EMPLOYEES' RETIREMENT SYSTEM OF RHODE ISLAND

ACTUARIAL EXPERIENCE INVESTIGATION
FOR THE SIX–YEAR PERIOD ENDING JUNE 30, 2013

June 18, 2014

Retirement Board
50 Service Avenue, 2nd Floor
Warwick, RI 02886-1021

Dear Members of the Board:

Subject: Results of 2014 Actuarial Experience Study for ERSRI

We are pleased to present our report on the results of the 2014 Actuarial Experience Investigation Study for the Employees' Retirement System of Rhode Island (ERSRI). It includes a discussion of recent experience, it presents our recommendations for new actuarial assumptions and methods, and it provides information about the actuarial impact of these recommendations on the liabilities and other key actuarial measures. This report contains the results of the experience study for all groups covered under ERSRI, including State Employees, Teachers, MERS, State Police, and State Judges.

Using the recommended set of actuarial assumptions should present a more accurate portrayal of ERSRI's financial condition and should reduce the magnitude of future experience gains and losses.

This study was conducted in accordance with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. The undersigned meet all of the Qualification Standards of the American Academy of Actuaries. In addition, both of the undersigned have extensive experience as retained public sector actuaries for several large, statewide public retirement systems.

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

Sincerely,

 Respectfully submitted,

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Senior Consultant

Mark R. Randall, MAAA, EA
Executive Vice President

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SECTION I
EXECUTIVE SUMMARY

Section I
Summary of Recommendations

Our recommended changes to the current actuarial assumptions may be summarized as follows:

Economic Assumptions

1. We recommend no change to the current 2.75% inflation assumption.

2. We recommend no change to the current 7.50% nominal investment return assumption. Based on a blending of the current capital market assumptions from eight consulting firms, a 7.50% investment return is in an ideal range that is between the expected arithmetic return based on the target asset allocation and the median expected geometric return, especially when adjusted to reflect the appropriate time horizon for which this assumption is used.

3. We recommend reducing the productivity component of the salary scale assumption by 0.50%, from 1.25% to 0.75%, above inflation for State Employees, Teachers, General MERS, and for Judges and by 0.25%, from 1.50% to 1.25%, above inflation for MERS P&F and State Police. This recommendation reflects a reduction in the spread between inflation and salary increases experienced in the overall economy and the expectation of lower future salary increases due to continued budgetary constraints for employers.

4. In accordance with the observed experience, we are recommending small adjustments in the service-based promotional/longevity component of the salary scale for all employee groups.

5. In conjunction with the reduced wage inflation assumptions, we are recommending a reduction in the payroll growth rate assumption from 3.75% to 3.25% for State Employees and General MERS, from 3.75% to 3.00% for Teachers; from 3.75% to 3.50% for MERS P&F, from 4.00% to 3.50% for Judges; and from 4.00% to 3.75% for State Police. Changing the payroll growth assumption has no impact on the liabilities, but does assume there is a lower growth in the future payroll to amortize the UAAL, which results in an increase in the current contribution requirements.

6. We recommend no change to the current methodologies and assumptions for the contingent post-retirement benefit adjustments.

Mortality Assumptions

7. We recommend no change to the post-retirement mortality tables for non-disabled retirees.

8. We recommend no change to the post-retirement mortality tables for disabled retirees.

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9. We recommend no change to the pre-retirement mortality tables for active employees.

Other Demographic Assumptions

10. For State Employees, Teachers, and General MERS, we recommend changing the structure of the retirement pattern from the current complex structure that was created based on the old Schedule A and B benefits to one that is much simpler, but produces similar liabilities and contribution rates.

11. For State Employees, Teachers, and General MERS, we recommend slightly increasing the rates of termination. This change would have a slightly positive impact on liabilities and contribution rates.

12. For MERS P&F, we recommend decreasing the rates of termination. This change would have a slightly negative impact on liabilities and contribution rates.

13. We recommend slightly modifying the rates of disability for most groups based on the experience of the individual group.

14. We recommend no change to the current marriage assumption and spousal age difference.

Actuarial Methods and Policies

15. We recommend no change to the current asset smoothing method.

16. We recommend no change to the current funding method. The individual Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of the System. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year to year, and allocates costs among various generations of taxpayers in a reasonable manner. It is by far the most commonly used actuarial cost method for large public retirement systems. We continue to believe this is the most appropriate funding method.

SECTION II
INTRODUCTION

Section II
Introduction

Summary of Process

A periodic review and selection of the actuarial assumptions is one of many important components of understanding and managing the financial aspects of the Employees' Retirement System of Rhode Island (ERSRI). Use of outdated or inappropriate assumptions can result in understated costs which will lead to higher future contribution requirements or perhaps an inability to pay benefits when due; or, on the other hand, produce overstated costs which place an unnecessarily large burden on the current generation of members, employers, and taxpayers.

A single set of assumptions is typically not expected to be suitable forever. As the actual experience unfolds or the future expectations change, the assumptions should be reviewed and adjusted accordingly.

It is important to recognize that the impact from various outcomes and the ability to adjust from experience deviating from the assumption are not symmetric. Due to compounding economic forces, legal limitations, and moral obligations outcomes from underestimating future liabilities are much more difficult to manage than outcomes of overestimates, and that un-symmetric risk should be considered when the assumption set, investment policy and funding policy are created. As such, the assumption set used in the valuation process needs to represent the best estimate of the future experience of the System and be at least as likely, if not more than likely, to overestimate the future liabilities versus underestimate them.

Using this strategic mindset, each assumption was analyzed compared to the actual experience of ERSRI and general experience of other large public employee retirement systems. Changes in certain assumptions and methods are suggested upon this comparison to remove any bias that may exist and to perhaps add in a slight margin for future adverse experience where appropriate. Next, the assumption set as a whole was analyzed for consistency and to ensure that the projection of liabilities was reasonable and consistent with historical trends.

The following report provides our recommended changes to the current actuarial assumptions.

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

- 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 others, such as the investment return assumption, the link between past and future results is much weaker. In either case, actuaries should review the plan's assumptions periodically and determine whether these assumptions are consistent with actual past experience and with anticipated future experience.

The last such actuarial experience investigation was performed in conjunction with the June 30, 2010 actuarial valuation. For this experience study, we have analyzed ERSRI's experience for the six-year period from June 30, 2007 through June 30, 2013 (FY 2008 – FY 2013). Note that the first three years were also included in the last experience study.

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 a few instances, we chose to use a longer period, up to ten years, in order to further increase the soundness of our conclusions.

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 of "expected" decrements is determined by multiplying the probability of the occurrence at the given age, by the "exposures" at that same age. For example, let's look at a rate of retirement of 15% 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

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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. (However, in some cases we prefer to set our assumptions to produce an A/E ratio a little above or below 100%, in order to introduce some conservatism.) Of course we not only look at the assumptions as a whole, but we also review how well they fit the actual results by gender, by age, and by service.

If the data leads the actuary to conclude that new tables are needed, the actuary may "graduate" or smooth the results, since the raw results can be quite uneven from age to age or from service to service.

Please bear in mind that, while the recommended assumption set represents our best estimate, there are other reasonable assumptions sets that could be supported. Some reasonable assumption sets would show higher or lower liabilities or costs. For example, while our analysis concludes that the current 7.50% investment return assumption is appropriate, others might argue that a 7.25% or 7.75% rate is more appropriate.

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. Finally, tables summarizing the analysis of the assumptions are in Section VII.

Section VII Exhibits

The exhibits in Section VII should generally be self-explanatory. For example, on page 83, we show the exhibit analyzing the termination rates for Teachers. The second column shows the total number of Teachers who terminated during the study period. This excludes members who died, became disabled or retired. Column (3), labeled "Total Count" shows the total exposures. This is the number of Teachers who could have terminated during any of the years. On this exhibit, the exposures exclude anyone eligible for retirement. A member is counted in each year he could have terminated, so the total shown is the total exposures for the six-year period. Colum (4) shows the probability of termination based on the raw data. That is, it is the result of dividing the actual number of terminations (col. 2) by the number exposed (col. 3). Column (5) shows the current termination rate and column (6) shows the new recommended termination rate. Columns (7) and (8) show the expected numbers of terminations based on the current and proposed termination assumptions. Columns (9) and (10) show the Actual-to-Expected ratios under the current and proposed termination assumptions.

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SECTION III

ANALYSIS OF EXPERIENCE AND RECOMMENDATIONS

Section III
Analysis of Experience and Recommendations

We will begin by discussing the economic assumptions: inflation, the investment return rate, the salary increase assumptions, the payroll growth rate, etc. Then we will discuss the demographic assumptions: mortality, disability, termination, retirement, etc. Finally, we will discuss the actuarial methods used.

INFLATION AND INVESTMENT RETURN ASSUMPTIONS

Actuarial Standards of Practice (ASOP) No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, provides guidance to actuaries on giving advice on selecting economic assumptions for measuring obligations for defined benefit plans.

Generally, the economic assumptions are much more subjective in nature than the demographic assumptions. As no one knows what the future holds, it is necessary for the actuary to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one right answer, the current standard calls for the actuary to develop a best-estimate range for each economic assumption, and then recommend a specific point within that range. Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

Note, ASOP No. 27 was revised and adopted by the Actuarial Standards Board (ASB) in September 2013. While this revised standard will not be effective for any actuarial work products with a measurement date prior to October 1, 2014, our recommended economic assumptions are intended to comply with this revised practice standard.

INFLATION ASSUMPTION

By "inflation," we mean price inflation, as measured by annual increases in the Consumer Price Index (CPI). This inflation assumption underlies most of the other economic assumptions. It impacts investment return, salary increases, payroll growth, and cost-of-living increases. The current annual inflation assumption is 2.75%.

The chart on the following page shows the average annual inflation in each of the ten consecutive five-year periods over the last fifty years.

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Average Annual Inflation
CPI-U, Five-Calendar-Year Averages
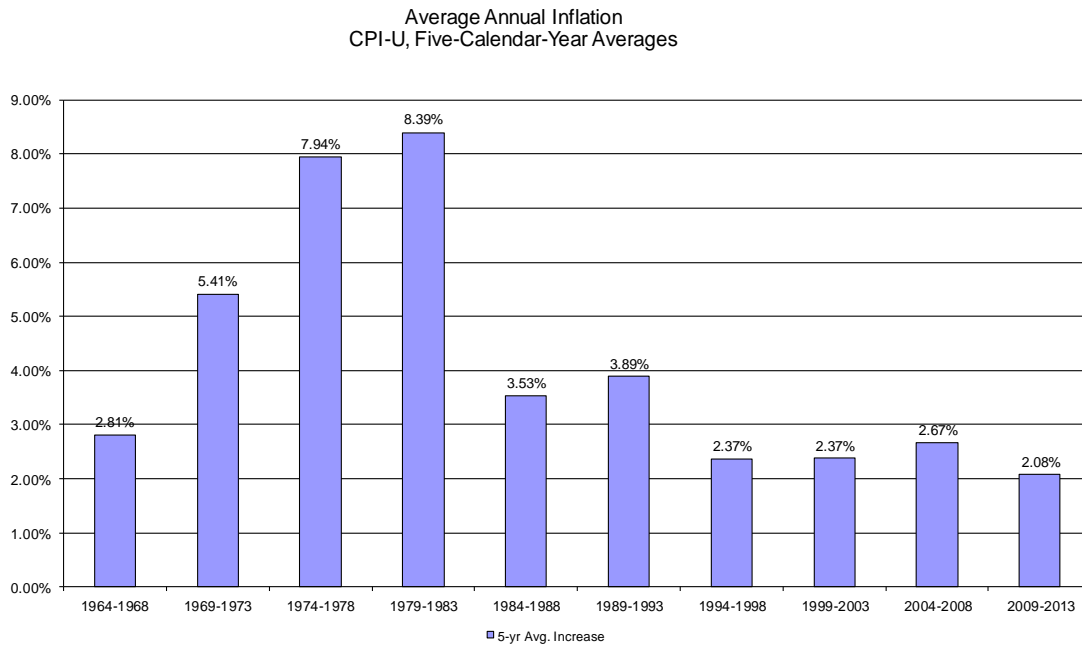
Source: Bureau of Labor Statistics, CPI-U, all items, not seasonally adjusted

The table below shows the average inflation over various periods, ending December 2013:

Periods Ending Dec. 2013	Average Annual Increase in CPI-U
Last five (5) years	2.08%
Last ten (10) years	2.37%
Last fifteen (15) years	2.37%
Last twenty (20) years	2.37%
Last thirty (25) years	2.67%
Last thirty (30) years	2.82%
Since 1913 (first available year)	3.20%

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

As you can see, inflation has been relatively low over the last 30 years.

Most investment consulting firms, in setting their capital market assumptions, currently assume that inflation will be less than 3.00%. We examined the 2014 capital market assumption sets for eight investment consulting firms. The average assumption for inflation was 2.48%, with a range of 2.20% to 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.

In the Social Security Administration's 2013 Trustees Report, the Office of the Chief Actuary is projecting a long-term average annual inflation rate of 2.80% under the intermediate cost

assumption. (The low cost assumption was 1.80% and the high cost assumption was 3.80%.) These inflation assumptions have remained unchanged for the last several years.

Another source of information about future inflation is the market for U.S. Treasury bonds. The December 31, 2013 yield for a 20-year inflation indexed Treasury bond (20-year TIPS) was 1.23% plus actual inflation. The yield for a 20-year non-indexed U.S. Treasury bond was 3.54%. This means that on that day the bond market was predicting that inflation over the next twenty years would average 2.28% [(1 + 3.54%) / (1 + 1.23%) - 1] per year. One year earlier, as of December 31, 2012, the spread between the 20-year inflation protected and constant maturity bonds was only marginally higher, with a difference of 2.38%, so there has been little change in this expectation. The imputed 30-year inflation level is close to the 20-year level, being 2.26% and 2.46% at December 31, 2013 and December 31, 2012, respectively.

Also, the Philadelphia Federal Reserve conducts a quarterly survey of the Society of Professional Forecasters. Their most recent forecast (first quarter of 2014) was for inflation over the next ten years (i.e. 2014 through 2023) to average 2.30% per year. The survey forecasts have also remained relatively stable over the last few years.

As a result, we recommend continued use of the 2.75% inflation assumption. While the current assumption is slightly higher than the expected rates of future inflation for many of the various sources above, including the bond market and the surveys of the Society of Professional Forecasters, it is within a reasonable range of acceptable assumptions especially when adjusted for time horizon. It is also slightly less than the assumption used by most of ERSRI's peers and equal to the 2.75% inflation assumption used by PCA (ERSRI's investment consultant).

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INVESTMENT RETURN ASSUMPTION

The investment return assumption is one of the principal assumptions used 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 contribution rates. Currently, it is assumed that future investment returns will average 7.50% per year, net of investment and administrative expenses. The current assumption assumes inflation of 2.75% per annum and an annual real rate of return of 4.75%, net of expenses.

Similar to the inflation assumption, past performance is not a reliable indicator of future performance, even when averaged over a long time period. Also, the actual asset allocation of the trust fund will significantly impact the overall performance, so returns achieved under a different allocation are not meaningful.

The Public Fund Survey (PFS) is a joint venture of the National Association of State Retirement Administrators (NASRA) and the National Council on Teacher Retirement (NCTR). More than 85% of all state and local government pension assets and members in the U.S. are represented in this survey. The latest PFS shows that the median investment return assumption for large public plans is 7.90%. The survey median has slightly decreased from 8.00% in the same survey conducted last year. Subtracting the rate of inflation assumed for each plan gives a median real rate of return of 4.50%, which is slightly lower than the real rate of return assumption used by ERSRI. However, not all of the information supplied to the survey from peer systems is actually the inflation assumption, but instead the wage inflation assumption, making the comparable median higher than 4.50%. While we do not recommend the selection of an assumption based on prevalence information, it is still informative to identify where ERSRI is compared to its peers. Here is a chart showing the distribution of the investment return assumptions in the Public Fund Survey:
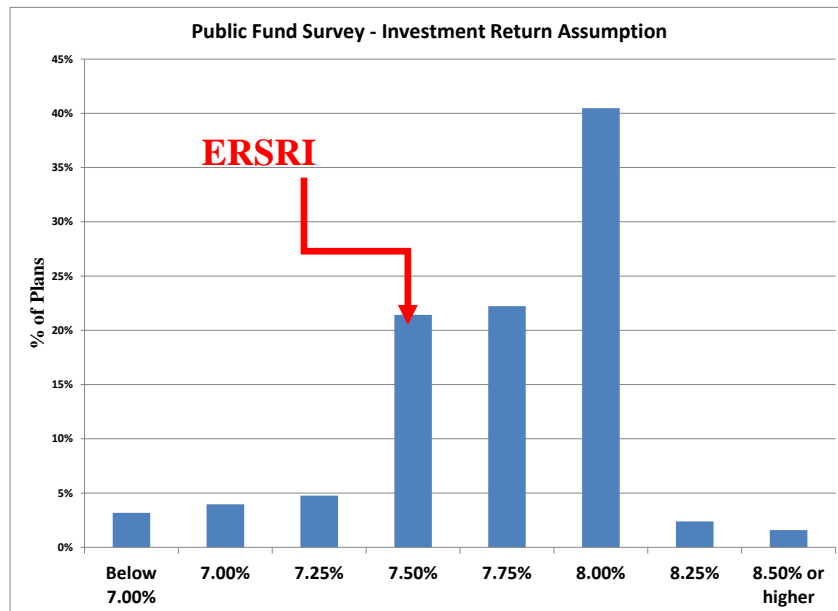
Source: Public Fund Survey (n=126). Median investment return assumption: 7.90% nominal return.

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It is important to point out that while only 21.4% of peer Systems use a nominal assumption of 7.50% or lower, there has been a strong trend of lowering this assumption. For example, when ERSRI first adopted this assumption in 2011, only 4 of the 126 Funds (approximately 3%) used a nominal assumption of 7.5% or below. In addition, the data on the survey typically lags by 12-18 months and the percentage using 7.5% or below is most definitely higher if more current data was available.

Expenses

Since the trust fund pays expenses in addition to member benefits and refunds, we must make some assumption about these. 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.

For investment expenses, investment consulting firms periodically issue reports that describe their capital market assumptions. The estimates for core investments (i.e., fixed income, equities, and real estate) are generally based on anticipated returns produced by passive index funds that are net of investment related fees. The investment return expectations for the alternative asset class such as private equity and hedge funds are also net of investment expenses. Therefore, we did not make any adjustments to account for investment related expenses. Some of the Retirement Systems may also employ active management investment strategies that result in higher investment expenses compared to strategies that invest in passive index funds. We have assumed that active management strategies would result in the same returns, net of investment expenses, as passive management strategies.

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. The following chart shows the administrative expenses for the last six years expressed as a percentage of the assets, adjusted for cash flow, each year:

Fiscal Year	Administrative
2013	0.12%
2012	0.12%
2011	0.13%
2010	0.13%
2009	0.11%
2008	0.10%
Average	0.12%

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Based on this information, we have assumed that 0.12% (12 basis points) of each year's investment return will be used to pay administrative expenses. This assumption is then used in setting the investment return assumption.

Asset Allocation

We believe the most appropriate approach to selecting an investment return assumption is to identify expected returns given the funds' asset allocation mapped to forward-looking capital market assumptions. Below is a summary of the asset allocation for ERSRI that was used in the analysis.

ASSET CLASS	ERSRI
Global Equity	38%
Equity Hedge Funds	8%
Private Equity	7%
Core Fixed Income	15%
Absolute Return Hedge Funds	7%
Real Estate	8%
Other Real Return Assets	9%
Cash, Overlay and Money Market	3%
Infrastructure	5%
Total	100%

Because GRS is a benefits consulting firm and does not develop or maintain our own capital market assumptions, we utilized the forward-looking return expectations developed by the following investment consulting firms:

- BNY Mellon
- JP Morgan
- Mercer Consulting
- RV Kuhns

- Hewitt EnnisKnupp
- New England Pension Consultants (NEPC)
- Pension Consulting Alliance (PCA)
- Towers Watson

These investment consulting firms periodically issue reports that describe their capital market assumptions. That is, their estimates of expected returns, volatility, and correlations. While these assumptions are developed based upon historical analysis, many of these firms also incorporate forward-looking adjustments to better reflect near-term expectations.

When an analysis is performed to determine historical investment performance, calculating an average return based on a geometric basis is more appropriate for measuring the accumulation of wealth because it takes into account the return volatility (a.k.a. volatility drag). However, forecasting returns using a geometric average measure will generally result in a downward biased measure, especially when used as it is in an actuarial valuation to estimate a future value of wealth. On the other hand, forecasting a return using a measure based on an arithmetic

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average tends to have an upward bias in forward-looking estimates. The following is the synopsis from a 2003 article on this subject in the Financial Analysts Journal:

> *An unbiased forecast of the terminal value of a portfolio requires compounding of its initial value at its arithmetic mean return for the length of the investment period. Compounding at the arithmetic average historical return, however, results in an upwardly biased forecast. This bias does not necessarily disappear even if the sample average return is itself an unbiased estimator of the true mean, the average is computed from a long data series, and returns are generated according to a stable distribution. In contrast, forecasts obtained by compounding at the geometric average will generally be biased downward. The biases are empirically significant. For investment horizons of 40 years, the difference in forecasts of cumulative performance can easily exceed a factor of 2. And the percentage difference in forecasts grows with the investment horizon, as well as with the imprecision in the estimate of the mean return. For typical investment horizons, the proper compounding rate is in between the arithmetic and geometric values.*

> *Geometric or Arithmetic Mean: A Reconsideration* ©*2003, Eric Jacquier, Alex Kane, and Alan J. Marcus*

Because of these effects, we recommend developing a single best point estimate that is somewhere between these two averages.

Given the plan's current asset allocation and the investment consultant's capital market assumptions, the development of the average nominal return, net of investment expenses, is provided in the following tables. The table below shows the expected nominal return (arithmetic average) for ERSRI using each of the investment consulting firm's capital market assumptions. The forward-looking return expectations were mapped to the target asset class allocation.

Expected Nominal Return for ERSRI Based on Short-Term Capital Market Assumptions
(Return Expectations for the Next 7 to 10 Years)

Investment Consultant	Investment Consultant Expected Nominal Return	Investment Consultant Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Plan Incurred Expense Assumption	Expected Nominal Return Net of Expenses (6)-(7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	7.13%	2.75%	4.38%	2.75%	7.13%	0.12%	7.01%
2	7.58%	3.00%	4.58%	2.75%	7.33%	0.12%	7.21%
3	7.15%	2.50%	4.65%	2.75%	7.40%	0.12%	7.28%
4	7.24%	2.25%	4.99%	2.75%	7.74%	0.12%	7.62%
5	7.31%	2.26%	5.05%	2.75%	7.80%	0.12%	7.68%
6	7.53%	2.40%	5.13%	2.75%	7.88%	0.12%	7.76%
7	7.35%	2.20%	5.15%	2.75%	7.90%	0.12%	7.78%
8	8.23%	2.50%	5.73%	2.75%	8.48%	0.12%	8.36%
Average	**7.44%**	**2.48%**	**4.96%**	**2.75%**	**7.71%**	**0.12%**	**7.59%**

Note: The expected nominal return assumption is based on the arithmetic average.

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As can be seen from the previous Table, based on the 2014 capital market assumptions for investment consultant #1, the annual expected rate of return is 7.13%. Based on their inflation assumption of 2.75%, this implies an expected net real return of 4.38%. Adding the plan's 2.75% inflation assumption and subtracting 0.12% for plan incurred administrative expenses from the expected real return gives a nominal expected return for ERSRI of 7.01%. The overall 7.59% is the arithmetic average and becomes the top end of the range for our analysis.

In addition to examining the expected one-year return, it is important to review anticipated volatility of the investment portfolio and to understand the range of net returns that could be produced by the investment portfolio. Therefore, the table below provides the 25th, 50th, and 75th percentiles of the 10-year geometric average of the expected nominal return, net of expenses, as well as the probability of exceeding the current 7.50% assumption.

Expected Annual Geometric Returns and Return Probabilities
(Based on Short-Term Capital Market Assumptions)

| Investment Consultant | Distribution of 10-Year Average Geometric Net Nominal Return | | | Probability of exceeding 7.50% * |
	25th	50th	75th	
(1)	(2)	(3)	(4)	(5)
1	4.10%	6.43%	8.80%	37.9%
2	3.67%	6.40%	9.19%	39.4%
3	4.02%	6.57%	9.19%	40.5%
4	4.37%	6.92%	9.53%	44.0%
5	4.91%	7.14%	9.43%	45.8%
6	5.02%	7.23%	9.49%	46.8%
7	5.00%	7.24%	9.53%	46.9%
8	5.59%	7.83%	10.11%	53.9%
Average	**4.59%**	**6.97%**	**9.41%**	**44.4%**

*Plan's current return assumption net of expenses.

However, the capital market assumptions provided by the investment consultants and used in the analysis above are based on 7 to 10 year investment horizon. Investment consultants develop their forecast assumptions with this time horizon in part because most pension investment management teams use this time period for developing and monitoring their investment strategies.

On the other hand, the investment return assumption used in the actuarial valuation has a much longer investment horizon. Therefore, it may be necessary to identify and reflect differences in the economy and financial markets over the short-term and long-term time horizon.

Expected investment returns can be thought of as the sum of a risk-free rate of return and a risk premium. This is the fundamental premise in the Capital Asset Pricing Model (CAPM) that is used in Modern Portfolio Theory. Riskier investments have a higher risk premium to

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compensate the investor for the increased uncertainty. Generally, the risk premium for each asset class is constant over long periods of time. But there can be differences in the risk free return, depending on the investor's time horizon. We define a risk-free investment as one where the expected return is known with absolute certainty. This also means that the risk-free investment has no default and reinvestment risk. Based on this definition, we believe it is reasonable to benchmark a risk-free rate using zero coupon U.S. Treasury securities. Thus a 10-year risk-free rate is equal to the current yield of a 10-year zero coupon US Treasury bond.

For this analysis, we have chosen the 10-year yield as our short-term point because it is the same investment horizon for the return expectations provided by the investment consultant. For the longer-term point, we have chosen the 16-year yield because it is close to an approximation of the duration of the liabilities of ERSRI, meaning the average, interest-discounted benefit payment of ERSRI is expected to be paid 16 years form the valuation date. As of April 1, 2014, the yields of the 10-year and 16-year zero coupon Treasury bonds were 2.90% and 3.39%, respectively. Therefore, it is reasonable to assume that even as small an adjustment to the investment time horizon as 6 years, from 10 years to 16 years, the risk free rate of return, and corresponding expected return on the portfolio would be 0.49% higher.

The Table below provides the 25th, 50th, and 75th percentiles of the 16-year geometric average of the expected nominal return, net of expenses, as well as the probability of exceeding the current 7.50% assumption, based on the capital market assumptions adjusted to reflect the difference in the risk-free returns due to the different investment time horizons.

Expected Annual Geometric Returns and Return Probabilities (Based on Short-Term Capital Market Assumptions Adjusted By GRS to Reflect a 16-Year Investment Horizon)

Investment Consultant	Distribution of 16-Year Average Geometric Net Nominal Return			Probability of exceeding 7.50% *
	25th	50th	75th	
(1)	(2)	(3)	(4)	(5)
1	5.08%	6.92%	8.79%	41.7%
2	4.73%	6.89%	9.10%	42.6%
3	5.04%	7.07%	9.13%	44.3%
4	5.39%	7.41%	9.47%	48.8%
5	5.86%	7.64%	9.44%	52.1%
6	5.97%	7.72%	9.51%	53.4%
7	5.96%	7.73%	9.54%	53.5%
8	6.55%	8.32%	10.12%	62.2%
Average	**5.57%**	**7.46%**	**9.39%**	**49.8%**

*Plan's current return assumption net of expenses.

Two investment consulting firms, Hewitt EnnisKnupp and NEPC, develop capital market assumptions with a 30-year investment horizon. Therefore, we can use their information to

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validate our adjustment to reflect a longer time horizon. The assumptions from both firms would support the 7.50% investment return assumption based on a geometric average.

Based on this analysis, we recommend that ERSRI continue using a 7.50% investment return assumption, which is comprised of a 4.75% net real return and a 2.75% inflation assumption.

7.50% is below the 7.59% arithmetic average based on the average of the investment consulting firms analyzed. Also, while there is slightly less than a 50% (44.4%) likelihood of attaining a 7.50% investment return over the next 10 years, the probability is projected to be closer to 50% over a longer time horizon.   Since ERSRI is anticipated to continue to exist well into the future, has a post-retirement benefit increase provision that is contingent on investment performance, and a strong funding policy for making up shortfalls if they occur, a longer term horizon is appropriate for setting this assumption.

We believe this recommendation satisfies the best-estimate requirement under ASOP No. 27 as revised and adopted in September 2013. Also, this recommendation is consistent with the recommendations regarding the use of an investment return assumption that is estimated to be realizable at least 50% of the time from a report released by the Society of Actuaries Blue Ribbon Panel on public pension plan funding in February 2014.

Post-Retirement Benefit Increases

All members of ERSRI and MERS are eligible for post-retirement increases if the individual plan they participate in is over 80% funded (State, Teachers, JRBT, and STPL are all commingled to determine if they meet this requirement). The amount of increase is equal to the average 5-year investment return of the trust fund less 5.5%.

We currently assume the increases will be 2% when they occur. This is determined by subtracting the 5.5% from the assumed return of 7.5%.   We recommend no change to this assumption.

Regarding the 80% funded contingency, the 2013 valuation for State Employees, Teachers, JRBT, and STPL assumed the post-retirement increases would be suspended for 14 years.   Based on projections from the 2013 valuation and a modified version based on the recommended assumption set in this report, we recommend the continued use of this assumption, meaning the 2014 valuations will assume the increases will be suspended for 13 years following the valuation date. The number of years the post-retirement increases are expected to be suspended will continue to decrease by 1 year in each future valuation.

For MERS, most of the MERS units are either already 80% funded or are very close to being so and thus will be 80% funded over a short period of time.   As such, we have not reflected any suspension in the increases except for one that may be known to occur the year following the valuation.   We recommend continuing this methodology.

Salary increase rates

In order to project future benefits, the actuary must project future salary increases. Salaries may increase for a variety of reasons:

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- Across-the-board increases for all employees;
- Across-the-board increases for a given group of employees;
- Increases to a minimum salary schedule;
- Additional pay for additional duties;
- Step or service-related increases;
- Increases for acquisition of advanced degrees or specialized training;
- Promotions; or
- Merit increases, if available.

Our salary increase assumption is meant to reflect all of these types of increases.

The actuary should not look at the overall increases in payroll in setting this assumption, because payroll can grow at a rate different from the average pay increase for individual members. To analyze salary increases, we examine the actual increase in salary for each member who is active in two consecutive fiscal years.

Salary increases for governmental employees can vary significantly from year to year. When the employer's tax revenues stall or increase slowly, salary increases often are small or nonexistent. During good times, salary increases can be larger. Our experience across many governmental plans also shows several occasions in which salary increases will be low for a period of several years followed by a significant increase in one year. Therefore, for this assumption in particular, we prefer to use data over a longer period in establishing our assumptions. We used a ten-year period for this analysis.

Most actuaries recommend salary increase assumptions that include an element that depends on the member's age or service, especially for large, public retirement systems. It is typical to assume larger pay increases for younger or shorter-service employees. This is done in order to reflect pay increases that accompany step increases, changes in job responsibility, promotions, demonstrated merit, etc. The experience shows salaries have been more closely correlated to service (rather than age), as promotions and productivity increases tend to be greater in the first few years of a career, even if the new employee is older than the average new hire.

We analyzed the salary increases based on the change in the member's reported pay from one year to the next. That is, we looked at each member who appeared as an active member in two consecutive valuations individually, and measured his/her salary increase. Then we grouped the increases for all members with the same service, and determined their average increase.

If we graph the increases by service, we usually get a graph where the increases are larger for shorter service employees and then level out at a lower level after a period that may be ten to twenty-five years. It might look like this, although in practice not this smooth:

Salary Increases by Service
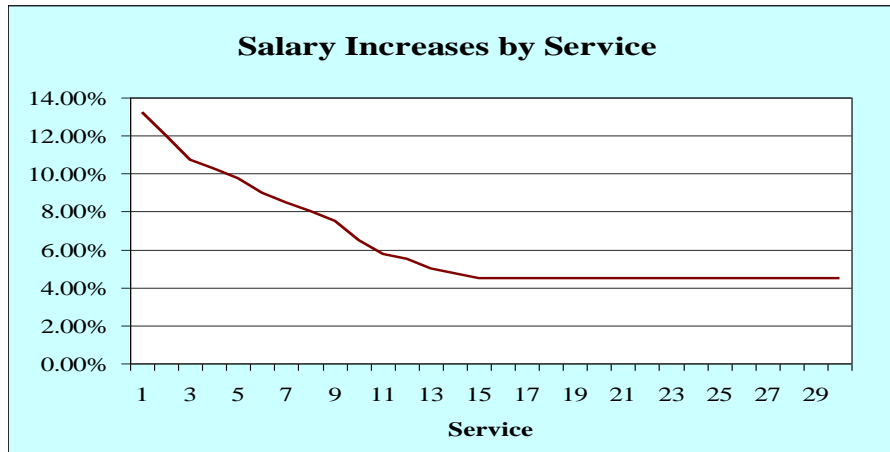
Therefore, we divide the task of setting the salary increase into two pieces:

1. Determining the assumption for long-service employees
2. Determining the additional increases to be applied to shorter-service employees

The next two subsections will discuss these components of the salary assumption.

Salary increase assumptions for long-service employees (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 stopped or are minimal. Promotions occur with less frequency. Additional training or acquisition of advanced degrees usually occurs early in the career. In theory, then, salary increases for longer-service employees are almost entirely driven by wage inflation. Wage inflation is the increase in the average wage of all members of the workforce.

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 0.45%, and for the last twenty years, wage inflation has exceeded price inflation by about 0.85%. Since 1951, wage inflation has been about 1.00% a year larger than price inflation.

We currently assume wage inflation for both State Employees and Teachers will be 4.00%. This 4.00% assumed increase can be thought of as the sum of our 2.75% price inflation assumption and 1.25% addition for productivity gains. Note that the assumed productivity growth is above both the 50-year average and the last ten-year average for the economy as a whole.

For State Employees, our study shows that for members with at least twenty-five years of service, the average annual salary increase during the ten-year period was 2.96%. Inflation during this 10-year period averaged 2.43%. Therefore, long-service employees received an average salary increase of 0.56% above inflation. As a result, we are proposing a decrease from

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4.00% to 3.50% for wage inflation. The new 3.50% assumption is composed of a 2.75% inflation rate plus 0.75% for productivity growth. The following table summarizes this for all of the groups:

Wage Inflation (10-Year Experience)				
	State Employees	Teachers	MERS General	MERS P&F
Current Assumption	4.00%	4.00%	4.00%	4.25%
Less Assumed Inflation	2.75%	2.75%	2.75%	2.75%
Assumed General Productivity	1.25%	1.25%	1.25%	1.50%
Actual Productivity Above Inflation for last 10 Years	0.54%	0.46%	0.65%	1.52%
Recommended Assumption	0.75%	0.75%	0.75%	1.25%

The ERSRI data alone supports a productivity decrease. In addition, we believe it is reasonable because:

- The national statistics show a continuing decrease in the spread between wage inflation and price inflation.

- Data for the last three years of the period supports the lower assumption. During this period, members with at least 25 years of service received 0.33% above inflation.

- We expect increasing pressure on salaries due to the projected increases in the costs for ERSRI and other benefit programs (healthcare).

For MERS P&F, we are recommending lowering their productivity component from 1.50% to 1.25%. While historical data (more than 10 years) has been close to the current 1.50%, more recent data has been lower and the same economic pressure impacting the rest of the economy and general employees will likely lead to lower than normal salary increases for this employee group for the next decade.

This change would lower the liabilities and contribution requirements.

Salary increase assumptions for shorter-service employees

To analyze the service-related salary assumption, we looked at the excess in the average increases for shorter-service employees over the average for longer-service employees. For example, Teachers with three years of service received an average annual increase of 8.82%, which was 5.94% more than the average increase of 2.88% for Teachers with twelve or more years of service.

We then determined new service-related assumptions reflecting this data. In all cases, the impact was small.

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Details of our analysis are shown in Section VII on pages 86-89.

Payroll growth rate

The salary increase rates discussed above are assumptions applied to individuals and are used in projecting future benefits. We use a separate payroll growth assumption (currently 3.75% annually for all groups) in determining the annual payment needed to amortize the unfunded actuarial accrued liability. The amortization payments are calculated to be a level percentage of payroll. Therefore, as payroll increases over time, these amortization payments will also increase.

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 members 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, Governmental Accounting Standards Board Statements No. 25 and 27 (GASB 25 and GASB 27) prohibit actuaries from using anticipated membership growth in setting the payroll growth assumption.

In theory, payroll growth in the absence of membership growth should approximate the wage inflation assumption (proposed to be 3.50%). However, we have generally set this assumption more conservatively, because we anticipate slower growth over the next twenty years as baby boomers retire and are replaced by younger members with lower salaries.

Over the last ten valuations, the payroll for State Employees has grown an average of 1.22% per year. However, the number of State Employees actually decreased by 15% over this period. Backing out the decreasing population, payroll would have grown on average by 2.88% if the population had been constant. This represents payroll growth 0.45% above actual inflation (2.43%) for the observation period. The following provides the same data for all groups.

Overall Payroll (10 Year Experience)				
All values are per year	State Employees	Teachers	MERS General	MERS P&F
Actual Payroll Growth	1.22%	1.82%	1.60%	5.64%
Change in Population	-1.67%	-0.90%	-1.57%	2.33%
Actual Payroll Growth with Constant Population	2.88%	2.72%	3.17%	3.31%
Actual Inflation	2.43%	2.43%	2.43%	2.43%
Actual Growth over Inflation	0.45%	0.29%	0.74%	0.88%

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Based on the last 10 years, it appears the current assumption of 1.00% above inflation is too high for all groups. Based on data since 1996, the actual growth over inflation, after adjusting for population growth, has been 0.60% for State Employees and 0.48% for Teachers, still less than the current 1.0% assumption. Since 2008, the growth over inflation for all four groups has been 0.32%, -0.54%, 0.20%, and 0.74%; respectively. Clearly, the shorter term economic cycle has had an impact on payroll and salary growth.

However, we also need to take into account future projections. We projected the payroll for current members based on the assumed salary increases for the individuals and their assumed termination or retirement rates. We then added in enough new employees each year to replace them. Pay for the first group of new members was initialized based on actual average pay for current new members, and thereafter pay was projected based on the salary assumption and expected retirements and terminations for this cohort of new members. For each subsequent cohort of new members needed to replace the retired and terminated members we increased the starting average pay by 3.50% per year (4.00% for MERS P&F), consistent with the wage inflation assumption. The following table provides the projected average annual payroll growth based on these projections.

Projected Overall Payroll Growth over Next 20 Years				
All values are per year	State Employees	Teachers	MERS General	MERS P&F
Current Assumption	3.75%	3.75%	3.75%	3.75%
Projected Payroll Growth based on analysis	3.02%	2.77%	3.19%	3.41%
Proposed Assumption	3.25%	3.00%	3.25%	3.50%

Based on this analysis, we found that payroll over the next twenty years was projected to increase less than 3.50% for all groups (except perhaps MERS P&F). For Teachers, this was even more pronounced, being 0.25% less than the State Employee group. Therefore we are recommending setting this assumption at 3.25% for State Employees and MERS General. For Teachers, we are recommending a 3.00% per year assumption. For MERS P&F, we are recommending lowering from 3.75% to 3.50%. This change is consistent with the change to the overall wage inflation rate.

This change has no impact on the liabilities of the System, but does impact the contribution rates because it is used to project out future payrolls that will be the basis of future contributions. By assuming there will be less payroll in the future to make contributions on, the contribution rate must increase to reproduce the appropriate amount of dollars into the fund. This change and the change to the assumed salary increases for individual members largely offset each other.

Post-retirement mortality rates (service retirees)

The longer retirees live and receive their benefits, the larger the liability of the plan, thus increasing the contributions necessary to fund the plan.

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When choosing an appropriate mortality assumption, actuaries typically use standard mortality tables, unlike when choosing other demographic assumptions. They may choose to adjust these standard mortality tables, however, to reflect various characteristics of the covered group, and to provide for expectations of future mortality improvement (both up to and after the measurement date). If the plan population has sufficient credibility to justify its own mortality table, then the use of such a table also could be appropriate. Factors that may be considered in selecting and/or adjusting a mortality table include the demographics of the covered group, the size of the group and the statistical credibility of its experience, and future mortality improvement.

We first measured the credibility of the dataset to determine whether the standard, unadjusted tables should be used or if statistical analysis of ERSRI specific data was warranted. Based on an example shown in a practice note issued by the American Academy of Actuaries in the fall of 2011, a dataset needs 96 expected deaths for each gender to be declared fully credible with 95% confidence. Other sources state higher requirements, such as 1,000 deaths per gender, if higher levels of confidence or a tighter range are desired. Based on the number of deaths in this analysis, we have used the data as if it is fully credible and an ERSRI specific assumption is appropriate.

We use separate mortality tables for Teachers and all other employees. Life expectancy for Teachers is on average longer than for other state and local government employees. We currently include Public Safety employees in the All Other Employee category. While historically, retirees from Public Safety occupations had a lower life expectancy than the general population, most recent data sources do not show a statistical difference between Public Safety retirees and the general population. In fact, if recent trends continue, it is likely today's 40 year old Public Safety employee will have a longer life expectancy once they retire than today's general employee. The largest data set to confirm this trend is the most recent experience study produced by the Staff Actuaries at the California Public Employees' Retirement System (CALPERS). The life expectancy in years from a given age was higher for all Public Safety classifications that the general population. The following table is from the report, which can be found here: http://www.calpers.ca.gov/eip-docs/about/pubs/employer/experience-study.pdf.

Expected Age at Death (In Years) For Service Retirements, Males

Current Age	General Employees	All Safety Members	Firefighters	Police Officers	County Peace Officers
50	80.1	81.4	81.7	82.0	81.1
55	81.1	81.8	82.1	82.3	81.5
60	81.9	82.4	82.7	82.7	82.0
65	83.0	83.2	83.5	83.4	82.9

This has been confirmed by several other studies of large populations produced by various actuaries, including ourselves. The data used directly in this experience study is not statistically credible for measuring the Public Safety retirees separately, and thus we are utilizing these other reports to support not to distinguish between retirees from a Public Safety position and Other Municipal Employees in our mortality assumptions.

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Of course, we also use separate tables for males and females. Separate tables discussed in the following section are used for disabled retirees.

The current base assumptions are summarized below, and then projected forward based on Scale AA:

- For nondisabled retirees (State Employees and MERS): the RP-2000 Combined mortality table with white collar adjustment for males and females
  - o With the male rates multiplied by 115%
  - o With the female rates multiplied by 95%
- For nondisabled retired Teachers: the same GRS teacher mortality tables for males and females currently being used,
  - o With male rates multiplied by 97%
  - o With female rates multiplied by 92%

To analyze the data, we began by determining the expected number of deaths in each year at each age for males and females. The analysis uses only the retirees, not the beneficiaries, joint annuitants, or survivors. For this one analysis, we also grouped the retired State Employees with retirees in MERS, because the results were similar, and combining the groups gave us more data, giving us more confidence in the results.

Next we compared the actual number to the expected number. The ratio of the actual deaths to the expected deaths—the A/E ratio—tells us whether the assumptions are reasonable. 100% in aggregate might indicate a match between the assumption and experience. We also examined the results in five-year age groups, checking how well the pattern in the table matched actual experience. A summary of the results of this analysis are shown below:

Group	Other Employees		Teachers		Total
Gender	Males	Females	Males	Females	
Number of actual deaths	1,398	1,483	420	632	3,933
Number of expected deaths (under current assumptions)	1,404	1,426	401	627	3,858
A/E ratio (current)	100%	104%	105%	101%	102%
Life Expectancy of 65 year old retiree in years (actual)	17.8	21.3	20.7	23.5	
Life Expectancy of 65 year old retiree in years (expected)	18.2	21.6	20.7	23.4	
A/E ratio	102.1%	101.5%	100.0%	99.3%	

More detail is shown on the tables in Section VII. See pages 58-61. Based on these results, we are recommending no change to the current post-retirement mortality assumptions.

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Because of this assumption of continuous improvement, life expectancies for today's younger active members are expected to be materially longer than those of today's retirees, and this has a significant impact on costs and liabilities.

The base year for both tables is 2000. That is, improvement is projected from that year to each year in the future. In setting the multipliers in the base tables, we compared the base tables, projected to 2010, roughly the midpoint of the experience study data, with actual deaths. This is what is shown in the detailed tables in Section VII, pages 58-61. As you can see from these tables, the current tables produce an A/E ratio, before projection into the future, of about or just over 100%, which is the ideal range.

Post-retirement mortality rates (disabled retirees)

This is a relatively minor assumption, and it has little impact on the liabilities of ERSRI. Because of the small numbers of disabled retirees and disabled deaths, we combined all the ERSRI and MERS disabled lives for our analysis. There were a total of 290 disabled deaths during the analysis period, compared to 271 expected deaths. The A/E ratio was 104% for males and 111% for females, and combining the genders gives a unisex A/E of 107%, which allows some margin for future improvement in longevity. We recommend no change to this assumption.

Active mortality rates

Currently, for active mortality, we apply a multiplier (currently 50% for Teachers and 75% for all other employees) to the underlying table used for post-retirement mortality. Similar to experience in other plans we work with, using the retiree mortality assumption without adjustments projects slightly more deaths during employment than actually occur. We are recommending no change to these current assumptions.

Details are shown in Section VII on pages 64-67.

Disability rates

We analyzed disability separately for males and females, State Employees, Teachers, MERS General and MERS P&F, and ordinary and accidental disability.

We compared the number of actual and expected disabilities by group, taking into account the fact that members with less than five years of service and members eligible for retirement are not eligible for ordinary disability.

For disability, there is often a lag time between when the member leaves active service to when the member is approved for disability. In many cases, this timeframe can span over a valuation cycle, meaning a member is active in year 1, shows as an inactive in year 2, and then a disabled member in year 3. We have used the actual disabled records in the 2013 valuation data for members with dates of disability in the six-year period January 1, 2006 through December 31, 2011 as an approximation of our actual disabilities as the FY13 experience likely doesn't completely include members who are in processing as of June 30, 2013.

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For this assumption, an A/E close to, but less than, 100% is preferable. The analysis shows a reasonably close match across the groups, given the relatively small numbers. We have made recommendations on a few of the groups, and for those have provided the A/E ratio based on the proposed assumptions. For most groups, the size is too small to give full credibility so in most cases the recommended assumption only partially reflect the recent experience. Although there are detailed tables on each of the groups in Section VII, here are tables showing some summary information:

State Employees				
Group/Type	Actual Number	Expected Number	A/E Ratio	A/E on Proposed Assumption
State male ordinary	35	48	73%	85%
State female ordinary	68	73	93%	
State male accidental	36	32	113%	100%
State female accidental	44	21	210%	142%
Teacher male ordinary	23	17	135%	105%
Teacher female ordinary	59	62	95%	
Teacher male accidental	2	3	67%	
Teacher female accidental	8	13	62%	
MERS General male ordinary	31	39	79%	86%
MERS General female ordinary	24	27	107%	
MERS General male accidental	15	24	63%	83%
MERS General female accidental	7	12	58%	70%
MERS P&F ordinary	3	8	38%	75%
MERS P&F accidental	39	37	105%	105%
Total disabilities	394	416	95%	96%

These changes will have a minor impact on the liabilities and contribution requirements. Details are shown in Section VII on pages 68-81.

Retirement pattern

The retirement rates are only applied to members eligible for retirement. Separate rates are set for males and females, and by occupation. Currently, the rates for retirement prior to age 60 are indexed to the member's service, and rates for retirement at or after age 60 are indexed to the member's age. (In other words, there is a rate of retirement that applies to a member at 62, regardless of service.)

Due to the passage of several Articles over the past few years which impacted the benefit provisions of the retirement system and the retiree medical benefits, the experience from this analysis period is likely to not represent a reasonable comparison for future retirement patterns. We have completed the analysis, but are not recommending changes to the overall expectations at this time based on the results.

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However, we are recommending a significantly more simple approach to applying this pattern for State Employees, Teachers, and MERS General.   Now that members will all have a retirement age equal to their Social Security Normal Retirement Age, or RIRSA date, the complexities based on service, etc. are not needed. We are recommending a flat 25% per year retirement probability for members eligible for unreduced retirement.   If the first year a member is eligible for unreduced retirement (their SSNRA or RIRSA date) they have more than 25 years of service or are at least age 65, we will add an additional 25% probability (50% total) for General Employees and 35% (60% total) for Teachers. This simplified pattern produces liabilities and contribution requirements similar to the current pattern.

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, whether the member is vested or non-vested, and whether the member takes a refund or keeps his/her account balance on deposit and takes a deferred benefit.

We use separate termination rates for males and females and for all four groups. The current rates are structured as a function of service. No terminations are assumed once a member becomes eligible for retirement. The current tables were based on ERSRI experience and developed in prior experience studies. For this analysis, we have used data from the prior experience study and extended the experience period to ten years as termination patterns tend to be very cyclical with the overall economy.

Our analysis showed very little statistical difference between males and females in the specific groups, so we are recommending unisex tables.

Our analysis showed that State Employees, MERS General, and especially Teachers had more actual terminations than expected based on current assumptions. However, we believe the recent downturn in the economy has impacted these results, and therefore, we are only recommending changes that remove approximately half of the margin at this time. For MERS P&F, there were far fewer terminations than expected and we have lowered the assumption accordingly. However, this assumption is minor for P&F units.   The tables below provide detail on the analysis.

Termination Experience – All Data				
	State Employees	Teachers	MERS General	MERS P&F
Actual number	4,209	4,381	3,284	234
Expected number	4,071	3,587	2,993	312
A/E ratio (Current)	103%	122%	110%	75%
A/E ratio (Proposed)	100%	111%	104%	100%

(An A/E ratio above 100% is conservative.)

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Termination Experience – Members with more than 10 Years of Service				
	State Employees	Teachers	MERS General	MERS P&F
Actual number	1,135	902	550	42
Expected number	1,049	768	478	50
A/E ratio (Current)	108%	118%	115%	84%
A/E ratio (Proposed)	101%	114%	110%	120%

You can see the full detail in the tables in Section VII, on pages 82-85.

Spousal age difference

Currently, we assume that male members are three years older than their spouses and female members are three years younger than their spouses. This is reasonable, based on general census statistics and we are not recommending changing this assumption.

Refund of contributions

We currently assume that members who are vested and terminate in the future will choose the more valuable of a refund or a deferred annuity. This is a bit conservative, since some people do choose a refund when the deferred benefit is worth more, but we are recommending no change in this assumption.

Other assumptions

There are other technical assumptions made in the course of a valuation, such as the timing of terminations and retirements during the year, and the timing of pay increases. We reviewed these and are recommending no changes.

Actuarial cost method

The individual Entry Age Normal cost method (EAN) is the current funding method being used to allocate the actuarial costs of the Fund. Under this method, the normal cost for each member is determined to be the level percentage of payroll which, if contributed from the date of entry to the date of retirement, would accumulate assets sufficient to pay the retirement benefits when due. Use of this method is required by statute. The Entry Age Normal method will generally produce relatively level contribution amounts as a percentage of payroll from year to year, and allocates costs among various generations of taxpayers in a reasonable fashion. It is by far the most commonly used actuarial cost method for large public retirement systems. We continue to believe this is the best funding method for ERSRI and recommend no change.

Actuarial Value of Assets

Actuaries generally recommend using a smoothed actuarial value of assets (AVA), rather than market value (MVA), in order to dampen the fluctuations in measurements such as the required contribution amount and the funded status of the system.

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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. For example, if the actual return is 12.50% in one year, then currently 7.50% is reflected immediately in the AVA, and the other 5.00% is recognized in 20% increments over five years, beginning with 20% for the current year.

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. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continuing to be recognized on their original timeframe. 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). The returns are computed net of administrative and investment expenses.

During a prior experience study, we discussed whether or not a "corridor" should be added, restricting the AVA to no more than 120% of the market value and no less than 80% of the market value. We noted that this would ensure that the AVA and MVA were always somewhat close together, but would increase volatility. After a discussion, the Board decided to retain the current approach, without incorporating a corridor, because of concerns about volatility. We continue to believe that is a reasonable position to have taken, and recommend no changes.

Amortization period

The unfunded actuarial accrued liability is being amortized over a closed 25-year period from June 30, 2010. The current amortization period is 22 years. New gains and losses will be "laddered" on individual 20 year bases once the period on the large base decreases below 20. We are not recommending any change to this in connection with the current experience study.

SECTION IV
ACTUARIAL IMPACT OF RECOMMENDATIONS

Section IV
Impact of Proposed Changes to Actuarial Assumptions

Under Rhode Island General Laws, the employer contribution rates are certified annually by the State of Rhode Island Retirement Board. These rates are 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 Board's current policy is that the contribution rates determined by a given actuarial valuation become effective two years after the valuation date. For example, the rates determined by the June 30, 2014 actuarial valuation will be applicable for the year beginning July 1, 2016 and ending June 30, 2017.

The actuarial cost method and the amortization period are set by statute. Contribution rates and liabilities are computed using the Entry Age Normal 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 closed period (21 years as of June 30, 2014). The amortization rate is adjusted for the two-year deferral in contribution rates. Separate employer contribution rates are determined for State Employees, Teachers, Judges, State Police, and individual MERS units.

Effect of the proposed assumptions

We are not recommending the June 30, 2013 valuation be reinstated, but instead, these recommended assumptions be used in this upcoming June 30, 2014 valuation. Shown below is a table that compares key results from the June 30, 2013 actuarial valuation with these same results recalculated using the recommended actuarial assumptions and methods. As you can see, the assumption changes have minimal impact on the contribution requirements and liabilities.

State Employees			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/ Decrease
Normal cost	9.06%	8.69%	-0.37%
Unfunded actuarial accrued liability	$1,879 million	$1,855 million	-$24 million
Funded ratio	56.2%	56.5%	+0.3%
Illustrated FY 2016 Annual Required Contribution			
a. Percent of payroll	23.65%	24.01%	+0.36%
b. Projected Payroll	$718 million	$708 million	-$10 million
c. Estimated dollar amount	$169.9 million	$170.0 million	+$0.1 million

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Teachers			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/ Decrease
Normal cost	8.37%	7.77%	-0.60%
Unfunded actuarial accrued liability	$2,666 million	$2,568 million	-$98 million
Funded ratio	58.1%	59.0%	+0.9%
Illustrated FY 2016 Annual Required Contribution			
a. Percent of payroll	23.13%	23.20%	+0.07%
b. Projected Payroll	$1,044 million	$1,022 million	-$22 million
c. Estimated dollar amount	$241.6 million	$237.2 million	-$4.4 million

All MERS Units in Aggregate			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/ Decrease
Normal cost	11.63%	11.55%	-0.08%
Unfunded actuarial accrued liability	$277 million	$273 million	-$4 million
Funded ratio	82.1%	82.3%	+0.2%
Illustrated FY 2016 Annual Required Contribution			
a. Percent of payroll	13.91%	13.95%	+0.04%
b. Projected Payroll	$346 million	$341 million	-$5 million
c. Estimated dollar amount	$48.2 million	$47.8 million	-$0.4 million

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Judges			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/ Decrease
Normal cost	33.71%	32.23%	-1.48%
Unfunded actuarial accrued liability	$7.5 million	$6.8 million	-$0.7 million
Funded ratio	86.5%	87.5%	+1.0%
Illustrated FY 2016 Annual Required Contribution			
a. Percent of payroll	26.80%	24.83%	-1.97%
b. Projected Payroll	$10.1 million	$10.0 million	-$0.1 million
c. Estimated dollar amount	$2.7 million	$2.4 million	-$0.3 million

State Police			
Item	Current Assumptions and Methods	Recommended Assumptions and Methods	Increase/ Decrease
Normal cost	22.73%	22.22%	-0.51%
Unfunded actuarial accrued liability	$9.3 million	$9.0 million	-$0.3 million
Funded ratio	90.9%	91.2%	+0.3%
Illustrated FY 2016 Annual Required Contribution			
a. Percent of payroll	17.22%	16.58%	-0.64%
b. Projected Payroll	$21.5 million	$21.4 million	-$0.1 million
c. Estimated dollar amount	$3.7 million	$3.6 million	-$0.1 million

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Municipal Employees Retirement System (Defined Benefit Contributions Only)
Based on the June 30, 2013 Actuarial Valuation Data

	Contribution Rate			UAAL			Funded Ratio		
Unit	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Bristol	14.75%	14.95%	-0.20%	5,556,907	5,636,795	(79,888)	73.7%	73.4%	0.3%
Burrillville	8.52%	8.52%	0.00%	761,582	554,123	207,459	97.0%	97.8%	-0.8%
Central Falls	13.61%	13.62%	-0.01%	2,163,809	2,181,562	(17,753)	69.2%	69.0%	0.2%
Charlestown	9.57%	9.86%	-0.29%	838,329	885,039	(46,710)	87.1%	86.5%	0.6%
Cranston	9.81%	9.86%	-0.05%	6,773,510	6,510,758	262,752	94.9%	95.1%	-0.2%
Cumberland	13.72%	13.64%	0.08%	7,606,316	7,570,813	35,503	73.5%	73.6%	-0.1%
East Greenwich	4.71%	5.31%	-0.60%	(1,069,568)	(1,020,549)	(49,019)	116.7%	115.8%	0.9%
East Providence	25.85%	25.19%	0.66%	41,025,235	40,988,292	36,943	59.1%	59.1%	0.0%
West Greenwich	12.86%	12.36%	0.50%	1,799,028	1,637,978	161,050	81.5%	82.9%	-1.4%
Foster	12.18%	11.83%	0.35%	649,837	598,266	51,571	82.6%	83.8%	-1.2%
Glocester	9.95%	9.77%	0.18%	902,498	814,630	87,868	89.2%	90.2%	-0.9%
Hopkinton	4.47%	4.77%	-0.30%	(676,351)	(684,605)	8,254	117.3%	117.5%	-0.2%
Jamestown	10.36%	10.69%	-0.33%	1,796,785	1,865,123	(68,338)	85.8%	85.3%	0.5%
Johnston	16.30%	16.09%	0.21%	10,551,205	10,502,266	48,939	73.5%	73.6%	-0.1%
Lincoln	12.30%	12.70%	-0.40%	587,170	614,059	(26,889)	70.7%	69.8%	0.9%
Middletown	10.58%	10.82%	-0.24%	3,441,146	3,492,278	(51,132)	81.7%	81.5%	0.2%
Newport	22.49%	21.86%	0.63%	24,944,573	24,742,841	201,732	63.8%	64.0%	-0.2%
New Shoreham	8.20%	8.01%	0.19%	229,621	184,062	45,559	96.2%	96.9%	-0.7%
North Kingstown	17.85%	17.44%	0.41%	15,459,778	15,283,876	175,902	73.4%	73.6%	-0.2%
North Providence	6.29%	6.82%	-0.53%	(960,202)	(831,309)	(128,893)	103.7%	103.2%	0.5%
North Smithfield	6.07%	6.44%	-0.37%	(780,500)	(817,519)	37,019	106.3%	106.6%	-0.3%
Pawtucket	16.85%	16.91%	-0.06%	27,084,310	27,549,703	(465,393)	76.2%	75.9%	0.3%
Union Fire District	7.93%	7.74%	0.19%	38,875	28,838	10,037	93.3%	94.9%	-1.7%
Richmond	10.07%	10.00%	0.07%	385,067	375,570	9,497	82.0%	82.4%	-0.4%
Scituate	14.84%	14.71%	0.13%	2,841,218	2,888,445	(47,227)	77.4%	77.1%	0.3%
Smithfield	8.23%	8.47%	-0.24%	277,593	248,581	29,012	97.7%	97.9%	-0.2%
South Kingstown	11.46%	11.25%	0.21%	6,499,487	6,072,771	426,716	87.8%	88.5%	-0.7%
Tiverton	3.03%	3.19%	-0.16%	(2,039,139)	(2,058,381)	19,242	120.8%	121.0%	-0.2%
Warren	12.40%	12.68%	-0.28%	1,853,849	1,904,597	(50,748)	71.3%	70.8%	0.6%
Westerly	87.84%	82.86%	4.98%	791,973	786,885	5,088	16.4%	16.5%	-0.1%
West Greenwich	16.14%	16.50%	-0.36%	1,304,023	1,343,766	(39,743)	64.0%	63.3%	0.7%

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Municipal Employees Retirement System (Defined Benefit Contributions Only)
Based on the June 30, 2013 Actuarial Valuation Data

Unit	Contribution Rate			UAAL			Funded Ratio		
	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Woonsocket	10.19%	10.27%	-0.08%	4,161,486	4,055,652	105,834	93.4%	93.6%	-0.2%
Chariho School District	10.54%	10.73%	-0.19%	2,868,467	2,834,255	34,212	84.1%	84.3%	-0.2%
Foster/Glocester	11.74%	11.75%	-0.01%	972,975	945,464	27,511	85.3%	85.7%	-0.4%
Tiogue Fire & Lighting	0.00%	0.00%	0.00%	(20,541)	(20,541)	-	184.0%	184.0%	0.0%
Narragansett Housing	4.86%	5.71%	-0.85%	(41,029)	(35,849)	(5,180)	110.2%	108.8%	1.4%
Coventry Lighting District	0.00%	0.00%	0.00%	(366,435)	(366,951)	516	144.6%	144.7%	-0.1%
Hope Valley Fire	2.26%	2.83%	-0.57%	(115,818)	(115,327)	(491)	129.4%	129.2%	0.2%
East Greenwich Housing	9.92%	10.22%	-0.30%	122,307	130,438	(8,131)	90.2%	89.7%	0.6%
Cranston Housing	7.83%	7.45%	0.38%	(289,586)	(359,071)	69,485	107.1%	108.9%	-1.8%
East Providence Housing	11.51%	11.54%	-0.03%	376,806	371,527	5,279	87.7%	87.8%	-0.2%
Pawtucket Housing	0.00%	0.00%	0.00%	(3,828,386)	(3,737,896)	(90,490)	143.5%	142.1%	1.5%
Cumberland Housing	7.10%	7.36%	-0.26%	46,993	45,111	1,882	96.2%	96.4%	-0.1%
Lincoln Housing	15.85%	15.90%	-0.05%	556,767	562,643	(5,876)	73.3%	73.1%	0.2%
Bristol Housing	0.00%	0.00%	0.00%	(522,187)	(551,093)	28,906	137.5%	140.5%	-2.9%
Burrillville Housing	7.94%	7.58%	0.36%	57,094	39,895	17,199	93.9%	95.7%	-1.8%
North Providence Housing	29.33%	27.46%	1.87%	785,465	763,959	21,506	50.3%	50.9%	-0.7%
East Smithfield Water	1.45%	2.19%	-0.74%	(144,375)	(123,391)	(20,984)	118.9%	115.7%	3.2%
Greenville Water	0.84%	1.96%	-1.12%	(239,524)	(231,592)	(7,932)	128.3%	127.1%	1.2%
Newport Housing	18.60%	18.33%	0.27%	2,387,633	2,386,377	1,256	72.0%	72.0%	0.0%
Warren Housing	5.92%	6.03%	-0.11%	(85,640)	(89,883)	4,243	107.4%	107.8%	-0.4%
Johnston Housing	11.27%	11.52%	-0.25%	219,197	223,247	(4,050)	83.3%	83.0%	0.3%
Tiverton Local 2670A	8.72%	8.52%	0.20%	167,466	154,104	13,362	95.6%	95.9%	-0.3%
Barrington COLA	8.08%	8.48%	-0.40%	837,285	933,283	(95,998)	97.3%	97.0%	0.3%
Coventry Housing	10.21%	10.79%	-0.58%	232,663	257,683	(25,020)	80.4%	78.7%	1.7%
South Kingstown Housing	2.51%	2.59%	-0.08%	(127,574)	(130,584)	3,010	168.3%	171.1%	-2.8%
N. RI Collaborative Adm. Services	8.29%	8.94%	-0.65%	192,461	215,686	(23,225)	93.1%	92.3%	0.8%
West Warwick Housing	9.74%	9.42%	0.32%	183,550	165,220	18,330	89.4%	90.3%	-1.0%
Smithfield Housing	1.33%	2.26%	-0.93%	(97,679)	(95,497)	(2,182)	134.6%	133.6%	1.0%
Smithfield COLA	9.17%	9.73%	-0.56%	1,219,222	1,329,382	(110,160)	91.3%	90.6%	0.7%
Central Falls Housing	10.41%	11.14%	-0.73%	663,128	710,673	(47,545)	74.4%	73.0%	1.3%
Lime Rock Administrative Services	14.28%	13.25%	1.03%	91,149	82,809	8,340	73.3%	75.1%	-1.8%
Central Falls Schools	7.73%	8.00%	-0.27%	648,846	594,892	53,954	95.4%	95.7%	-0.4%

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Municipal Employees Retirement System (Defined Benefit Contributions Only)
Based on the June 30, 2013 Actuarial Valuation Data

	Contribution Rate			UAAL			Funded Ratio		
Unit	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Bristol/Warren Schools	18.13%	17.37%	0.76%	6,524,998	6,322,394	202,604	69.8%	70.5%	-0.7%
Town of E. Greenwich-COLA-NCE	4.71%	5.31%	-0.60%	(1,150,913)	(1,113,652)	(37,261)	106.4%	106.2%	0.2%
Harrisville Fire District (ADMIN)	6.06%	7.62%	-1.56%	(21,643)	1,054	(22,697)	104.1%	99.8%	4.2%
Albion Fire District (ADMIN)	0.00%	0.00%	0.00%	(7,255)	(7,255)	-	89.7%	107.3%	-17.7%
General Employee Units Average	12.77%	12.74%	0.02%	176,895,338	176,037,087	858,250	83.2%	83.3%	-0.1%
Johnston Fire	9.12%	9.24%	-0.12%	93,870	224,989	(131,119)	97.8%	94.8%	3.0%
Richmond Police	12.08%	12.37%	-0.29%	364,010	415,901	(51,891)	76.4%	74.0%	2.5%
Smithfield Police	6.61%	6.93%	-0.32%	(841,863)	(666,243)	(175,620)	108.3%	106.4%	1.8%
Valley Falls Fire	16.68%	16.65%	0.03%	919,540	956,834	(37,294)	76.9%	76.1%	0.7%
North Smithfield Voluntary Fire	17.37%	17.15%	0.22%	1,207,573	1,255,793	(48,220)	82.9%	82.4%	0.6%
East Greenwich Fire	26.90%	26.48%	0.42%	6,062,953	6,171,653	(108,700)	62.8%	62.4%	0.4%
East Greenwich Police	28.35%	27.93%	0.42%	5,315,817	5,410,860	(95,043)	70.5%	70.2%	0.4%
North Kingstown Fire	30.52%	30.04%	0.48%	11,734,109	11,947,908	(213,799)	69.7%	69.3%	0.4%
North Kingstown Police	25.73%	25.44%	0.29%	7,346,412	7,511,162	(164,750)	70.4%	70.0%	0.5%
North Providence Fire	23.88%	23.56%	0.32%	10,956,474	11,190,487	(234,013)	72.0%	71.6%	0.4%
Barrington Fire (25)	8.84%	9.02%	-0.18%	141,536	197,288	(55,752)	92.4%	89.7%	2.7%
Barrington Police	30.21%	29.80%	0.41%	4,626,194	4,709,402	(83,208)	61.7%	61.2%	0.4%
Barrington Fire (20)	92.06%	89.59%	2.47%	2,602,855	2,606,988	(4,133)	73.2%	73.2%	0.0%
Warren Police & Fire	28.25%	27.86%	0.39%	4,231,728	4,313,972	(82,244)	66.4%	66.0%	0.4%
South Kingstown Police	25.01%	24.71%	0.30%	6,324,703	6,484,929	(160,226)	76.3%	75.9%	0.5%
Scituate Police	0.00%	0.00%	0.00%	(161,797)	(161,797)	-	838.9%	838.9%	0.0%
North Smithfield Police	22.01%	21.79%	0.22%	2,380,443	2,440,310	(59,867)	77.5%	77.1%	0.4%
Tiverton Fire	14.09%	14.13%	-0.04%	1,387,200	1,478,747	(91,547)	86.6%	85.9%	0.8%
Foster Police	33.20%	32.58%	0.62%	1,266,762	1,277,398	(10,636)	66.2%	66.0%	0.2%
Woonsocket Police	26.45%	26.08%	0.37%	13,388,741	13,632,522	(243,781)	70.4%	70.0%	0.4%
Charlestown Police	23.70%	23.45%	0.25%	2,868,571	2,946,724	(78,153)	71.9%	71.4%	0.5%
Hopkinton Police	29.83%	29.40%	0.43%	2,369,204	2,409,193	(39,989)	68.2%	67.8%	0.4%
Glocester Police	18.00%	17.89%	0.11%	1,172,740	1,224,897	(52,157)	81.2%	80.5%	0.7%
West Greenwich Police/Rescue	22.73%	22.45%	0.28%	1,326,593	1,361,350	(34,757)	70.2%	69.7%	0.5%

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Municipal Employees Retirement System (Defined Benefit Contributions Only)
Based on the June 30, 2013 Actuarial Valuation Data

Unit	Contribution Rate			UAAL			Funded Ratio		
	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease	Recommended Assumptions	Current Assumptions	Increase/ Decrease
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Burrillville Police	25.96%	25.65%	0.31%	2,415,878	2,475,707	(59,829)	77.4%	77.0%	0.4%
Cumberland Rescue	11.07%	11.12%	-0.05%	105,984	162,343	(56,359)	97.8%	96.7%	1.1%
Woonsocket Fire	11.18%	11.28%	-0.10%	1,515,434	1,902,954	(387,520)	96.0%	95.0%	1.0%
Bristol Fire	25.58%	24.92%	0.66%	74,302	75,600	(1,298)	76.6%	76.2%	0.3%
Cumberland Hill Fire	28.83%	28.57%	0.26%	1,895,977	1,935,830	(39,853)	66.5%	66.1%	0.5%
Bristol Police	5.55%	5.84%	-0.29%	(953,529)	(827,403)	(126,126)	124.6%	120.7%	3.9%
Coventry Fire	21.65%	21.46%	0.19%	1,792,009	1,838,505	(46,496)	63.0%	62.4%	0.6%
South Kingstown EMT	5.14%	5.34%	-0.20%	(497,347)	(456,398)	(40,949)	118.7%	116.9%	1.8%
North Cumberland	21.34%	21.05%	0.29%	1,059,692	1,093,534	(33,842)	78.7%	78.2%	0.5%
Central Coventry Fire	16.68%	16.52%	0.16%	2,761,952	2,881,405	(119,453)	74.7%	73.9%	0.8%
Hopkins Hill Fire	14.01%	13.92%	0.09%	173,959	200,820	(26,861)	90.8%	89.6%	1.3%
Cranston Police	9.53%	9.82%	-0.29%	511,641	1,128,480	(616,839)	98.1%	95.9%	2.2%
Cranston Fire	7.91%	8.15%	-0.24%	(3,563,559)	(2,932,690)	(630,869)	108.9%	107.2%	1.7%
Cumberland Fire	23.67%	23.37%	0.30%	1,231,946	1,267,643	(35,697)	73.2%	72.6%	0.6%
Lincoln Rescue	18.26%	18.07%	0.19%	1,280,507	1,319,355	(38,848)	67.9%	67.3%	0.7%
New Shoreham Police	23.77%	23.45%	0.32%	482,828	493,130	(10,302)	66.7%	66.3%	0.5%
Middletown Police & Fire	6.30%	6.40%	-0.10%	(999,974)	(892,073)	(107,901)	135.6%	130.6%	5.0%
Harrisville Fire District	7.80%	7.87%	-0.07%	(104,268)	(91,237)	(13,031)	111.5%	109.9%	1.6%
Albion Fire District	17.58%	17.45%	0.13%	255,294	266,152	(10,858)	69.7%	68.9%	0.9%
Johnston Police	9.10%	8.98%	0.12%	9,594	12,216	(2,622)	90.3%	88.0%	2.3%
Smithfield Fire	10.52%	10.31%	0.21%	29,612	32,979	(3,367)	95.0%	94.4%	0.5%
Police & Fire Units Average	16.96%	16.89%	0.07%	96,562,298	101,228,117	(4,665,819)	80.6%	79.8%	0.8%
All MERS Units Average	13.95%	13.91%	0.03%	273,457,636	277,265,205	(3,807,569)	82.3%	82.1%	0.2%

The figures above were calculated as of June 30, 2013, using the same benefit provisions and the same member and financial data that were being used to prepare the regular June 30, 2013 actuarial valuation report. We are not recommending the June 30, 2013 valuation be reinstated, but instead, these recommended assumptions be used in this upcoming June 30, 2014 valuation.

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SECTION V
SUMMARY OF RECOMMENDATIONS

Section V
Summary of Recommendations

Our recommendations for changes in the assumptions may be summarized as follows:

1. Decrease the productivity component of the salary scale assumption by 0.50%, from 1.25% to 0.75% above inflation for State Employees, Teachers, General MERS and for Judges and from 1.50% to 1.25% above inflation for MERS P&F and State Police.

2. In conjunction with the reduced wage inflation assumptions, reduce the payroll growth rate assumption from 3.75% to 3.25% for State Employees and General MERS, from 3.75% to 3.00% for Teachers; from 3.75% to 3.50% for MERS P&F, from 4.00% to 3.50% for Judges, and from 4.00% to 3.75% for State Police.

3. Make slight changes to the rates of disability for several groups.

4. Change the structure of the retirement rates for State Employees, Teachers, and MERS General to a more simplified approach that approximates the future patterns of retirements.

5. Increase the rates of termination for all groups except MERS P&F. Decrease the rates for MERS P&F.

SECTION VI

SUMMARY OF ASSUMPTIONS AND METHODS INCORPORATING THE RECOMMENDED ASSUMPTIONS

Section VI
Summary of Assumptions and Methods
Incorporating the Recommended Assumptions

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 actuarial valuation uses the Entry Age actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) a rate that will amortize the unfunded actuarial accrued liability (UAAL).

1.   First, the actuarial present value of future benefits is determined by discounting the projected benefits for each member back to the valuation date using the assumed investment return rate as the discount rate. For active members, the projected benefits are based on the member's age, service, gender and compensation, and based on the actuarial assumptions. The calculations take into account the probability of the member's death, disability, or termination of employment prior to becoming eligible for a retirement benefit, as well as the possibility of the member will remain in service and receive a service retirement benefit. Future salary increases are anticipated. The present value of the expected benefits payable to all active members is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits. Liabilities for future members are not included.

2.   The employer contributions required to support the benefits are determined as a level percentage of salary, and consist of a normal contribution and an amortization contribution.

3.   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.

4.   The employer normal cost rate is equal to (i) the normal cost rate, minus (ii) the member contribution rate.

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5.   The actuarial accrued liability is equal to the present value of all benefits less the present value of future normal costs. The unfunded actuarial accrued liability (UAAL) is then determined as (i) the actuarial accrued liability, minus (ii) the actuarial value of assets.

6.   The amortization contribution rate is the level percentage of payroll required to reduce the UAAL to zero over the remaining amortization period. The UAAL was initially being amortized over the remainder of a closed 30-year period from June 30, 1999. In conjunction with The Rhode Island Retirement Security Act of 2011, the amortization period was reset to 25 years as of June 30, 2010. The employer contribution rate determined by this valuation will not be effective until two years after the valuation date. The determination of the contribution rate reflects this deferral. The unfunded actuarial accrued liability (UAAL) and covered payroll are projected forward for two years, and we then determine the amortization charge required to amortize the UAAL over the remaining amortization period from that point. In projecting the UAAL, we increase the UAAL for interest at the assumed rate and we decrease it for the amortization payments. The amortization payments for these two years are determined by subtracting the current employer normal cost from the known contribution rates for these years, based on the two prior actuarial valuations. Contributions are assumed to be made monthly throughout the year.

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. Offsetting unrecognized gains and losses are immediately recognized, with the shortest remaining bases recognized first and the net remaining bases continue to be recognized on their original timeframe. 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). The returns are computed net of administrative and investment expenses.

IV.   Actuarial Assumptions

A.   Economic Assumptions

1.   Investment return: 7.50% per year, compounded annually, composed of an assumed 2.75% inflation rate and a 4.75% net real rate of return. This rate represents the assumed return, net of all investment and administrative expenses.

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2.   Salary increase rate:

For MERS P&F: The sum of (i) a 4.00% wage inflation assumption (composed of a 2.75% price inflation assumption and a 1.25% additional general increase), and (ii) a service-related component as shown below:

MERS P&F		
Years of Service	Service-Related Component	Total Increase
1	10.00%	14.00%
2	9.00	13.00
3	7.00	11.00
4	4.00	8.00
5	2.50	6.50
6	3.00	7.00
7	0.50	4.50
8	0.50	4.50
9 or more	0.00	4.00

For State Employees, Teachers and MERS General: The sum of (i) a 3.50% wage inflation assumption (composed of a 2.75% price inflation assumption and a 0.75% additional general increase), and (ii) a service-related component as shown on next page.

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	State Employees		Teachers		MERS General	

Service	State Employees Service-Related Component	Total Increase	Teachers Service-Related Component	Total Increase	MERS General Service-Related Component	Total Increase
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	3.00%	6.50%	10.00%	13.50%	4.00%	7.50%
2	3.00%	6.50%	9.00%	12.50%	3.00%	6.50%
3	2.75%	6.25%	6.25%	9.75%	2.75%	6.25%
4	2.75%	6.25%	5.50%	9.00%	2.50%	6.00%
5	2.75%	6.25%	5.00%	8.50%	2.25%	5.75%
6	2.75%	6.25%	5.00%	8.50%	2.00%	5.50%
7	1.25%	4.75%	4.50%	8.00%	1.25%	4.75%
8	1.00%	4.50%	4.25%	7.75%	0.75%	4.25%
9	1.00%	4.50%	4.00%	7.50%	0.50%	4.00%
10	1.00%	4.50%	4.00%	7.50%	0.50%	4.00%
11	1.00%	4.50%	0.00%	3.50%	0.25%	3.75%
12	2.25%	5.75%	0.00%	3.50%	0.25%	3.75%
13	1.00%	4.50%	0.00%	3.50%	0.25%	3.75%
14	1.00%	4.50%	0.00%	3.50%	0.25%	3.75%
15	1.00%	4.50%	0.00%	3.50%	0.25%	3.75%
16	1.00%	4.50%	0.00%	3.50%	0.00%	3.50%
17	0.75%	4.25%	0.00%	3.50%	0.00%	3.50%
18	0.75%	4.25%	0.00%	3.50%	0.00%	3.50%
19	0.50%	4.00%	0.00%	3.50%	0.00%	3.50%
20	0.50%	4.00%	0.00%	3.50%	0.00%	3.50%
21	0.50%	4.00%	0.00%	3.50%	0.00%	3.50%
22	0.25%	3.75%	0.00%	3.50%	0.00%	3.50%
23 or more	0.00%	3.50%	0.00%	3.50%	0.00%	3.50%

Salary Increase Rates

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Salary increases are assumed to occur once a year, on July 1. Therefore the pay used for the period year following the valuation date is equal to the reported pay for the prior year, increased by the salary increase assumption. For employees with less than one year of service, the reported rate of pay is used rather than the fiscal year salary paid.

3.   Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.25% for State Employees and MERS General, 3.00% for Teachers, and 3.50% for MERS P&F per year. This increase rate is solely due to the effect of wage inflation on salaries, with no allowance for future membership growth.

4.   Post-retirement Benefit Increase: Post-retirement benefit increases are assumed to be 2%, per annum, while the plan has a funding level that exceeds 80%; however, an interim COLA will be granted in five-year intervals while the COLA is suspended. The first such COLA will be applicable in Calendar Year 2018. As of June 30, 2013, it is assumed that the COLAs will be suspended for 14 years due to the current funding level of the plans. The actual COLA will be determined based on the plan's five-year average investment rate of return (return on actuarial assets) minus 5.5% and will range from zero to 4.0%.

B.   Demographic Assumptions

1.   Post-termination mortality rates (non-disabled)

a.   Male State Employees, MERS General and MERS P&F: 115% of RP-2000 Combined Healthy for Males with White Collar adjustments, projected with Scale AA from 2000.

b.   Female State Employees, MERS General and MERS P&F: 95% of RP-2000 Combined Healthy for Females with White Collar adjustments, projected with Scale AA from 2000.

c.   Male Teachers: 97% of rates in a GRS table based on male teacher experience, projected with Scale AA from 2000.

d.   Female Teachers: 92% of rates in a GRS table based on female teacher experience, projected with Scale AA from 2000.

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The following table provides the life expectancy for individuals retiring in future years based on the assumption with full generational projection:

Life Expectancy for an Age 65 Retiree in Years					
Group	Year of Retirement				
	2010	2015	2020	2025	2030
State Employee - Male	18.9	19.2	19.6	20.0	20.3
State Employee - Female	22.1	22.4	22.6	22.8	23.0
Teacher - Male	21.5	21.8	22.1	22.4	22.7
Teacher - Female	23.8	24.0	24.2	24.4	24.5

2. Post-retirement mortality (disabled lives): One set of rates is used for all employees

a. Males: 60% of the PBGC Table Va for disabled males eligible for Social Security disability benefits

b. Females: 60% of the PBGC Table VIa for disabled females eligible for Social Security disability benefits.

Sample rates are shown below:

Number of Deaths per 100		
Age	Males	Females
25	2.90	1.58
30	2.17	1.42
35	1.67	1.28
40	1.69	1.25
45	1.93	1.34
50	2.30	1.54
55	2.89	1.77
60	3.62	1.99
65	4.07	2.22
70	4.43	2.47
75	5.05	2.95
80	6.77	4.48

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3.   Pre-retirement mortality: Use the RP-2000 Combined tables with white-collar adjustment for males and females as the base table, and then to apply a 75% for non-teachers (State Employees, MERS General, and MERS P&F) and a 50% multiplier for Teachers. Sample rates are shown below:

	Number of Deaths per 100			
	Non-Teachers		Teachers	
Age	Males	Females	Males	Females
25	0.03	0.02	0.02	0.01
30	0.03	0.02	0.02	0.01
35	0.04	0.03	0.03	0.02
40	0.07	0.05	0.04	0.03
45	0.10	0.08	0.07	0.05
50	0.15	0.12	0.10	0.08
55	0.25	0.19	0.17	0.13
60	0.42	0.35	0.28	0.23
65	0.83	0.65	0.55	0.43
70	1.45	1.14	0.96	0.76

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4.   Disability rates: Sample rates are shown below. Ordinary disability rates are not applied to members eligible for retirement. One half the accidental disabilities are assumed to be totally and permanently disabled from any occupation.

Age	Number of Disabilities per 1,000							
	State Ordinary Males	State Accidental Males	State Ordinary Females	State Accidental Females	Teachers Ordinary Males	Teachers Accidental Males	Teachers Ordinary Females	Teachers Accidental Females
25	0.32	0.18	0.45	0.14	0.27	0.04	0.23	0.04
30	0.39	0.22	0.55	0.17	0.33	0.04	0.28	0.04
35	0.53	0.30	0.75	0.23	0.45	0.06	0.38	0.06
40	0.77	0.44	1.10	0.33	0.66	0.09	0.55	0.09
45	1.26	0.72	1.80	0.54	1.08	0.14	0.90	0.14
50	2.14	1.22	3.05	0.92	1.83	0.24	1.53	0.24
55	3.54	2.02	5.05	1.52	3.03	0.40	2.53	0.40
60	4.94	2.82	7.05	2.12	4.23	0.56	3.53	0.56
65	8.09	4.62	11.55	3.47	6.93	0.92	5.78	0.92

Age	MERS General, Ordinary, Males	MERS General, Accidental, Males	MERS General, Ordinary, Females	MERS General, Accidental, Females	MERS P&F, Ordinary, Males and Females	MERS P&F, Accidental, Males and Females
25	0.59	0.18	0.27	0.06	0.26	1.70
30	0.72	0.22	0.33	0.08	0.33	2.20
35	0.98	0.30	0.45	0.11	0.44	2.90
40	1.43	0.44	0.66	0.15	0.66	4.40
45	2.34	0.72	1.08	0.25	1.08	7.20
50	3.97	1.22	1.83	0.43	1.82	12.10
55	6.57	2.02	3.03	0.71	1.82	12.10
60	9.17	2.82	4.23	0.99	1.82	12.10
65	15.02	4.62	6.93	1.62	1.82	12.10

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5.   Termination rates (for causes other than death, disability, or retirement) are a function of the member's service. Termination rates are not applied to members eligible for retirement. Rates are shown below:

Service	State Employees	Teachers	MERS General	MERS P&F
1	0.160000	0.180000	0.175000	0.100000
2	0.101160	0.120000	0.118774	0.047300
3	0.080768	0.080000	0.101396	0.036903
4	0.068839	0.064811	0.086148	0.030821
5	0.060375	0.048163	0.072887	0.026506
6	0.053810	0.038256	0.061471	0.023158
7	0.048446	0.031695	0.051757	0.020424
8	0.043911	0.027033	0.043604	0.018111
9	0.039983	0.023553	0.036868	0.016108
10	0.036518	0.020857	0.031408	0.014342
11	0.033418	0.018708	0.027082	0.012761
12	0.030614	0.016956	0.023746	0.011332
13	0.028054	0.015500	0.021259	0.010026
14	0.025699	0.014271	0.019479	0.008826
15	0.023519	0.013220	0.018263	0.007714
16	0.021489	0.012312	0.017470	0.006679
17	0.019590	0.011518	0.016956	0.005711
18	0.017807	0.010820	0.016579	0.004802
19	0.016125	0.010200	0.016198	0.003944
20	0.014535	0.009646	0.015669	0.000000
21	0.013026	0.009149	0.014851	0.000000
22	0.011590	0.008700	0.013602	0.000000
23	0.010222	0.008292	0.011778	0.000000
24	0.008914	0.007920	0.009239	0.000000
25	0.007662	0.007580	0.005841	0.000000

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6.   Retirement rates (unreduced):

For State Employees (except Correctional Officers) and MERS General: a flat 25% per year retirement probability for members eligible for unreduced retirement. A 50% retirement probability at first eligibility will be only applied if they have reached age 65 or with at least 25 years of service.

For Teachers: a flat 25% per year retirement probability for members eligible for unreduced retirement. A 60% retirement probability at first eligibility will be only applied if they have reached age 65 or with at least 25 years of service.

For MERS P&F: Unisex, service based rates are used for police and fire. Rates depend on whether the unit had elected the optional 20-year retirement provisions. All members are assumed to retire upon reaching age 65 with at least ten years of service. Because of the enactment of the RIRSA in 2011, the retirement assumption was modified for members not eligible for retirement by July 1, 2012. Members who would have been assumed to retire at an earlier age under the rules in effect before the enactment of the provision changes are assumed to retire when first eligible for an unreduced benefit. This demand is recognized by adding a 10% probability for every year the member has been deferred.

MERS P&F		
Service	Units with the Optional 20-year retirement election	Units without the Optional 20-year retirement election
20	12.0%	
21	10.0%	
22	10.0%	
23	10.0%	
24	12.0%	
25	14.0%	50.0%
26	16.0%	16.0%
27	18.0%	18.0%
28	20.0%	20.0%
29	20.0%	20.0%
30+	35.0%	35.0%

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For Correctional Officers: A set of unisex rates, indexed by service, as shown below. All members still active are assumed to retire at age 65 with 10 years of service. Because of the enactment of Article 7 in 2009 and the RIRSA in 2011, the retirement assumption was modified for members whose retirement ages were delayed. Members who would have been assumed to retire prior to under the rules in effect before the enactment of the provision changes are assumed to retire when first eligible for an unreduced benefit. This demand is recognized by adding a 10% probability for every year the member has been deferred.

Corrections	
Service	Ret. Rate
20	5.0%
21	5.0%
22	5.0%
23	5.0%
24	5.0%
25	5.0%
26	5.0%
27	5.0%
28	5.0%
29	5.0%
30	13.0%
31	13.0%
32	13.0%
33	20.0%
34	20.0%
35	35.0%
36	25.0%
37	25.0%
38	25.0%
39	25.0%
40	100.0%

For members with 10 or more years of contributory service on June 30, 2012 and that reach their Article 7 Retirement Date within three years of June 30, 2012, 5% are assumed to retire upon first attainment of their Article 7 Retirement Date and receive their benefits accrued as of June 30, 2012.

7. Reduced retirement Members are eligible to retire with reduced benefit five years prior to their normal retirement age. Rates are on the years from normal retirement age, as shown below:

Year from Normal Retirement Age	Ret. Rate
5	2%
4	2%
3	2%
2	3%
1	4%

C. Other Assumptions

1. Valuation payroll (used for determining the amortization contribution rate): Prior aggregate fiscal year payroll projected forward one year using the overall payroll growth rate.

2. Percent married: For State Employees and Teachers, 85% of employees are assumed to be married. For MERS employees (both MERS General and MERS P&F), 80% of employees are assumed to be married.

3. 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.

4. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity. The spousal annuity death benefit for vested married participants is valued using a static optional form conversion factor of 0.84 and 0.78 for males and females respectively.

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5. For active death benefits, the liability is initially calculated based on the ordinary death benefit provisions, and then a 7.5% load is applied to account for duty related benefits.

6. Percent electing deferred termination benefit: Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.

7. Recovery from disability: None assumed.

8. Remarriage: It is assumed that no surviving spouse will remarry and there will be no children's benefit.

9. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available.

10. Investment and administrative expenses: The assumed investment return rate represents the anticipated net return after payment of all investment and administrative expenses.

11. Inactive members: Liabilities for inactive members are approximated as a multiple of their member contribution account balances. For non-vested inactive members, the multiple is 1.0. For vested inactive members, the multiple is 8.0 for members with 25 or more years of service, 3.0 for vested inactive members age 45 or older with less than 25 years of service, and 1.0 for other vested inactive members younger than age 45.

12. Decrement timing: For all non-teachers employees (State Employees, MERS General, and MERS P&F), decrements are assumed to occur at the middle of the year. For Teachers the retirement and termination decrements are assumed to occur at the beginning of the year, while death and disability are assumed to occur at the middle of the year.

13. Eligibility testing: Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

14. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

15. Incidence of Contributions: Contributions are assumed to be received continuously throughout the year based upon the computed percent of

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payroll shown in this report, and the actual payroll payable at the time contributions are made.

16. Benefit Service: All members are assumed to accrue one year of eligibility service each year.

17. All calculations were performed without regard to the compensation limit in IRC Section 401(a)(17) and the benefit limit under IRC Section 415.

D.   Participant Data

Participant data was supplied on electronic files. There are separate files for (i) active and inactive members, and (ii) members and beneficiaries receiving benefits.

The data for active members included name, an identification number, gender, a code indicating whether the member was active or inactive, a code indicating employee type (State Employee, Teacher, MERS General or MERS P&F), date of birth, service, salary, date of last contribution, accumulated member contributions without interest, accrued benefit multiplier as of June 30, 2013, Final Average Compensation as of June 30, 2012, Article 7 Retirement Date, and the Rhode Island Retirement Security Act Retirement Date.   For retired members and beneficiaries, the data included name, an identification number, gender, date of birth, date of retirement, amount of benefit, the amount of adjustment after age 62 for anyone electing the Social Security option, a code indicating the option elected and the type of retiree (service retiree, disabled retiree, beneficiary), and if applicable, the joint pensioner's date of birth and gender.

Salary supplied for the current year was based on the earnings for the fiscal year preceding the valuation date. However, for members with less than one year of service, the current rate of salary was used. This salary was adjusted by the salary increase rate for one year.

In defining who was an active member, members with a date of last contribution in the final quarter of the fiscal year were considered active. Otherwise, the member was defined as inactive.

To correct for incomplete and inconsistent data, we first attempted to pulled data from prior valuation files and then made general assumptions to fill in the rest. These modifications had no material impact on the results presented.

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SECTION VII

SUMMARY OF DATA AND EXPERIENCE

List of Tables

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List of Tables (Continued)

NON-DISABLED STATE EMPLOYEES AND MERS
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	10	1,296	0.0077	0.0023	0.0023	3	3	333%	333%
55-59	28	3,144	0.0089	0.0040	0.0040	13	13	215%	215%
60-64	51	5,658	0.0090	0.0072	0.0072	43	43	119%	119%
65-69	102	5,696	0.0179	0.0142	0.0142	80	80	128%	128%
70-74	144	5,056	0.0285	0.0236	0.0236	121	121	119%	119%
75-79	195	4,635	0.0421	0.0427	0.0427	200	200	98%	98%
80-84	308	4,071	0.0757	0.0795	0.0795	323	323	95%	95%
85-89	342	2,642	0.1294	0.1410	0.1410	363	363	94%	94%
90-94	161	895	0.1799	0.2366	0.2366	201	201	80%	80%
95-99	48	159	0.3019	0.3380	0.3380	51	51	94%	94%
100-104	9	15	0.6000	0.4274	0.4274	6	6	150%	150%
Totals	1,398	33,267	-	-	-	1,404	1,404	100%	100%

Proposed Rate fit to 06/30/2010, the mid point of the study period

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NON-DISABLED STATE EMPLOYEES AND MERS
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	0	3	1,165	0.0026	0.0016	0.0016	2	2	150%	150%
55-59	0	18	2,999	0.0060	0.0030	0.0030	9	9	200%	200%
60-64	0	31	5,360	0.0058	0.0054	0.0054	30	30	103%	103%
65-69	0	61	6,804	0.0090	0.0099	0.0099	68	68	90%	90%
70-74	0	97	6,875	0.0141	0.0168	0.0168	116	116	84%	84%
75-79	0	185	6,342	0.0292	0.0279	0.0279	179	179	103%	103%
80-84	0	282	6,288	0.0448	0.0473	0.0473	299	299	94%	94%
85-89	0	391	4,381	0.0892	0.0844	0.0844	362	362	108%	108%
90-94	0	275	1,821	0.1510	0.1392	0.1392	245	245	112%	112%
95-99	0	118	525	0.2248	0.2024	0.2024	101	101	117%	117%
100-104	0	22	66	0.3333	0.2418	0.2418	15	15	147%	147%
Totals	0	1,483	42,626	-	-	-	1,426	1,426	104%	104%

Proposed Rate fit to 06/30/2010, the mid point of the study period

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NON-DISABLED TEACHERS
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	0	122	0.0000	0.0027	0.0027	0	0	0%	0%
55-59	7	1,576	0.0044	0.0041	0.0041	6	6	117%	117%
60-64	28	5,175	0.0054	0.0043	0.0043	22	22	127%	127%
65-69	44	5,066	0.0087	0.0064	0.0064	34	34	129%	129%
70-74	52	3,097	0.0168	0.0168	0.0168	50	50	104%	104%
75-79	71	2,097	0.0339	0.0261	0.0261	57	57	125%	125%
80-84	94	1,372	0.0685	0.0596	0.0596	80	80	118%	118%
85-89	64	747	0.0857	0.1128	0.1128	82	82	78%	78%
90-94	39	283	0.1378	0.1938	0.1938	53	53	74%	74%
95-99	18	56	0.3214	0.2847	0.2847	15	15	120%	120%
100-104	3	6	0.5000	0.3654	0.3654	2	2	150%	150%
Totals	420	19,597	-	-	-	401	401	105%	105%

Proposed Rate fit to 1/1/2011, the mid point of the study period

GRS

NON-DISABLED TEACHERS
POST-RETIREMENT 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)
50-54	0	416	0.0000	0.0018	0.0018	1	1	0%	0%
55-59	11	4,646	0.0024	0.0042	0.0042	20	20	55%	55%
60-64	47	10,898	0.0043	0.0036	0.0036	40	40	118%	118%
65-69	37	7,108	0.0052	0.0048	0.0048	35	35	106%	106%
70-74	43	4,172	0.0103	0.0099	0.0099	40	40	108%	108%
75-79	60	2,875	0.0209	0.0157	0.0157	47	47	128%	128%
80-84	94	2,491	0.0377	0.0391	0.0391	98	98	96%	96%
85-89	108	1,605	0.0673	0.0860	0.0860	135	135	80%	80%
90-94	130	882	0.1474	0.1491	0.1491	128	128	102%	102%
95-99	77	300	0.2567	0.2255	0.2255	65	65	118%	118%
100-104	25	62	0.4032	0.3137	0.3137	18	18	139%	139%
Totals	632	35,455	-	-	-	627	627	101%	101%

Proposed Rate fit to 1/1/2011, the mid point of the study period

GRS

ALL EMPLOYEES
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)
30-34	1	8	0.1250	0.0192	0.0192	0	0	654%	654%
35-39	1	33	0.0303	0.0163	0.0163	1	1	184%	184%
40-44	0	199	0.0000	0.0178	0.0178	4	4	0%	0%
45-49	5	371	0.0135	0.0204	0.0204	8	8	65%	65%
50-54	13	507	0.0256	0.0252	0.0252	13	13	101%	101%
55-59	16	762	0.0210	0.0319	0.0319	24	24	65%	65%
60-64	25	821	0.0305	0.0386	0.0386	31	31	80%	80%
65-69	22	530	0.0415	0.0418	0.0418	22	22	99%	99%
70-74	23	365	0.0630	0.0466	0.0466	17	17	135%	135%
75-79	22	249	0.0884	0.0545	0.0545	14	14	161%	161%
80-84	18	166	0.1084	0.0793	0.0793	13	13	137%	137%
85-89	15	96	0.1563	0.1188	0.1188	11	11	133%	133%
Other	9	34	0.2647	0.0000	0.0000	5	5	175%	175%
Totals	170	4,141				163	163	104%	104%

GRS

ALL EMPLOYEES
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)
30-34	0	4	0.0000	0.0136	0.0136	0	0	0%	0%
35-39	0	30	0.0000	0.0126	0.0126	0	0	0%	0%
40-44	1	105	0.0095	0.0128	0.0128	1	1	74%	74%
45-49	5	204	0.0245	0.0141	0.0141	3	3	172%	172%
50-54	7	409	0.0171	0.0163	0.0163	7	7	104%	104%
55-59	16	702	0.0228	0.0184	0.0184	13	13	123%	123%
60-64	12	849	0.0141	0.0208	0.0208	18	18	68%	68%
65-69	18	619	0.0291	0.0232	0.0232	14	14	126%	126%
70-74	11	424	0.0259	0.0260	0.0260	11	11	100%	100%
75-79	15	294	0.0510	0.0347	0.0347	10	10	148%	148%
80-84	11	202	0.0545	0.0531	0.0531	11	11	104%	104%
85-89	11	126	0.0873	0.0793	0.0793	10	10	112%	112%
Other	13	72	0.1806	0.0000	0.0000	10	10	133%	133%
Totals	120	4,040				108	108	111%	111%

GRS

STATE EMPLOYEES AND MERS
MALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

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	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
20-24	1	276	0.0036	0.0003	0.0003	-	-	N/A	N/A
25-29	1	1,193	0.0008	0.0003	0.0003	-	-	N/A	N/A
30-34	1	1,643	0.0006	0.0003	0.0003	1	1	100%	100%
35-39	-	3,476	0.0000	0.0005	0.0005	2	2	0%	0%
40-44	1	3,869	0.0003	0.0008	0.0008	3	3	33%	33%
45-49	9	5,214	0.0017	0.0012	0.0012	6	6	150%	150%
50-54	4	5,673	0.0007	0.0019	0.0019	11	11	36%	36%
55-59	21	5,154	0.0041	0.0031	0.0031	16	16	131%	131%
60-64	16	3,315	0.0048	0.0055	0.0055	18	18	89%	89%
65-69	7	1,119	0.0063	0.0105	0.0105	11	11	64%	64%
70-74	5	303	0.0165	0.0179	0.0179	5	5	100%	100%
75 and over	7	2	3.5000	0.0318	0.0318	-	-	N/A	N/A
Totals	73	31,237				73	73	100%	100%

GRS

STATE EMPLOYEES AND MERS
FEMALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

				Assumed Rate		Expected Deaths		Actual/Expected	
Age	Actual Deaths	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	1	0.0000	0.0001	0.0001	-	-	N/A	N/A
20-24	-	166	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	-	1,292	0.0000	0.0002	0.0002	-	-	N/A	N/A
30-34	-	2,053	0.0000	0.0003	0.0003	1	1	0%	0%
35-39	-	4,100	0.0000	0.0004	0.0004	2	2	0%	0%
40-44	2	4,287	0.0005	0.0006	0.0006	3	3	67%	67%
45-49	5	5,831	0.0009	0.0009	0.0009	5	5	100%	100%
50-54	8	7,009	0.0011	0.0014	0.0014	10	10	80%	80%
55-59	15	5,775	0.0026	0.0025	0.0025	14	14	107%	107%
60-64	14	3,731	0.0038	0.0045	0.0045	16	16	88%	88%
65-69	3	1,401	0.0021	0.0082	0.0082	11	11	27%	27%
70-74	6	322	0.0186	0.0141	0.0141	4	4	150%	150%
75 and over	-	5	0.0000	0.0237	0.0237	-	-	N/A	N/A
Totals	53	35,973				66	66	80%	80%

GRS

TEACHERS
MALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

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	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
20-24	-	62	0.0000	0.0002	0.0002	-	-	N/A	N/A
25-29	-	772	0.0000	0.0002	0.0002	-	-	N/A	N/A
30-34	-	2,032	0.0000	0.0002	0.0002	-	-	N/A	N/A
35-39	1	3,702	0.0003	0.0004	0.0004	1	1	100%	100%
40-44	3	3,327	0.0009	0.0005	0.0005	2	2	150%	150%
45-49	4	2,356	0.0017	0.0008	0.0008	2	2	200%	200%
50-54	3	2,252	0.0013	0.0012	0.0012	3	3	100%	100%
55-59	5	2,558	0.0020	0.0020	0.0020	5	5	100%	100%
60-64	9	1,574	0.0057	0.0037	0.0037	6	6	150%	150%
65-69	2	350	0.0057	0.0070	0.0070	2	2	100%	100%
70-74	-	65	0.0000	0.0119	0.0119	1	1	0%	0%
75 and over	1	2	0.5000	0.0212	0.0212	-	-	N/A	N/A
Totals	28	19,052				22	22	127%	127%

GRS

TEACHERS
FEMALE PRE-RETIREMENT MORTALITY (COMBINED ORDINARY AND DUTY)

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	-	-	N/A	0.0001	0.0001	-	-	N/A	N/A
20-24	-	285	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	-	3,317	0.0000	0.0001	0.0001	-	-	N/A	N/A
30-34	2	7,349	0.0003	0.0002	0.0002	1	1	200%	200%
35-39	2	10,242	0.0002	0.0003	0.0003	3	3	67%	67%
40-44	4	9,058	0.0004	0.0004	0.0004	3	3	133%	133%
45-49	5	8,249	0.0006	0.0006	0.0006	5	5	100%	100%
50-54	5	8,848	0.0006	0.0010	0.0010	9	9	56%	56%
55-59	15	9,258	0.0016	0.0017	0.0017	15	15	100%	100%
60-64	9	4,778	0.0019	0.0030	0.0030	14	14	64%	64%
65-69	2	1,099	0.0018	0.0055	0.0055	6	6	33%	33%
70-74	1	148	0.0068	0.0094	0.0094	1	1	100%	100%
75 and over	1	4	0.2500	0.0158	0.0158	-	-	N/A	N/A
Totals	46	62,635				57	57	81%	81%

GRS

STATE EMPLOYEES
MALE ORDINARY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	6	0.0000	0.0003	0.0003	-	-	N/A	N/A
25-29	-	313	0.0000	0.0004	0.0003	-	-	N/A	N/A
30-34	-	1,024	0.0000	0.0005	0.0004	1	-	0%	N/A
35-39	1	1,925	0.0005	0.0007	0.0006	1	1	100%	100%
40-44	3	3,348	0.0009	0.0011	0.0010	4	3	75%	100%
45-49	4	4,539	0.0009	0.0018	0.0016	8	7	50%	57%
50-54	3	4,166	0.0007	0.0031	0.0027	13	11	23%	27%
55-59	15	3,370	0.0045	0.0047	0.0041	16	14	94%	107%
60-64	7	882	0.0079	0.0064	0.0056	5	5	140%	140%
65-69	1	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	1	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	35	19,573	0.002			48	41	73%	85%

STATE EMPLOYEES
FEMALE ORDINARY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	10	0.0000	0.0004	0.0004	-	-	N/A	N/A
25-29	-	371	0.0000	0.0005	0.0005	-	-	N/A	N/A
30-34	-	1,213	0.0000	0.0006	0.0006	1	1	0%	0%
35-39	1	2,236	0.0004	0.0009	0.0009	2	2	50%	50%
40-44	6	3,534	0.0017	0.0014	0.0014	5	5	120%	120%
45-49	8	4,866	0.0016	0.0023	0.0023	11	11	73%	73%
50-54	14	5,408	0.0026	0.0039	0.0039	21	21	67%	67%
55-59	26	4,382	0.0059	0.0059	0.0059	25	25	104%	104%
60-64	11	1,027	0.0107	0.0080	0.0080	8	8	138%	138%
65-69	2	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	68	23,047	0.003			73	73	93%	93%

GRS

TEACHERS
MALE ORDINARY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
25-29	-	255	0.0000	0.0002	0.0003	-	-	N/A	N/A
30-34	-	1,504	0.0000	0.0003	0.0004	-	1	N/A	0%
35-39	-	3,132	0.0000	0.0004	0.0005	1	2	0%	0%
40-44	1	3,164	0.0003	0.0007	0.0008	2	3	50%	33%
45-49	2	2,245	0.0009	0.0012	0.0014	3	3	67%	67%
50-54	9	1,969	0.0046	0.0019	0.0023	4	5	225%	180%
55-59	7	1,833	0.0038	0.0029	0.0035	5	6	140%	117%
60-64	2	469	0.0043	0.0040	0.0048	2	2	100%	100%
65-69	2	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	23	14,571	0.002			17	22	135%	105%

GRS

TEACHERS
FEMALE ORDINARY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	-	N/A	0.0002	0.0002	-	-	N/A	N/A
25-29	-	1,241	0.0000	0.0002	0.0002	-	-	N/A	N/A
30-34	1	5,726	0.0002	0.0003	0.0003	2	2	50%	50%
35-39	3	8,641	0.0003	0.0004	0.0004	4	4	75%	75%
40-44	5	8,428	0.0006	0.0007	0.0007	6	6	83%	83%
45-49	8	7,715	0.0010	0.0012	0.0012	9	9	89%	89%
50-54	15	7,766	0.0019	0.0019	0.0019	15	15	100%	100%
55-59	26	7,391	0.0035	0.0029	0.0029	21	21	124%	124%
60-64	1	1,292	0.0008	0.0040	0.0040	5	5	20%	20%
65-69	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	59	48,200	0.001			62	62	95%	95%

GENERAL EMPLOYEES
MALE ORDINARY 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	1	-	N/A	0.0000	0.0000	-	-	N/A	N/A
20-24	-	6	0.0000	0.0005	0.0005	-	-	N/A	N/A
25-29	-	172	0.0000	0.0007	0.0006	-	-	N/A	N/A
30-34	-	462	0.0000	0.0009	0.0008	-	-	N/A	N/A
35-39	-	643	0.0000	0.0012	0.0012	1	1	0%	0%
40-44	-	1,410	0.0000	0.0019	0.0018	3	3	0%	0%
45-49	4	2,104	0.0019	0.0032	0.0030	7	6	57%	67%
50-54	8	2,536	0.0032	0.0054	0.0050	14	13	57%	62%
55-59	14	1,563	0.0090	0.0082	0.0076	12	11	117%	127%
60-64	3	227	0.0132	0.0111	0.0115	2	2	150%	150%
65-69	-	-	N/A	0.0000	0.0174	-	-	N/A	N/A
70-74	1	-	N/A	0.0000	0.0232	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0291	-	-	N/A	N/A
Totals	31	9,123	0.003			39	36	79%	86%

GRS

GENERAL EMPLOYEES
FEMALE ORDINARY DISABILITY EXPERIENCE

Age	Actual Disabilities	Total Count	Actual Rate	Assumed Rate Current	Assumed Rate Proposed	Expected Disabilities Current	Expected Disabilities Proposed	Actual/Expected Current (2) / (7)	Actual/Expected Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
20-24	-	4	0.0000	0.0002	0.0002	-	-	N/A	N/A
25-29	-	81	0.0000	0.0003	0.0003	-	-	N/A	N/A
30-34	-	295	0.0000	0.0004	0.0004	-	-	N/A	N/A
35-39	-	633	0.0000	0.0005	0.0005	-	-	N/A	N/A
40-44	2	1,458	0.0014	0.0008	0.0008	1	1	200%	200%
45-49	3	2,917	0.0010	0.0014	0.0014	4	4	75%	75%
50-54	7	4,609	0.0015	0.0023	0.0023	11	11	64%	64%
55-59	5	2,994	0.0017	0.0035	0.0035	10	10	50%	50%
60-64	6	294	0.0204	0.0048	0.0053	1	1	600%	600%
65-69	1	-	N/A	0.0000	0.0080	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0107	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0134	-	-	N/A	N/A
Totals	24	13,285	0.002			27	27	89%	89%

GRS

POLICE AND FIRE OFFICERS
ORDINARY DISABILITY EXPERIENCE (MALE AND FEMALE COMBINED)

				Assumed Rate		Expected Disabilities		Actual/Expected	
	Actual	Total	Actual					Current	Proposed
Age	Disabilities	Count	Rate	Current	Proposed	Current	Proposed	(2) / (7)	(2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Under 20	-	-	N/A	0.0003	0.0002	-	-	N/A	N/A
20-24	-	4	0.0000	0.0004	0.0002	-	-	N/A	N/A
25-29	-	307	0.0000	0.0005	0.0003	-	-	N/A	N/A
30-34	-	938	0.0000	0.0006	0.0004	1	-	0%	N/A
35-39	1	1,343	0.0007	0.0009	0.0005	1	1	100%	100%
40-44	-	1,768	0.0000	0.0014	0.0008	2	1	0%	0%
45-49	2	1,232	0.0016	0.0023	0.0014	3	2	67%	100%
50-54	-	229	0.0000	0.0030	0.0018	1	-	0%	N/A
55-59	-	15	0.0000	0.0030	0.0018	-	-	N/A	N/A
60-64	-	2	0.0000	0.0030	0.0018	-	-	N/A	N/A
65-69	-	1	0.0000	0.0030	0.0018	-	-	N/A	N/A
70-74	-	-	N/A	0.0030	0.0018	-	-	N/A	N/A
75 and over	-	-	N/A	0.0030	0.0018	-	-	N/A	N/A
Totals	3	5,839	0.001			8	4	38%	75%

GRS

STATE EMPLOYEES
MALE DUTY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	276	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	-	1,193	0.0000	0.0002	0.0002	-	-	N/A	N/A
30-34	-	1,643	0.0000	0.0002	0.0003	-	-	N/A	N/A
35-39	-	3,476	0.0000	0.0003	0.0004	1	1	0%	0%
40-44	9	3,869	0.0023	0.0005	0.0006	2	2	450%	450%
45-49	5	5,214	0.0010	0.0008	0.0009	4	5	125%	100%
50-54	9	5,673	0.0016	0.0014	0.0015	8	9	113%	100%
55-59	7	5,154	0.0014	0.0021	0.0023	11	12	64%	58%
60-64	6	2,299	0.0026	0.0029	0.0032	6	7	100%	86%
65-69	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	36	28,797				32	36	113%	100%

GRS

STATE EMPLOYEES
FEMALE DUTY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	166	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	-	1,292	0.0000	0.0001	0.0001	-	-	N/A	N/A
30-34	2	2,053	0.0010	0.0001	0.0002	-	-	N/A	N/A
35-39	3	4,100	0.0007	0.0002	0.0003	1	1	300%	300%
40-44	3	4,287	0.0007	0.0003	0.0004	1	2	300%	150%
45-49	6	5,831	0.0010	0.0005	0.0007	3	4	200%	150%
50-54	9	7,009	0.0013	0.0008	0.0012	5	8	180%	113%
55-59	13	5,775	0.0023	0.0012	0.0018	7	10	186%	130%
60-64	5	2,549	0.0020	0.0016	0.0024	4	6	125%	83%
65-69	3	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	44	33,062				21	31	210%	142%

GRS

TEACHERS
MALE DUTY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	62	0.0000	0.0000	0.0000	-	-	N/A	N/A
25-29	-	772	0.0000	0.0000	0.0000	-	-	N/A	N/A
30-34	-	2,032	0.0000	0.0001	0.0001	-	-	N/A	N/A
35-39	-	3,702	0.0000	0.0001	0.0001	-	-	N/A	N/A
40-44	-	3,327	0.0000	0.0001	0.0001	-	-	N/A	N/A
45-49	-	2,356	0.0000	0.0002	0.0002	-	-	N/A	N/A
50-54	-	2,252	0.0000	0.0003	0.0003	1	1	0%	0%
55-59	1	2,558	0.0004	0.0005	0.0005	1	1	100%	100%
60-64	1	1,157	0.0009	0.0006	0.0006	1	1	100%	100%
65-69	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	2	18,218				3	3	67%	67%

GRS

TEACHERS
FEMALE DUTY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	285	0.0000	0.0000	0.0000	-	-	N/A	N/A
25-29	-	3,317	0.0000	0.0000	0.0000	-	-	N/A	N/A
30-34	-	7,349	0.0000	0.0001	0.0001	-	-	N/A	N/A
35-39	-	10,242	0.0000	0.0001	0.0001	1	1	0%	0%
40-44	2	9,058	0.0002	0.0001	0.0001	1	1	200%	200%
45-49	1	8,249	0.0001	0.0002	0.0002	2	2	50%	50%
50-54	1	8,848	0.0001	0.0003	0.0003	3	3	33%	33%
55-59	2	9,258	0.0002	0.0005	0.0005	4	4	50%	50%
60-64	2	3,566	0.0006	0.0006	0.0006	2	2	100%	100%
65-69	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0000	-	-	N/A	N/A
Totals	8	60,172				13	13	62%	62%

GRS

GENERAL EMPLOYEES
MALE DUTY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	105	0.0000	0.0002	0.0001	-	-	N/A	N/A
25-29	-	424	0.0000	0.0002	0.0002	-	-	N/A	N/A
30-34	-	707	0.0000	0.0003	0.0003	-	-	N/A	N/A
35-39	1	893	0.0011	0.0004	0.0004	-	-	N/A	N/A
40-44	1	1,755	0.0006	0.0007	0.0006	1	1	100%	100%
45-49	2	2,520	0.0008	0.0012	0.0009	3	2	67%	100%
50-54	3	3,585	0.0008	0.0019	0.0015	7	5	43%	60%
55-59	5	2,613	0.0019	0.0029	0.0023	8	6	63%	83%
60-64	1	1,253	0.0008	0.0040	0.0035	5	4	20%	25%
65-69	2	-	N/A	0.0000	0.0053	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0071	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0089	-	-	N/A	N/A
Totals	15	13,855				24	18	63%	83%

GRS

GENERAL EMPLOYEES
FEMALE DUTY 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	0.0000	0.0000	-	-	N/A	N/A
20-24	-	52	0.0000	0.0001	0.0001	-	-	N/A	N/A
25-29	-	300	0.0000	0.0001	0.0001	-	-	N/A	N/A
30-34	-	548	0.0000	0.0001	0.0001	-	-	N/A	N/A
35-39	1	967	0.0010	0.0001	0.0001	-	-	N/A	N/A
40-44	-	2,048	0.0000	0.0002	0.0002	-	-	N/A	N/A
45-49	1	3,643	0.0003	0.0004	0.0003	1	1	100%	100%
50-54	1	6,097	0.0002	0.0006	0.0005	4	3	25%	33%
55-59	2	4,671	0.0004	0.0009	0.0008	4	4	50%	50%
60-64	2	2,151	0.0009	0.0013	0.0012	3	2	67%	100%
65-69	-	-	N/A	0.0000	0.0019	-	-	N/A	N/A
70-74	-	-	N/A	0.0000	0.0025	-	-	N/A	N/A
75 and over	-	-	N/A	0.0000	0.0031	-	-	N/A	N/A
Totals	7	20,477				12	10	58%	70%

GRS

POLICE AND FIRE OFFICERS
DUTY DISABILITY EXPERIENCE (MALE AND FEMALE COMBINED)

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	0.0012	0.0012	-	-	N/A	N/A
20-24	-	137	0.0000	0.0014	0.0014	-	-	N/A	N/A
25-29	1	871	0.0011	0.0019	0.0019	2	2	50%	50%
30-34	1	1,221	0.0008	0.0025	0.0025	3	3	33%	33%
35-39	7	1,542	0.0045	0.0035	0.0035	5	5	140%	140%
40-44	14	2,204	0.0064	0.0055	0.0055	11	11	127%	127%
45-49	9	1,395	0.0065	0.0092	0.0092	12	12	75%	75%
50-54	7	334	0.0210	0.0121	0.0121	4	4	175%	175%
55-59	-	41	0.0000	0.0121	0.0121	-	-	N/A	N/A
60-64	-	6	0.0000	0.0121	0.0121	-	-	N/A	N/A
65-69	-	1	0.0000	0.0121	0.0121	-	-	N/A	N/A
70-74	-	-	N/A	0.0121	0.0121	-	-	N/A	N/A
75 and over	-	-	N/A	0.0121	0.0121	-	-	N/A	N/A
Totals	39	7,752				37	37	105%	105%

GRS

STATE EMPLOYEES
SERVICE BASED WITHDRAWAL EXPERIENCE

Service	Actual Withdrawal	Total Count	Actual Rate	Assumed Rate		Expected Withdrawal		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	621	3,873	0.160341	0.182587	0.160000	707	620	88%	100%
2	611	5,815	0.105073	0.094489	0.101160	549	588	111%	104%
3	419	5,313	0.078863	0.077020	0.080768	409	429	102%	98%
4	378	5,002	0.075570	0.067025	0.068839	335	344	113%	110%
5	278	4,812	0.057772	0.058408	0.060375	281	291	99%	96%
6	240	4,774	0.050272	0.050933	0.053810	243	257	99%	93%
7	204	4,603	0.044319	0.044518	0.048446	205	223	100%	91%
8	180	4,183	0.043031	0.039037	0.043911	163	184	110%	98%
9	143	3,707	0.038576	0.034487	0.039983	128	148	112%	96%
10	123	3,373	0.036466	0.030777	0.036518	104	123	118%	100%
11	101	3,388	0.029811	0.027737	0.033418	94	113	107%	89%
12	102	3,420	0.029825	0.025301	0.030614	87	105	118%	97%
13	99	3,379	0.029299	0.023389	0.028054	79	95	125%	104%
14	95	3,451	0.027528	0.021879	0.025699	76	89	126%	107%
15	77	3,489	0.022069	0.020719	0.023519	72	82	107%	94%
16	72	3,511	0.020507	0.019842	0.021489	70	75	103%	95%
17	63	3,722	0.016926	0.019010	0.019590	71	73	89%	86%
18	58	3,834	0.015128	0.018283	0.017807	70	68	83%	85%
19	73	3,816	0.019130	0.017423	0.016125	66	62	110%	119%
20	63	3,896	0.016170	0.016469	0.014535	64	57	98%	111%
21	53	3,771	0.014055	0.015268	0.013026	58	49	92%	108%
22	50	3,629	0.013778	0.013722	0.011590	50	42	100%	119%
23	38	3,509	0.010829	0.011659	0.010222	41	36	93%	106%
24	42	3,315	0.012670	0.009096	0.008914	30	30	139%	142%
25	26	3,116	0.008344	0.005922	0.007662	18	24	141%	109%
Totals	4,209	98,701				4,071	4,206	103%	100%

GRS

TEACHERS
SERVICE BASED WITHDRAWAL EXPERIENCE

Service	Actual Withdrawal	Total Count	Actual Rate	Assumed Rate		Expected Withdrawal		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	237	977	0.242579	0.144289	0.180000	141	176	168%	135%
2	829	6,314	0.131296	0.081272	0.120000	513	758	162%	109%
3	551	6,260	0.088019	0.064847	0.080000	406	501	136%	110%
4	438	6,470	0.067697	0.055638	0.064811	360	419	122%	104%
5	352	6,692	0.052600	0.047933	0.048163	321	322	110%	109%
6	299	6,788	0.044048	0.041233	0.038256	280	260	107%	115%
7	241	6,925	0.034801	0.035593	0.031695	246	219	98%	110%
8	215	6,924	0.031051	0.030714	0.027033	213	187	101%	115%
9	178	6,913	0.025749	0.026612	0.023553	184	163	97%	109%
10	139	6,773	0.020523	0.023020	0.020857	156	141	89%	98%
11	155	6,440	0.024068	0.020517	0.018708	132	120	117%	129%
12	154	6,192	0.024871	0.018339	0.016956	114	105	136%	147%
13	96	5,680	0.016901	0.016358	0.015500	93	88	103%	109%
14	82	5,506	0.014893	0.014709	0.014271	81	79	101%	104%
15	87	5,051	0.017224	0.013209	0.013220	67	67	130%	130%
16	68	4,756	0.014298	0.011924	0.012312	57	59	120%	116%
17	45	4,467	0.010074	0.010764	0.011518	48	51	94%	87%
18	50	4,156	0.012031	0.009752	0.010820	41	45	123%	111%
19	38	3,747	0.010141	0.008864	0.010200	33	38	114%	99%
20	23	3,456	0.006655	0.008040	0.009646	28	33	83%	69%
21	27	3,158	0.008550	0.006776	0.009149	21	29	126%	93%
22	23	2,880	0.007986	0.006103	0.008700	18	25	131%	92%
23	23	2,647	0.008689	0.005600	0.008292	15	22	155%	105%
24	20	2,220	0.009009	0.005131	0.007920	11	18	176%	114%
25	11	2,053	0.005358	0.004747	0.007580	10	16	113%	71%
Totals	4,381	123,445				3,587	3,941	122%	111%

GRS

GENERAL EMPLOYEES
SERVICE BASED WITHDRAWAL EXPERIENCE

Service	Actual Withdrawal	Total Count	Actual Rate	Assumed Rate		Expected Withdrawal		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	446	2,381	0.187316	0.177656	0.175000	423	417	105%	107%
2	514	3,757	0.136811	0.111791	0.118774	420	446	122%	115%
3	389	3,790	0.102639	0.095251	0.101396	361	384	108%	101%
4	313	3,949	0.079261	0.080527	0.086148	318	340	98%	92%
5	286	3,874	0.073826	0.067888	0.072887	263	282	109%	101%
6	218	3,719	0.058618	0.057273	0.061471	213	229	102%	95%
7	184	3,568	0.051570	0.048206	0.051757	172	185	107%	99%
8	163	3,437	0.047425	0.040442	0.043604	139	150	117%	109%
9	118	3,288	0.035888	0.034367	0.036868	113	121	104%	98%
10	103	3,166	0.032533	0.029375	0.031408	93	99	111%	104%
11	103	2,961	0.034786	0.025667	0.027082	76	80	136%	129%
12	77	2,707	0.028445	0.022534	0.023746	61	64	126%	120%
13	59	2,473	0.023858	0.020623	0.021259	51	53	116%	111%
14	63	2,304	0.027344	0.019531	0.019479	45	45	140%	140%
15	41	2,198	0.018653	0.018198	0.018263	40	40	103%	103%
16	36	2,077	0.017333	0.017814	0.017470	37	36	97%	100%
17	44	2,014	0.021847	0.017378	0.016956	35	34	126%	129%
18	28	1,835	0.015259	0.016349	0.016579	30	30	93%	93%
19	15	1,671	0.008977	0.016158	0.016198	27	27	56%	56%
20	22	1,537	0.014314	0.015615	0.015669	24	24	92%	92%
21	18	1,427	0.012614	0.013315	0.014851	19	21	95%	86%
22	13	1,280	0.010156	0.011719	0.013602	15	17	87%	76%
23	14	1,128	0.012411	0.008865	0.011778	10	13	140%	108%
24	7	972	0.007202	0.006173	0.009239	6	9	117%	78%
25	10	822	0.012165	0.002433	0.005841	2	5	500%	200%
Totals	3,284	62,335				2,993	3,151	110%	104%

GRS

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POLICE AND FIRE OFFICERS
SERVICE BASED WITHDRAWAL EXPERIENCE

				Assumed Rate		Expected Withdrawal		Actual/Expected	
Service	Actual Withdrawal	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	43	423	0.101655	0.100000	0.100000	42	42	102%	102%
2	41	745	0.057584	0.052800	0.047300	39	35	105%	117%
3	16	720	0.018950	0.048100	0.036903	35	27	46%	59%
4	25	718	0.032401	0.043600	0.030821	31	22	81%	114%
5	17	692	0.022831	0.039400	0.026506	27	18	63%	94%
6	20	669	0.028571	0.035400	0.023158	24	15	83%	133%
7	11	654	0.017857	0.031600	0.020424	21	13	52%	85%
8	12	614	0.019031	0.028100	0.018111	17	11	71%	109%
9	5	582	0.007233	0.024900	0.016108	14	9	36%	56%
10	2	565	0.003738	0.021900	0.014342	12	8	17%	25%
11	10	542	0.019569	0.019100	0.012761	10	7	100%	143%
12	9	483	0.017467	0.016600	0.011332	8	5	113%	180%
13	6	494	0.012739	0.014300	0.010026	7	5	86%	120%
14	4	508	0.006211	0.012300	0.008826	6	4	67%	100%
15	4	491	0.008457	0.010500	0.007714	5	4	80%	100%
16	7	497	0.014523	0.009000	0.006679	4	3	175%	233%
17	0	481	0.000000	0.007700	0.005711	4	3	0%	0%
18	0	464	0.000000	0.006700	0.004802	3	2	0%	0%
19	1	435	0.002347	0.005900	0.003944	3	2	33%	50%
20	1	404	0.002545	0.000000	0.000000	0	0	0%	0%
21	0	374	0.000000	0.000000	0.000000	0	0	0%	0%
22	0	293	0.000000	0.000000	0.000000	0	0	0%	0%
23	0	252	0.000000	0.000000	0.000000	0	0	0%	0%
24	0	214	0.000000	0.000000	0.000000	0	0	0%	0%
25	0	181	0.000000	0.000000	0.000000	0	0	0%	0%
Totals	234	12,495				312	235	75%	100%

GRS

Salary Scale Assumption
State Employees

Year	Average Long Service Increase	CPI	Productivity
2004	1.44%	3.27%	(1.83%)
2005	1.31%	2.53%	(1.23%)
2006	6.82%	4.32%	2.50%
2007	4.98%	2.69%	2.29%
2008	3.58%	5.02%	(1.44%)
2009	2.86%	(1.43%)	4.29%
2010	0.87%	1.05%	(0.19%)
2011	2.19%	3.56%	(1.37%)
2012	5.08%	1.66%	3.42%
2013	0.70%	1.75%	(1.05%)
Average	2.96%	2.37%	0.59%
Proposed	3.50%	2.75%	0.75%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	4.44%	(2.96%)	1.48%	3.00%
3	6.10%	(2.96%)	3.14%	2.75%
4	5.60%	(2.96%)	2.64%	2.75%
5	6.09%	(2.96%)	3.13%	2.75%
6	5.99%	(2.96%)	3.03%	2.75%
7	4.16%	(2.96%)	1.20%	1.25%
8	3.51%	(2.96%)	0.54%	1.00%
9	3.62%	(2.96%)	0.65%	1.00%
10	3.85%	(2.96%)	0.89%	1.00%
11	4.47%	(2.96%)	1.51%	1.00%
12	5.33%	(2.96%)	2.36%	2.25%
13	4.08%	(2.96%)	1.12%	1.00%
14	3.97%	(2.96%)	1.01%	1.00%
15	3.84%	(2.96%)	0.87%	1.00%
16	4.44%	(2.96%)	1.48%	1.00%
17	3.31%	(2.96%)	0.35%	0.75%
18	3.25%	(2.96%)	0.29%	0.75%
19	3.57%	(2.96%)	0.60%	0.50%
20	3.39%	(2.96%)	0.43%	0.50%
21	3.86%	(2.96%)	0.90%	0.50%
22	3.21%	(2.96%)	0.25%	0.25%
23	2.92%	(2.96%)	-0.05%	0.00%
24	2.99%	(2.96%)	0.03%	0.00%
25+	2.96%	(2.96%)	0.00%	0.00%

GRS

Salary Scale Assumption
Teachers

Year	Average Long Service Increase	CPI	Productivity
2004	3.39%	3.27%	0.13%
2005	4.40%	2.53%	1.87%
2006	3.29%	4.32%	(1.02%)
2007	6.14%	2.69%	3.45%
2008	3.45%	5.02%	(1.57%)
2009	2.79%	(1.43%)	4.21%
2010	2.49%	1.05%	1.44%
2011	4.06%	3.56%	0.50%
2012	1.58%	1.66%	(0.08%)
2013	(2.53%)	1.75%	(4.29%)
Average	2.91%	2.43%	0.48%
Proposed	3.50%	2.75%	0.75%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	13.13%	(2.88%)	10.25%	9.00%
3	8.82%	(2.88%)	5.94%	6.25%
4	8.36%	(2.88%)	5.47%	5.50%
5	7.92%	(2.88%)	5.03%	5.00%
6	7.78%	(2.88%)	4.90%	5.00%
7	7.28%	(2.88%)	4.40%	4.50%
8	7.02%	(2.88%)	4.14%	4.25%
9	6.81%	(2.88%)	3.92%	4.00%
10	7.23%	(2.88%)	4.35%	4.00%
11	2.88%	(2.88%)	0.00%	0.00%

GRS

Salary Scale Assumption
General Employees

Year	Average Long Service Increase	CPI	Productivity
2004	3.38%	3.27%	0.12%
2005	3.20%	2.53%	0.67%
2006	4.92%	4.32%	0.60%
2007	4.81%	2.69%	2.12%
2008	3.88%	5.02%	(1.14%)
2009	3.54%	(1.43%)	4.97%
2010	1.52%	1.05%	0.46%
2011	2.05%	3.56%	(1.51%)
2012	1.50%	1.66%	(0.17%)
2013	2.04%	1.75%	0.29%
Average	3.71%	2.43%	0.65%
Proposed	3.50%	2.75%	0.75%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	3.16%	(3.08%)	0.08%	3.00%
3	5.77%	(3.08%)	2.69%	2.75%
4	5.87%	(3.08%)	2.80%	2.50%
5	4.94%	(3.08%)	1.87%	2.25%
6	5.33%	(3.08%)	2.26%	2.00%
7	4.45%	(3.08%)	1.37%	1.25%
8	3.96%	(3.08%)	0.88%	0.75%
9	3.85%	(3.08%)	0.77%	0.50%
10	3.89%	(3.08%)	0.81%	0.50%
11	3.82%	(3.08%)	0.74%	0.25%
12	3.17%	(3.08%)	0.09%	0.25%
13	3.24%	(3.08%)	0.16%	0.25%
14	3.56%	(3.08%)	0.48%	0.25%
15	3.70%	(3.08%)	0.62%	0.25%
16+	3.08%	(3.08%)	0.00%	0.00%

GRS

Salary Scale Assumption
Police and FireFighters

Year	Average Long Service Increase	CPI	Productivity
2004	4.07%	3.27%	0.80%
2005	0.01%	2.53%	(2.52%)
2006	9.03%	4.32%	4.71%
2007	5.89%	2.69%	3.21%
2008	2.76%	5.02%	(2.26%)
2009	3.33%	(1.43%)	4.76%
2010	3.25%	1.05%	2.19%
2011	3.16%	3.56%	(0.40%)
2012	5.70%	1.66%	4.03%
2013	2.50%	1.75%	4.03%
Average	5.31%	2.43%	1.52%
Proposed	4.00%	2.75%	1.25%

Years of Service	Average Pay Increase	Less Actual Inflation and Productivity Components	Actual Step-Rate/Promotional Component	Proposed Step-Rate/Promotional Component
2	14.44%	(3.94%)	10.50%	9.00%
3	10.79%	(3.94%)	6.84%	7.00%
4	8.07%	(3.94%)	4.12%	4.00%
5	6.11%	(3.94%)	2.17%	2.50%
6	6.77%	(3.94%)	2.83%	3.00%
7	4.29%	(3.94%)	0.35%	0.50%
8	4.27%	(3.94%)	0.33%	0.50%
9	3.94%	(3.94%)	0.00%	0.00%

GRS

CORRECTIONAL OFFICERS
RETIREMENT EXPERIENCE - SERVICE BASED

Service Year	Actual Retirement	Total Count	Actual Rate	Assumed Rate		Expected Retirement		Actual/Expected	
				Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20	3	11	0.273	0.050	0.050	1	1	300%	300%
21	2	14	0.143	0.050	0.050	1	1	200%	200%
22	1	17	0.059	0.050	0.050	1	1	100%	100%
23	3	10	0.300	0.050	0.050	1	1	300%	300%
24	-	17	0.000	0.050	0.050	1	1	0%	0%
25	2	34	0.059	0.050	0.050	2	2	100%	100%
26	2	41	0.049	0.050	0.050	2	2	100%	100%
27	1	42	0.024	0.050	0.050	2	2	50%	50%
28	7	40	0.175	0.050	0.050	2	2	350%	350%
29	1	36	0.028	0.050	0.050	2	2	50%	50%
30	3	37	0.081	0.130	0.130	5	5	60%	60%
31	4	22	0.182	0.130	0.130	3	3	133%	133%
32	2	11	0.182	0.130	0.130	1	1	200%	200%
33	-	2	0.000	0.200	0.200	-	-	N/A	N/A
34	-	1	0.000	0.200	0.200	-	-	N/A	N/A
35	-	1	0.000	0.350	0.350	-	-	N/A	N/A
36	-	-	N/A	0.250	0.250	-	-	N/A	N/A
37	-	-	N/A	0.250	0.250	-	-	N/A	N/A
38	-	-	N/A	0.250	0.250	-	-	N/A	N/A
39	-	-	N/A	0.250	0.250	-	-	N/A	N/A
40	-	-	N/A	1.000	1.000	-	-	N/A	N/A
41	-	-	N/A	1.000	1.000	-	-	N/A	N/A
42	-	-	N/A	1.000	1.000	-	-	N/A	N/A
43	-	-	N/A	1.000	1.000	-	-	N/A	N/A
44	-	-	N/A	1.000	1.000	-	-	N/A	N/A
45	-	-	N/A	1.000	1.000	-	-	N/A	N/A
Total	31	336	0.092			24	24	129%	129%

GRS

POLICE AND FIRE OFFICERS
RETIREMENT EXPERIENCE - SERVICE BASED
For members who reach 20 years of service

				Assumed Rate		Expected Retirement		Actual/Expected	
Service Year	Actual Retirement	Total Count	Actual Rate	Current	Proposed	Current	Proposed	Current (2) / (7)	Proposed (2) / (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
20	39	266	0.147	0.120	0.120	32	32	122%	122%
21	39	260	0.150	0.100	0.100	26	26	150%	150%
22	19	204	0.093	0.100	0.100	20	20	93%	93%
23	14	174	0.080	0.100	0.100	17	17	80%	80%
24	17	139	0.122	0.120	0.120	17	17	102%	102%
25	15	107	0.140	0.140	0.140	15	15	100%	100%
26	16	92	0.174	0.160	0.160	15	15	109%	109%
27	12	65	0.185	0.180	0.180	12	12	103%	103%
28	11	49	0.224	0.200	0.200	10	10	112%	112%
29	9	40	0.225	0.200	0.200	8	8	113%	113%
30 or more	43	106	0.406	0.350	0.350	37	37	116%	116%
Total	234	1,502	0.156			209	209	112%	112%

GRS