 65. Currently, increases are assumed to be 2.00% per year. Some members in a grandfathered group receive an increase before age 65, also assumed to be 2.00%.

The amount of the increase depends on the increase in the CPI-U index, but in most cases it is 50% of the CPI-U increase, not more than 4.00%, and not less than the smaller of 2.00% and 100% of the CPI-U index. When inflation is anywhere between 2.00% and 4.00%, the ERB benefit increase will be 2.00%. We recommend leaving this assumption unchanged.

## **SALARY INCREASE RATES AND THREE-TIER LICENSURE SYSTEM**

The current salary increase rates assumed for the valuation vary by service. They range from 13.50% for new members to 5.00% for members with 10 or more years of service.

The average pay increases for members active in both valuations for the last eight years, with at least 1.00 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	2.63%

The geometric average of these is 6.01%.

In 2003, New Mexico adopted a new three-tier licensure system for its classroom teachers. This program provided minimum salaries for the teachers achieving certain criteria.

Because of the three-tier licensure program, we could not effectively analyze salary increases in the 2006 and 2008 experience studies using standard approaches. For this experience study we have looked at the historical pay increases and found that the salary increases did generally meet or exceed the assumed increase amounts except for members with 10 or more years of service.

Over both a five and a ten year period, the salary increases either met or exceeded the assumed rates. As of the last valuation, salary increases were less than the assumed rates. Based on these findings we recommend no change to the assumed salary increase rates for members with less than 10 years of service and a decrease from 5.00% to 4.75% for members with 10 or more years of service.

Using a minimum 4.75% salary increase for all members—call this the wage inflation rate—is at the conservative end of a reasonable range, compared to most other teacher retirement systems. (For most of our other teacher retirement systems, we assume a wage inflation rate of 4.25% to 4.75%.) Given the large increases granted by the legislature in recent years, though, this is still a reasonable assumption for ERB.

## **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 charge 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.

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

Fiscal Year	Membership Growth	Payroll Growth	Adjusted Payroll Growth
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%
2006	-2.42%	0.47%	2.96%
2005	0.73%	3.13%	2.38%
Average	0.10%	3.12%	3.01%

Over the last six years, payroll growth has averaged 3.1%, down from the 4.2% measured in the last experience study, and it has averaged 3.7% over the last ten years.

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, despite the fact that ERB has been experiencing growth in membership (at an average of 0.5% over the last ten years), 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 growth has averaged 3.0%.

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 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 no change to the payroll growth rate of 3.75%. This has no impact on the liabilities of ERB, but it does impact the amortization period, since we assume there will be more future contributions (3.75% more per year) 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 1994 Uninsured Pensioner Mortality Table. The table has separate rates for males and females. The rates are then adjusted by using a three-year setback for males and a two-year setback for 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 three years, the actuary uses the table's rate for an age three years younger than the person actually is. For example, the mortality

rate used for a 60-year old male retiree is the rate in the 1994 Group Annuity Mortality Table for males at age 57.)

There were 1,690 deaths among the male retirees and 2,162 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 1,605 and 2,067 deaths respectively. This produced A/E ratios of 105% for males and 105% for females. This is still a reasonably good match overall (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. Last year, the A/E ratios were 111% for males, 112% for females and 111% overall.

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	5	133%	4	193%
55-59	33	27	123%	18	180%
60-64	65	72	90%	51	128%
65-69	135	162	84%	121	112%
70-74	203	240	85%	182	112%
75-79	300	311	96%	270	111%
80-84	364	331	110%	323	113%
85-89	327	264	124%	286	114%
90-94	182	140	130%	165	110%
95-99	69	49	142%	55	126%
100-104	5	5	108%	5	105%
Other	0	0	0%	0	0%
Totals	1,690	1,605	105%	1,479	114%

\* 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	9	6	158%	5	178%
55-59	38	27	138%	28	138%
60-64	81	83	97%	79	102%
65-69	173	190	91%	173	100%
70-74	214	244	88%	235	91%
75-79	262	306	86%	299	88%
80-84	340	355	96%	339	100%
85-89	464	380	122%	371	125%
90-94	371	309	120%	301	123%
95-99	165	140	118%	127	130%
100-104	41	25	165%	19	211%
Other	4	1	440%	1	588%
Totals	2,162	2,067	105%	1,976	109%

\* 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 table is becoming a little dated and modeling further improvements in life expectancies would require increasing the setback on the tables. Instead, we recommend changing to a more modern mortality table, the RP-2000 tables published by the Society of Actuaries, with a white collar adjustment and projected to the year 2010, with a 90% multiplier and one year age setback for both males and females. This will still provide a good fit to the recent experience and allow for margins of about 10% to 15% for future mortality improvements.

## DISABLED MORTALITY RATES

This is a minor assumption, and it has little impact on the liabilities of ERB. There were 74 male deaths and 99 female deaths among the disabled retirees during the six-year study period. This produced A/E ratios of 108% and 92% respectively. At the time of the last experience study, the A/E ratios were 106% for males, 101% for females and 103% overall. Due to the small sample size as well as the reasonable A/E ratios, we recommend no change to this assumption. The results of this analysis are shown below:

<b>Disability Mortality – Males</b>			
Age	Actual deaths	Expected deaths	A/E ratio
45-49	3	2	131%
50-54	7	5	129%
55-59	8	10	81%
60-64	15	10	157%
65-69	8	8	94%
70-74	7	8	89%
75-79	12	6	186%
80-84	4	7	58%
85-89	6	6	106%
90-94	4	4	91%
Other	0	1	0%
Totals	74	69	108%

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



<b>Disability Mortality – Females</b>			
Age	Actual deaths	Expected deaths	A/E ratio*
40-44	2	1	227%
45-49	3	3	91%
50-54	8	9	85%
55-59	14	17	84%
60-64	11	19	57%
65-69	17	15	110%
70-74	10	10	104%
75-79	10	10	103%
80-84	6	10	60%
85-89	7	6	124%
90-94	6	5	116%
Other	5	3	174%
Totals	99	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 mortality table is used for active members. The results of this analysis are shown below:

Active mortality rates	Males	Females	Total
Number of actual deaths	238	240	478
Number of expected deaths	199	265	464
A/E ratio	120%	91%	103%

The number of actual deaths is considerably higher than that reported by ERB for the six-year period. ERB has reported very few deaths each year so we augmented the data by performing a check against the Social Security Administration (SSA) database for additional deaths. Since the A/E ratio is close to 100% and since we suspect that there may be a reporting discrepancy with the date of death reported by the SSA, we recommend that we make no change to the current assumed mortality rates for active members.

## DISABILITY RATES

Disability is also an assumption with a minor impact on liabilities. The A/E ratio was 99% for males and 81% for females, and on a combined basis it was 87%. This is a reasonable match, given the small numbers of disabled lives. (In the previous experience study the A/E ratios were 111% for males, 89% for females and 96% overall). The results of this analysis are shown below:

Active disability rates	Males	Females	Total
Number of actual disabilities	94	149	243
Number of expected disabilities	95	185	280
A/E ratio	99%	81%	87%

The overall A/E has remained relatively stable for the last two studies (90% overall in the 2006 study) suggesting that disability experience is not changing, although the female A/E ratio has trended down slightly for the last two studies. Therefore, we recommend leaving this assumption unchanged this year but would recommend changing the female assumption if the A/E trends down again in two years.

## RETIREMENT RATES

We currently use retirement rates that vary by age, service, and sex. There were 2,861 male retirements during the six-year period, and there were 5,927 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 104% for males and 102% for females. (Rates less than 100% are conservative.) In the last study, the A/E was 103% 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 92% for males and 87% for females. The A/E's for members who met the Rule of 75 (with at least age 60) are 93% for males and 89% 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 105% for males and 122% for females. Additionally, the average retirement age for males is 59.38 (actual) vs. 59.58 (expected). For females, these ages are 59.27 (actual) and 58.96 (expected). In the last experience study, the actual ages at retirement were 58.87 (males) and 58.89 (females).

We believe there is a reasonably good match between experience and the assumptions, and we recommend leaving the current assumptions unchanged for members who meet the eligibility to retire under the Rule of 75. However, we recommend increasing the retirement rates slightly for both male and female members who retire under the age 65 eligibility requirement and for members with at least 25 years of service. Under the recommended assumption, the overall A/E for females would change from 102% to 101% and the A/E for males would remain unchanged 104%. The results of this analysis are shown on the next page.

Note that the results include A/E ratios for members with 30 or more years of service. Currently, members 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. Under HB 573, all members who are hired on or after July 1, 2010 are subject to a retirement eligibility for an unreduced benefit of age 67 with 5 years of service, Rule of 80 (with at least age 60), or 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 results. Therefore, we recommend only minor changes to the Tier 2 retirement rates for members over age 67. New relevant data for analyzing this assumption will not be available for several years.

<b>AE's – MALES (Current Assumption)</b>							
	<b>0-4</b>	<b>5-9</b>	<b>10-14</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>30+</b>
<b>45-49</b>	0%	0%	0%	0%	0%	89%	56%
<b>50-54</b>	0%	0%	0%	0%	0%	95%	105%
<b>55-59</b>	0%	0%	0%	0%	0%	96%	107%
<b>60-64</b>	0%	0%	147%	90%	98%	83%	85%
<b>65+</b>	0%	141%	102%	89%	70%	87%	67%
<b>AE's – FEMALES (Current Assumption)</b>							
	<b>0-4</b>	<b>5-9</b>	<b>10-14</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>30+</b>
<b>45-49</b>	0%	0%	0%	0%	0%	73%	76%
<b>50-54</b>	0%	0%	0%	0%	0%	84%	82%
<b>55-59</b>	0%	0%	0%	0%	0%	85%	92%
<b>60-64</b>	0%	0%	109%	90%	100%	88%	81%
<b>65+</b>	0%	112%	113%	135%	139%	133%	135%
<b>AE's – MALES (Proposed Assumption)</b>							
	<b>0-4</b>	<b>5-9</b>	<b>10-14</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>30+</b>
<b>45-49</b>	0%	0%	0%	0%	0%	118%	74%
<b>50-54</b>	0%	0%	0%	0%	0%	106%	116%
<b>55-59</b>	0%	0%	0%	0%	0%	96%	107%
<b>60-64</b>	0%	0%	147%	90%	98%	83%	85%
<b>65+</b>	0%	96%	86%	89%	70%	87%	67%
<b>AE's – FEMALES (Proposed Assumption)</b>							
	<b>0-4</b>	<b>5-9</b>	<b>10-14</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>30+</b>
<b>45-49</b>	0%	0%	0%	0%	0%	97%	101%
<b>50-54</b>	0%	0%	0%	0%	0%	96%	96%
<b>55-59</b>	0%	0%	0%	0%	0%	85%	92%
<b>60-64</b>	0%	0%	109%	90%	100%	88%	81%
<b>65+</b>	0%	93%	89%	107%	95%	91%	90%

**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, and we want to continue this practice.

In the aggregate, the current assumptions produce an A/E ratio for males of 103% and an A/E ratio for females of 105%. For this assumption, A/E ratios over 100% are conservative. This is a reasonably good match, and we do not recommend making a change at this time. The results are shown below:

<b>Termination Rates – Males</b>			
Service Years	Actual terms	Expected terms	A/E ratio
0-4	11,275	10,932	103%
5-9	2,001	1,862	107%
10 or more	1,003	1,055	95%
Totals	14,279	13,850	103%
Vested (5 or more years)	3,004	2,918	103%

<b>Termination Rates – Females</b>			
Service Years	Actual terms	Expected terms	A/E ratio
0-4	16,603	16,168	103%
5-9	4,922	4,698	105%
10 or more	2,640	2,050	129%
Totals	24,165	22,916	105%
Vested (5 or more years)	7,562	6,748	112%

## **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, the likelihood that a terminating employee will take a refund, etc. 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

Currently, the plan employs an aggregate variant of EAN that differs from traditional individual EAN in two ways. First, rather than being basing the normal cost on the actual individuals in the active population, it is based on a hypothetical group representative of recent new entrants. Second, it uses the benefit structure for future new hires. I.e., we use the benefit structure applicable to Tier 2 members hired after June 30, 2010 to determine the normal cost. This produces a theoretically level pattern of costs if experience tracks the assumptions.

The other variation of EAN uses the provisions applicable to each individual member to determine the normal cost. Under this method, if benefits are reduced for future hires, there is no immediate savings. Instead, contribution rates would decrease slowly as more of the members are covered by the new provisions in the future. It would take a generation of new employees before the savings from the benefit reduction would be fully recognized.

The EAN variation that we use has been subject to some criticism recently because it allows recognition of savings before members are covered by the new provisions. Some observers, including Buck Consultants in their recent actuarial audit, have claimed that the method is not compliant with current GASB standards for an allowable funding method. We disagree with the criticisms; we believe the method does comply with current GASB standards, and we continue to use the method on a large number of governmental retirement systems. However, we have recently learned that GASB, which is currently preparing a new standard to replace Statement No. 25, has tentatively decided not to permit the method under the new standard.

Therefore, we recommend that the actuarial cost method be changed to the traditional individual entry age normal cost method. This method will base the normal cost calculation on the individual members currently in the valuation and not on the hypothetical group of new entrants. It will also base the normal cost for each individual member on the benefit provisions that apply to that individual. For instance, as of the June 30, 2010 actuarial valuation that means the normal cost would have been based on the Tier 1 benefits and eligibilities that all the current members are covered by and would not have used the Tier 2 benefit structure at all.

Based on the June 30, 2010 actuarial valuation and the assumptions used for that valuation, this would have resulted in a higher normal cost and lower actuarial accrued liability. The impact to the annual required contribution is not expected to be significant. However, the Board should keep in mind that this change means that, if another round of benefit reductions is made for future hires only, there will be no immediate impact on the plan's normal cost, UAAL, funded ratio, or ARC. Reductions in cost will occur only as members subject to the new provisions are hired. Any savings effect will necessarily be small in the first few years after enactment of the change.

### **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. These projections assume the active membership in the plan will grow 1.50% per year over the projection period. However, over the last six years, the membership has grown 0.1% per year, over the last ten years it has grown 0.5% per year, and over the last 20 years it has grown 1.3% per year. (See the payroll growth assumption discussion on page 19 for additional detail regarding recent membership growth.) Although the last couple of years have been impacted by the recent recession and budget constraints that may have affected hiring decisions, the 1.5% growth assumption is probably still too aggressive going forward for a mature plan like ERB. Therefore, we recommend decreasing this assumption to 0.75%. This assumption will affect the calculation of the annual required contribution in the projections since fewer members will be assumed to enter the plan and less payroll will be available to amortize the unfunded accrued liability. However, this assumption has no impact on the annual valuations since the valuation is a snapshot based only on the current group of members.

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## **SECTION IV**

### ACTUARIAL IMPACT OF RECOMMENDATIONS

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## Actuarial Impact of Recommendations

The annual contribution rate 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.

Contribution rates and liabilities are computed using the Entry Age actuarial cost method. The employer contribution rate is the sum of two pieces: the employer normal cost rate and the amortization rate. The normal cost rate is determined as a percent of pay. The employer normal cost is the difference between this 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 a 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, it should increase over time, until it reaches 100%.

The proposed assumptions increase the employer contribution rate from 13.39% (current assumptions) to 15.70% (proposed assumptions)



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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:

- Decrease investment return assumption to 7.75%
- Revisions to post-retirement mortality
- Changes to retirement rates at ages 65 to 69 and with 25 or more years of service
- Decrease to salary increases for members with 10 or more years of service
- Change the funding method to traditional individual entry age normal
- Decrease the membership growth assumption for projections to 0.75%.

We recommend that the Board formally accept this report and adopt the proposed assumptions for the June 30, 2011 and June 30, 2012 actuarial valuations.

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## **SECTION VI**

SUMMARY OF ASSUMPTIONS  
AND METHODS INCORPORATING  
THE RECOMMENDED ASSUMPTIONS

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## 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 Entry Age Normal actuarial cost method.

The 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 cost is the level (as a percentage of pay) contribution required to fund the benefits for a new member. This is determined based upon a hypothetical group of new entrants. This group is based on the age-pay-sex distribution of new members joining ERB during the five-year period ending June 30, 2004. Part of the normal cost is paid from the employees' own contributions. The local employers pay the balance from their contributions.

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 1.75% plus step-rate/promotional as shown:

Years of Service	Annual Step-Rate/Promotional Component Rates of Increase	Total Annual Rate of Increase
0	8.75%	13.50%
1	3.00%	7.75%
2	2.00%	6.75%
3	1.50%	6.25%
4	1.25%	6.00%
5	1.00%	5.75%
6	0.75%	5.50%
7	0.50%	5.25%
8	0.50%	5.25%
9	0.50%	5.25%
10 or more	0.00%	4.75%

3. Three-Tier Licensure Increased: In 2003, the legislature adopted a new framework for classroom teacher salaries with minimum salaries mandated for certain classes of teachers beginning in FY 2004. For teachers who met the mandated minimum salary of \$30,000 in FY 2004, their salaries were assumed to meet the mandated minimum of \$35,000 in FY 2005 and \$40,000 in FY 2006 and later years for “professional” teachers if they had at least three years of service at each respective valuation date. Likewise, for teachers who met the mandated minimum salary of \$30,000 in FY 2004, their salaries were assumed to meet the mandated minimum of \$45,000 in FY 2007 and \$50,000 in FY 2008 and later years for “master” teachers if they had at least six years of service at each respective valuation date.

4. Cost-of-living increases:
  - a. All retirees and beneficiaries - 2% per year increase, beginning in the year the member reaches age 65, or the third year following retirement for disabled retirees.
  - b. Members retired prior to July 1, 1984 - 2% per year until they reach age 65
5. Payroll growth:
 

3.75% per year (with no allowance for membership growth)
6. Contribution accumulation: Member contributions are assumed to have grown at 5.50% per year, with 6.00% interest, compounded annually.

**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, set back one year, projected to 2010
  - b. Healthy females - 90% of RP-2000 Combined Mortality Table with White Collar Adjustment for females, set back one year, projected to 2010
  - c. Disabled males and females - 1981 Disability Table

See sample rates below:

Age	Deaths per 100 Lives		
	Healthy Males	Healthy Females	Disabled Males and Females
40	.07	.05	1.76
45	.10	.07	2.08
50	.14	.11	2.42
55	.22	.19	2.83
60	.38	.36	3.29
65	.76	.66	3.76
70	1.34	1.16	4.36
75	2.32	1.95	5.62
80	4.28	3.25	8.84
85	7.87	5.57	12.95

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

Age	Deaths per 100 Members	
	Males	Females
25	.10	.02
30	.10	.02
35	.08	.04
40	.08	.03
45	.11	.05
50	.15	.10
55	.23	.17
60	.31	.24
65	.46	.31

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 – Current Members**

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	40.00	40.00	35.00	35.00
65	0.00	30.00	45.00	45.00	45.00	45.00
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	30.00
62	0.00	0.00	50.00	35.00	35.00	40.00
65	0.00	35.00	40.00	40.00	45.00	45.00
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**

Age	Males - Years of Service						
	0-4	5-9	10-14	15-19	20-24	25-29	30+
45	0.00	0.00	0.00	0.00	0.00	0.00	N/A
50	0.00	0.00	0.00	0.00	0.00	0.00	30.00
55	0.00	0.00	0.00	0.00	5.00	5.00	40.00
60	0.00	0.00	0.00	15.00	20.00	25.00	40.00
62	0.00	0.00	40.00	40.00	35.00	35.00	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+
45	0.00	0.00	0.00	0.00	0.00	0.00	N/A
50	0.00	0.00	0.00	0.00	0.00	0.00	30.00
55	0.00	0.00	0.00	0.00	6.00	6.00	43.00
60	0.00	0.00	0.00	20.00	15.00	30.00	45.00
62	0.00	0.00	50.00	35.00	35.00	40.00	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) - Select and ultimate as shown below for selected ages:

Terminations per 100 Members

Males

Years of Service

Age	0	1	2	3	4	5	6	7	8	9	10+
25	45.10	33.50	23.39	17.10	13.75	11.68	10.21	8.94	7.79	7.10	8.86
30	42.28	28.78	20.12	14.85	11.95	10.34	9.17	8.08	7.04	6.28	5.99
35	40.37	26.82	18.43	13.40	10.65	9.29	8.37	7.48	6.58	5.80	3.84
40	39.28	26.65	17.89	12.64	9.85	8.56	7.82	7.13	6.38	5.65	2.40
45	38.59	26.98	18.04	12.55	9.58	8.20	7.49	6.94	6.37	5.79	1.81
50	37.83	27.06	18.60	13.10	9.90	8.24	7.35	6.83	6.45	6.13	2.50
55	36.87	26.97	19.58	14.29	10.83	8.70	7.43	6.77	6.54	6.59	5.30
60	35.79	27.22	21.09	16.11	12.36	9.58	7.69	6.74	6.57	7.11	10.67
65	34.67	28.18	23.21	18.55	14.47	0.00	0.00	0.00	0.00	0.00	0.00

Females

Years of Service

Age	0	1	2	3	4	5	6	7	8	9	10+
25	40.50	29.30	21.62	17.88	16.08	14.90	13.60	11.81	9.39	6.66	7.55
30	36.06	25.45	18.97	15.08	12.93	11.68	10.69	9.58	8.12	6.36	5.47
35	33.25	23.24	16.75	12.79	10.57	9.37	8.62	7.94	7.11	6.03	3.87
40	31.79	22.00	15.10	11.14	9.05	7.99	7.34	6.86	6.35	5.66	2.76
45	31.29	21.37	14.28	10.40	8.46	7.48	6.83	6.32	5.87	5.32	2.20
50	31.49	21.39	14.49	10.65	8.71	7.71	6.96	6.32	5.74	5.18	2.27
55	32.32	22.32	15.72	11.79	9.67	8.47	7.57	6.76	6.02	5.39	3.10
60	33.76	24.34	17.95	13.71	11.24	9.62	8.51	7.54	6.72	6.07	4.95
65	35.82	27.54	21.14	16.33	13.36	0.00	0.00	0.00	0.00	0.00	0.00

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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## List of Tables

Post-retirement mortality experience for non-disabled male retirees.....	42
Post-retirement mortality experience for non-disabled female retirees .....	43
Post-retirement mortality experience for disabled male retirees .....	44
Post-retirement mortality experience for disabled female retirees .....	45
Pre-retirement mortality experience for male employees.....	46
Pre-retirement mortality experience for female employees .....	47
Disability experience for male employees .....	48
Disability experience for female employees .....	49
Termination experience for male employees.....	50
Termination experience for female employees.....	51
Retirement experience for male employees.....	52
Retirement experience for female employees.....	53
Salary experience for employees (10 years of experience) .....	54
Salary experience for employees (5 years of experience).....	55

**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	1,957	0.0036	0.0025	0.0017	5	4	133%	193%
55-59	33	5,998	0.0055	0.0043	0.0028	27	18	123%	180%
60-64	65	9,243	0.0070	0.0076	0.0049	72	51	90%	128%
65-69	135	11,534	0.0117	0.0139	0.0099	162	121	84%	112%
70-74	203	10,281	0.0197	0.0234	0.0166	240	182	85%	112%
75-79	300	8,552	0.0351	0.0366	0.0295	311	270	96%	111%
80-84	364	5,592	0.0651	0.0601	0.0549	331	323	110%	113%
85-89	327	2,824	0.1158	0.0964	0.0980	264	286	124%	114%
90-94	182	973	0.1871	0.1499	0.1686	140	165	130%	110%
95-99	69	223	0.3094	0.2319	0.2505	49	55	142%	126%
100-104	5	15	0.3333	0.3240	0.3228	5	5	108%	105%
Other	0	0	N\A	0.4189	0.3600	0	0	0%	0%
Totals	1,690	57,192				1,605	1,479	105%	114%

**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	9	3,481	0.0026	0.0015	0.0014	6	5	158%	178%
55-59	38	10,542	0.0036	0.0025	0.0025	27	28	138%	138%
60-64	81	16,955	0.0048	0.0048	0.0045	83	79	97%	102%
65-69	173	20,568	0.0084	0.0093	0.0084	190	173	91%	100%
70-74	214	16,456	0.0130	0.0148	0.0143	244	235	88%	91%
75-79	262	12,578	0.0208	0.0244	0.0237	306	299	86%	88%
80-84	340	8,443	0.0403	0.0424	0.0402	355	339	96%	100%
85-89	464	5,321	0.0872	0.0728	0.0709	380	371	122%	125%
90-94	371	2,563	0.1448	0.1250	0.1210	309	301	120%	123%
95-99	165	738	0.2236	0.2002	0.1812	140	127	118%	130%
100-104	41	92	0.4457	0.2972	0.2204	25	19	165%	211%
Other	4	440	0.0068	0.0000	0.0000	1	1	440%	588%
<b>Totals</b>	<b>2,162</b>	<b>98,177</b>				<b>2,067</b>	<b>1,976</b>	<b>105%</b>	<b>109%</b>

**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	101	0.0297	0.0222	0.0222	2	2	131%	131%
50 - 54	7	210	0.0333	0.0258	0.0258	5	5	129%	129%
55 - 59	8	325	0.0246	0.0304	0.0304	10	10	81%	81%
60 - 64	15	276	0.0543	0.0349	0.0349	10	10	157%	157%
65 - 69	8	212	0.0377	0.0403	0.0403	8	8	94%	94%
70 - 74	7	166	0.0422	0.0466	0.0466	8	8	89%	89%
75 - 79	12	100	0.1200	0.0660	0.0660	6	6	186%	186%
80 - 84	4	67	0.0597	0.1040	0.1040	7	7	58%	58%
85 - 89	6	39	0.1538	0.1485	0.1485	6	6	106%	106%
90 - 94	4	22	0.1818	0.2020	0.2020	4	4	91%	91%
95 +	0	5	0.0000	0.2730	0.2730	1	1	0%	0%
<b>Totals</b>	<b>74</b>	<b>1,553</b>				<b>69</b>	<b>69</b>	<b>108%</b>	<b>108%</b>

**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	2	46	0.0435	0.0187	0.0187	1	1	227%	227%
45 - 49	3	146	0.0205	0.0222	0.0222	3	3	91%	91%
50 - 54	8	363	0.0220	0.0258	0.0258	9	9	85%	85%
55 - 59	14	546	0.0256	0.0304	0.0304	17	17	84%	84%
60 - 64	11	549	0.0200	0.0349	0.0349	19	19	57%	57%
65 - 69	17	387	0.0439	0.0403	0.0403	15	15	110%	110%
70 - 74	10	204	0.0490	0.0466	0.0466	10	10	104%	104%
75 - 79	10	146	0.0685	0.0660	0.0660	10	10	103%	103%
80 - 84	6	98	0.0612	0.1040	0.1040	10	10	60%	60%
85 - 89	7	39	0.1795	0.1485	0.1485	6	6	124%	124%
90 - 94	6	26	0.2308	0.2020	0.2020	5	5	116%	116%
95 +	5	11	0.4545	0.2730	0.2730	3	3	174%	174%
Totals	99	2,561				108	108	92%	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	-	247	0.0000	0.0011	0.0003	0	0	0%	0%
20-24	5	2,831	0.0018	0.0011	0.0004	3	3	169%	169%
25-29	4	7,310	0.0005	0.0010	0.0004	7	7	55%	55%
30-34	6	9,686	0.0006	0.0009	0.0006	8	8	71%	71%
35-39	23	18,569	0.0012	0.0007	0.0009	13	13	170%	170%
40-44	15	13,759	0.0011	0.0009	0.0012	12	12	123%	123%
45-49	26	16,561	0.0016	0.0012	0.0017	20	20	128%	128%
50-54	33	18,714	0.0018	0.0018	0.0024	34	34	97%	97%
55-59	48	17,015	0.0028	0.0026	0.0036	44	44	110%	110%
60-64	39	9,282	0.0042	0.0036	0.0059	33	33	119%	119%
65-69	25	2,919	0.0086	0.0054	0.0086	15	15	164%	164%
70-74	11	1,007	0.0109	0.0064	0.0000	6	6	171%	171%
75 and over	3	339	0.0088	0.0064	0.0000	2	2	138%	138%
Totals	238	118,239				199	199	119%	119%

**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	-	183	0.0000	0.0007	0.0002	0	0	0%	0%
20-24	1	4,480	0.0002	0.0004	0.0002	1	1	72%	72%
25-29	10	16,218	0.0006	0.0001	0.0002	3	3	391%	391%
30-34	7	23,296	0.0003	0.0003	0.0003	6	6	114%	114%
35-39	14	31,354	0.0004	0.0004	0.0006	13	13	112%	112%
40-44	14	34,603	0.0004	0.0004	0.0009	13	13	106%	106%
45-49	25	43,360	0.0006	0.0007	0.0013	31	31	82%	82%
50-54	45	45,588	0.0010	0.0013	0.0020	59	59	76%	76%
55-59	59	37,879	0.0016	0.0020	0.0030	74	74	80%	80%
60-64	35	17,551	0.0020	0.0027	0.0047	46	46	76%	76%
65-69	19	4,179	0.0045	0.0033	0.0066	14	14	140%	140%
70-74	10	989	0.0101	0.0036	0.0000	4	4	281%	281%
75 and over	1	371	0.0027	0.0036	0.0000	1	1	75%	75%
Totals	240	260,051				265	265	91%	91%

**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	-	626	0.0000	0.0002	0.0002	0	0	0%	0%
35-39	2	3,189	0.0006	0.0009	0.0009	3	3	67%	67%
40-44	12	5,509	0.0022	0.0016	0.0016	9	9	137%	137%
45-49	19	8,510	0.0022	0.0021	0.0021	18	18	106%	106%
50-54	24	10,493	0.0023	0.0025	0.0025	26	26	91%	91%
55-59	33	9,741	0.0034	0.0026	0.0026	25	25	132%	132%
60-64	4	5,128	0.0008	0.0023	0.0023	12	12	34%	34%
65-69	-	1,445	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
<b>Totals</b>	<b>94</b>	<b>44,641</b>				<b>95</b>	<b>95</b>	<b>99%</b>	<b>99%</b>

**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	1	30	0.0333	0.0001	0.0001	0	0	10000%	10000%
30-34	1	1,697	0.0006	0.0005	0.0005	1	1	104%	104%
35-39	2	7,198	0.0003	0.0009	0.0009	7	7	30%	30%
40-44	13	12,681	0.0010	0.0013	0.0013	17	17	76%	76%
45-49	36	20,858	0.0017	0.0017	0.0017	36	36	101%	101%
50-54	48	26,896	0.0018	0.0019	0.0019	52	52	92%	92%
55-59	36	24,551	0.0015	0.0020	0.0020	49	49	74%	74%
60-64	12	10,974	0.0011	0.0019	0.0019	21	21	58%	58%
65-69	-	2,397	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	149	107,282				185	185	81%	81%

**TERMINATION EXPERIENCE  
MALE**

Service	Age	Actual Terminations	Total Count	Actual Rate	Expected Terminations		Actual/Expected	
					Current	Proposed	Current (3) / (6)	Proposed (3) / (7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0	All	3,723	8,474	0.4393	3,454	3,454	108%	108%
1	All	6,428	22,162	0.2900	6,362	6,362	101%	101%
2	All	2,933	15,496	0.1893	3,067	3,067	96%	96%
3	All	1,819	12,476	0.1458	1,779	1,779	102%	102%
4	All	1,210	10,382	0.1165	1,143	1,143	106%	106%
5	All	910	8,910	0.1021	810	810	112%	112%
6	All	724	7,922	0.0914	629	629	115%	115%
7	All	546	7,177	0.0761	511	511	107%	107%
8	All	453	6,533	0.0693	426	426	106%	106%
9	All	332	5,986	0.0555	368	368	90%	90%
10 & over	20 - 24	0	0	N/A	0	0	N/A	N/A
10 & over	25 - 29	2	32	0.0625	2	2	93%	93%
10 & over	30 - 34	49	923	0.0531	43	43	114%	114%
10 & over	35 - 39	146	4,571	0.0319	142	142	103%	103%
10 & over	40 - 44	242	8,480	0.0285	174	174	139%	139%
10 & over	45 - 49	297	12,080	0.0246	235	235	126%	126%
10 & over	50 - 54	349	10,833	0.0322	361	361	97%	97%
10 & over	55 - 59	258	5,836	0.0442	400	400	65%	65%
10 & over	60 - 64	81	1,509	0.0537	185	185	44%	44%
10 & over	65 - 69	0	0	N/A	0	0	N/A	N/A
10 & over	70+	0	0	N/A	0	0	N/A	N/A
10 & over	Subtotal	1,424	44,264		1,542	1,542	92%	92%
Totals		20,502	149,782		20,092	20,092	102%	102%

**TERMINATION EXPERIENCE  
FEMALE**

Service	Age	Actual Terminations	Total Count	Actual Rate	Expected Terminations		Actual/Expected	
					Current	Proposed	Current (3) / (6)	Proposed (3) / (7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0	All	3,481	9,808	0.3549	3,426	3,426	102%	102%
1	All	9,735	39,756	0.2449	9,693	9,693	100%	100%
2	All	5,874	33,386	0.1759	5,683	5,683	103%	103%
3	All	3,957	28,525	0.1387	3,651	3,651	108%	108%
4	All	2,692	24,912	0.1081	2,599	2,599	104%	104%
5	All	2,172	21,983	0.0988	1,986	1,986	109%	109%
6	All	1,681	19,785	0.0850	1,591	1,591	106%	106%
7	All	1,308	18,258	0.0716	1,314	1,314	100%	100%
8	All	1,146	16,857	0.0680	1,078	1,078	106%	106%
9	All	884	15,355	0.0576	859	859	103%	103%
10 & over	20 - 24	0	0	N/A	0	0	N/A	N/A
10 & over	25 - 29	0	42	0.0000	3	3	0%	0%
10 & over	30 - 34	97	2,261	0.0429	100	100	97%	97%
10 & over	35 - 39	408	10,101	0.0404	335	335	122%	122%
10 & over	40 - 44	609	19,043	0.0320	468	468	130%	130%
10 & over	45 - 49	798	29,110	0.0274	632	632	126%	126%
10 & over	50 - 54	904	29,737	0.0304	747	747	121%	121%
10 & over	55 - 59	764	15,861	0.0482	569	569	134%	134%
10 & over	60 - 64	141	2,889	0.0488	158	158	89%	89%
10 & over	65 - 69	0	0	N/A	0	0	N/A	N/A
10 & over	70+	0	0	N/A	0	0	N/A	N/A
10 & over	Subtotal	3,721	109,044		3,011	3,011	124%	124%
Totals		36,651	337,669		34,893	34,893	105%	105%

**RETIREMENT EXPERIENCE  
MALE**

Age	Actual Retirements	Total Count	Actual Rate	Assumed Rate		Expected Retirements		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	156	674	0.2315	NA- Rate Matrix		135	101	116%	154%
50	67	335	0.2000	NA- Rate Matrix		67	60	100%	111%
51	65	381	0.1706	NA- Rate Matrix		76	69	85%	95%
52	105	473	0.2220	NA- Rate Matrix		95	85	111%	123%
53	102	497	0.2052	NA- Rate Matrix		99	89	103%	114%
54	139	559	0.2487	NA- Rate Matrix		112	101	124%	138%
55	121	567	0.2134	NA- Rate Matrix		113	113	107%	107%
56	115	564	0.2039	NA- Rate Matrix		113	113	102%	102%
57	111	570	0.1947	NA- Rate Matrix		114	114	97%	97%
58	144	553	0.2604	NA- Rate Matrix		111	111	130%	130%
59	112	449	0.2494	NA- Rate Matrix		90	90	125%	125%
60	205	1,008	0.2034	NA- Rate Matrix		204	204	101%	101%
61	257	920	0.2793	NA- Rate Matrix		184	184	140%	140%
62	231	784	0.2946	NA- Rate Matrix		292	292	79%	79%
63	159	665	0.2391	NA- Rate Matrix		200	200	80%	80%
64	199	592	0.3361	NA- Rate Matrix		157	157	127%	127%
65	242	715	0.3385	NA- Rate Matrix		270	289	90%	84%
66	128	501	0.2555	NA- Rate Matrix		112	134	114%	96%
67	90	398	0.2261	NA- Rate Matrix		89	106	101%	85%
68	67	288	0.2326	NA- Rate Matrix		65	77	104%	87%
69	46	236	0.1949	NA- Rate Matrix		51	62	90%	74%
Subtotal	2,861	11,729				2,747	2,750	104%	104%

**RETIREMENT EXPERIENCE  
FEMALE**

Age	Actual Retirements	Total Count	Actual Rate	Assumed Rate		Expected Retirements		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 50	296	1,490	0.1987	NA- Rate Matrix		298	224	99%	132%
50	137	786	0.1743	NA- Rate Matrix		157	141	87%	97%
51	162	928	0.1746	NA- Rate Matrix		186	167	87%	97%
52	181	985	0.1838	NA- Rate Matrix		197	177	92%	102%
53	184	1,011	0.1820	NA- Rate Matrix		212	182	87%	101%
54	245	1,084	0.2260	NA- Rate Matrix		238	195	103%	126%
55	270	1,075	0.2512	NA- Rate Matrix		247	247	109%	109%
56	282	1,077	0.2618	NA- Rate Matrix		258	258	109%	109%
57	268	1,001	0.2677	NA- Rate Matrix		250	250	107%	107%
58	246	904	0.2721	NA- Rate Matrix		244	244	101%	101%
59	262	826	0.3172	NA- Rate Matrix		231	231	113%	113%
60	531	2,441	0.2175	NA- Rate Matrix		526	526	101%	101%
61	612	2,182	0.2805	NA- Rate Matrix		633	633	97%	97%
62	537	1,780	0.3017	NA- Rate Matrix		685	685	78%	78%
63	388	1,353	0.2868	NA- Rate Matrix		359	359	108%	108%
64	337	1,065	0.3164	NA- Rate Matrix		308	308	109%	109%
65	418	1,187	0.3521	NA- Rate Matrix		415	480	101%	87%
66	227	784	0.2895	NA- Rate Matrix		157	208	145%	109%
67	154	549	0.2805	NA- Rate Matrix		82	146	187%	105%
68	87	412	0.2112	NA- Rate Matrix		62	110	141%	79%
69	103	339	0.3038	NA- Rate Matrix		68	91	152%	114%
Subtotal	5,927	23,259				5,816	5,865	102%	101%



**New Mexico ERB  
2010 Experience Study  
Salary Scale - Males & Females Combined (10 Years of Experience)**

Service	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%	8.50%	22.78%	20.40%	18.40%	13.50%	8.75%
1	7.75%	2.75%	7.84%	5.47%	3.47%	7.75%	3.00%
2	6.75%	1.75%	7.45%	5.08%	3.08%	6.75%	2.00%
3	6.25%	1.25%	6.81%	4.43%	2.43%	6.25%	1.50%
4	6.00%	1.00%	6.24%	3.87%	1.86%	6.00%	1.25%
5	5.75%	0.75%	6.09%	3.72%	1.72%	5.75%	1.00%
6	5.50%	0.50%	5.94%	3.57%	1.57%	5.50%	0.75%
7	5.25%	0.25%	6.02%	3.64%	1.64%	5.25%	0.50%
8	5.25%	0.25%	5.77%	3.39%	1.39%	5.25%	0.50%
9	5.25%	0.25%	5.59%	3.22%	1.22%	5.25%	0.50%
10+	5.00%	0.00%	4.38%	2.00%	0.00%	4.75%	0.00%
				2010	2008	2006	
a. Current Inflation Assumption				3.00%	3.00%	3.00%	
b. Current Productivity Component				2.00%	2.00%	2.00%	
c. Actual CPI-U Inflation for 6/30/00 - 6/30/10				2.37%	2.99%	2.62%	
d. Proposed Inflation Assumption				3.00%	3.00%	3.00%	
e. Apparent Productivity Component				2.00%	2.58%	2.50%	
f. Proposed Productivity Component				1.75%	2.00%	2.00%	

**New Mexico ERB  
2010 Experience Study  
Salary Scale - Males & Females Combined (5 Years of Experience)**

Index (1)	Current Salary Scales		Actual Experience (5 Years)			Proposed Salary Scale	
	Total (2)	Step Rate/ Promotional (3)	Total (4)	Above inflation (5)	Step rate/ Promotional (6)	Total (7)	Step rate/ Promotional (8)
0	13.50%	8.50%	30.07%	27.76%	25.66%	13.50%	8.75%
1	7.75%	2.75%	7.41%	5.11%	3.01%	7.75%	3.00%
2	6.75%	1.75%	7.77%	5.47%	3.37%	6.75%	2.00%
3	6.25%	1.25%	6.64%	4.33%	2.23%	6.25%	1.50%
4	6.00%	1.00%	5.89%	3.58%	1.48%	6.00%	1.25%
5	5.75%	0.75%	5.83%	3.52%	1.42%	5.75%	1.00%
6	5.50%	0.50%	5.54%	3.23%	1.13%	5.50%	0.75%
7	5.25%	0.25%	5.63%	3.32%	1.22%	5.25%	0.50%
8	5.25%	0.25%	5.46%	3.15%	1.06%	5.25%	0.50%
9	5.25%	0.25%	5.24%	2.93%	0.84%	5.25%	0.50%
10+	5.00%	0.00%	4.40%	2.10%	0.00%	4.75%	0.00%
				2010	2008	2006	
a. Current Inflation Assumption				3.00%	3.00%	3.00%	
b. Current Productivity Component				2.00%	2.00%	2.00%	
c. Actual CPI-U Inflation for 6/30/05 - 6/30/10				2.30%	3.56%	2.65%	
d. Proposed Inflation Assumption				3.00%	3.00%	3.00%	
e. Apparent Productivity Component				2.10%	2.58%	2.50%	
f. Proposed Productivity Component				1.75%	2.00%	2.00%	