Teachers' Pension and Annuity Fund of New Jersey

Experience Study
July 1, 2009 – June 30, 2012

by

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July 1, 2009 through June 30, 2012

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Executive Summary

This report presents the results of the statistical analysis of actual experience from July 1, 2009 through June 30, 2012 among active, inactive and retired employees and their spouses and beneficiaries covered by the Teachers' Pension and Annuity Fund of New Jersey (TPAF). This study is intended to comply with Title 18A, Subtitle 10, Chapter 66, Section 58. This statute requires that at least once in every 3-year period the actuary shall make an actuarial investigation into the mortality, service and compensation or salary experience of the members and beneficiaries of the retirement system.

There are effectively four sections to the report plus two appendices:

- Section I – Executive Summary and Introduction. This section provides a brief list of the key assumption changes proposed.
- Section II - Economic Assumptions. In this section, a review of the salary increase assumption is discussed and changes proposed where appropriate. Although the investment return assumption is prescribed by the State Treasurer and the asset valuation method is specified in statute, we provide commentary on these items and recommend changes.
- Section III – Demographic Assumptions. This section presents a review of each assumption (rate of termination, retirement, mortality and disability) providing analysis on the experience observed as compared to the current assumption and proposes changes where appropriate.
- Section IV – Impact on Valuation Results displays the effect on the funded status and the statutory pension contribution as of June 30, 2013 and June 30, 2012.
- Appendix I – Demographic Data Analysis summarizes the experience observed as compared to both the current and proposed assumptions utilizing actual to expected ratios. Summaries of this information are provided throughout Section III and can be easily located using the Table Index.
- Appendix II – Proposed Assumptions displays all the assumptions proposed.

The following table provides a brief list of the key proposed assumptions.

Table 1 – Brief Summary of Proposed Assumptions	
Investment Return	The current assumption of 7.9% is outside our reasonable range and we recommend a reduction to more reasonable expectations. Our 50th percentile investment return assumption is 7%.
Asset Valuation Method	The current method has produced actuarial values that continually exceed the market value. We recommend consideration to modifying the method or a one-time reset of the actuarial value to the market value and implementing a 20% corridor in future years.
Salary	A reduction in salary increases for periods through June 30, 2021 to reflect the continuing trend of smaller increases in the short-term. No change is recommended for periods after June 30, 2021. This change will be reflected in the June 30, 2012 valuation in addition to the June 30, 2013 actuarial valuation.
Termination	Reflect the continuing trend of lower rates of termination for members with at least 5 years of service. Also reflect actual experience among non-contributory members who are eligible for a benefit, but who elect a refund of contributions versus a deferred retirement benefit.
Retirement	Slight increase in retirement rates for members who have completed 25 years of service and a decrease in rates for members with less than 25 years of service.
Disability	Slight change in rates for male members between ages 50 and 67.
Pre-retirement Mortality	No change recommended at this time.
Postretirement Mortality	No change in the mortality rates for healthy members. A decrease in mortality rates for disabled members.
Mortality Improvement	The number of years of mortality improvement subsequent to the valuation date to be included in the actuarial valuation is 7 years for postretirement and 15 years for preretirement. This is a change from the current generational approach.

The result of the proposed demographic assumptions is a slight decrease in the plan's actuarial accrued liability as of June 30, 2013 of 0.8%; increasing the funded ratio on an actuarial value basis from 57.7% to 58.2% and a market value basis from 50.9% to 51.3%. The net impact on the full statutory pension contribution for the fiscal year ending June 30, 2015 is a decrease of $57.5 million from $2,364.1 million to $2,306.6 million and on a Chapter 1, P.L. 2010 phased-in basis, a decrease of $32.7 million.

In addition, the modification of the salary increase assumption decreased the full statutory pension contribution by $31.3 million ($13.4 million on a phased-in basis) for the fiscal year ending June 30, 2014.

Please note that the assumptions developed in this report are intended to value pension benefits for all members participating in the Teachers' Pension and Annuity Fund. Use of these assumptions may not be appropriate for other purposes or any one subset of the membership.

Milliman's work is prepared solely for the internal business use of the State of New Jersey Division of Pension and Benefits. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exception:

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

In performing this analysis, we relied, without audit, on census data, plan provisions, asset statements and other information (both written and oral) provided by the State of New Jersey Division of Pensions and Benefits. We have not audited or verified the census data, asset statements or other information. To the extent any of these are inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

Future actuarial measurements may differ significantly from the current measurements presented in this analysis due to actual plan experience deviating from the actuarial assumptions, and changes in plan provisions, actuarial assumptions, and applicable law. An assessment of the potential range and cost effect of such differences is beyond the scope of this analysis.

We are members of the American Academy of Actuaries and meet its Qualification Standard to render this actuarial opinion.

Respectfully submitted,

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Introduction

This report presents the results of the statistical analysis of actual experience from July 1, 2009 through June 30, 2012 among active, inactive and retired employees and their spouses and beneficiaries covered by the Teachers' Pension and Annuity Fund of New Jersey (TPAF). This study is intended to comply with Title 18A, Subtitle 10, Chapter 66, Section 58 which requires that at least once in every 3-year period the actuary shall make an actuarial investigation into the mortality, service and compensation or salary experience of the members and beneficiaries of the retirement system.

If a retirement system is to operate on a sound actuarial basis, the funds on hand together with the value of expected future employee, district and state contributions must be adequate to cover the value of future expected benefit payments. The determination of the value of expected future contributions and the value of expected future benefit payments involves projections based on anticipated future rates of mortality, withdrawal, disability, and retirement as well as rates of investment income and salary growth. In these projections, it is assumed that a certain proportion of the members of TPAF will terminate, die, retire or become disabled each year. Moreover, benefits are determined for each of these occurrences based on assumptions regarding the rate at which salaries will increase in the future. The value of these benefits are then calculated based on an assumed life expectancy for retirees, surviving spouses and other beneficiaries and the assumed long-term yield on plan assets. At three-year intervals an analysis is made to evaluate the experience under TPAF in order to revise, where necessary, those assumptions that are no longer in line with recent experience and/or best estimates of anticipated future experience.

In many cases of statistical analysis, the greater the volume of data analyzed the more reliable the results. This is not necessarily true in evaluating the experience of the members of a retirement system if this involves extending the study over long periods of

time. For example, consider mortality experience among retirees. Twenty years ago the mortality rates at each age were considerably higher than the corresponding rates of mortality in more recent years. Thus, to include the experience of twenty years ago in a study of mortality rates would produce rates higher than are currently being experienced and can be expected to be experienced in the future. The use of mortality rates from even 10 or more years ago could understate life expectancy and hence contributions.

The experience from July 1, 2009 through June 30, 2012 served as a basis for this study. In a system as large as TPAF, three years of experience is generally adequate for statistical purposes. Please note that due to the significant changes in salary increases over the past few years, we also incorporated an additional year of salary experience (July 1, 2012 to June 30, 2013) in the salary analysis. We also reviewed prior experience studies in order to identify long term trends in the experience. This search from a longer-term historical perspective is the final step of the process before developing assumptions that can serve as best estimates of future experience. Our objective is to avoid frequent changes in assumptions due to random fluctuations in experience while reflecting any emerging long-term trends. One method used to accomplish this is to recommend revised assumptions, which fall between the prior assumptions and the actual experience during the current study period. This avoids frequent, sharp fluctuations in assumptions and costs while recognizing any emerging trends in the underlying plan experience.

In the 2009 study, we were unsure if the experience observed from July 1, 2006 through June 30, 2009 was indicative of long-term anticipated future experience due to the Great Recession of 2008. In this study, we reviewed the results of this study along with the 2009 and 2006 studies to determine if new trends were emerging or if the experience in the last study was an anomaly. We found in some cases that experience from the 2012 study continued a pattern emerging from the 2009 study and other cases

where experience was closer to the 2006 study. Thus in many instances, our recommendations are based on the past 9 years of experience analysis.

As an aid in reviewing the detailed results of the evaluation as set forth in the following sections of this report, the following paragraphs review, in general terms, the effect of the various items of actuarial assumptions on the actuarial valuation. As noted above, an actuarial valuation involves a projection of the salaries and service of present members of the system and a determination of the value of the expected benefits payable to them.

Thus, if many members die or terminate before becoming eligible for benefits, required contributions to the fund will be smaller than if members experience lower mortality or turnover. Or if members experience shorter life expectancies after commencement of the pension, required contributions would be reduced. Similarly, a high investment yield will mean greater expected investment income so that there is a corresponding reduction in required contributions today.

The overall reasonableness and consistency of the various actuarial assumptions is therefore a consideration. However, if as time passes each element in the actuarial assumptions moves further from actual experience, it is difficult to tell whether the assumptions are reasonable on an overall basis. Thus, it may be stated that one objective of the current analysis is to bring each element of the actuarial assumptions more in line with recent experience, especially those areas regarding demographic trends - withdrawal, disability, retirement and death.

Economic Assumptions

Investment Return Assumption

Current Assumption

The investment return assumption is prescribed by the State Treasurer. It was 8.25% as of the last experience study conducted in 2010, reduced to 7.95% in the 2011 valuation and further reduced to 7.90% in the 2012 valuation. The modifications reflect lower expected average annual future investment returns over a long time horizon.

Analysis

Recent GFOA guidance[1] reaffirmed that pension costs should be funded in an equitable and sustainable manner. Making a prudent effort to allocate costs over an employee's period of active service creates equity between generations of taxpayers, and enhances both retiree benefit security and sustainability for future employees by avoiding systematic underfunding or overfunding of the current program.

The core elements of an actuarially determined contribution are the cost allocation method, the asset smoothing approach, and the amortization period. These core elements are combined with actuarial assumptions that are both demographic and economic in nature. The purpose of the actuarial valuation is to combine these elements to estimate a pattern of stable contributions to be made in the current year and future years to cover the benefits promised by the plan in an equitable and sustainable manner.

The investment return assumption in most cases is the most important assumption in

1 GFOA *Guidelines for Funding Defined Benefit Pensions* (2013)

determining a reasonable contribution pattern because it determines the present value of expected benefit payments to all members of the system. Nearly 63% of the liability is attributable to benefits for current retirees and beneficiaries. Given the projected absence of cost of living increases in future years, there are two key assumptions that impact the liability for the retiree group. One is demographic (mortality or life expectancy) and one is economic (investment return).

The mortality assumption is discussed further in this report and estimates the payout period for current and future retirees. The assumption is set based on experience of TPAF retirees combined with observed long-term trends toward progressively higher life expectancies for society as a whole due to medical advances. We believe this approach adheres to GFOA's principles of equitability and sustainability.

The investment return assumption estimates the average future earnings on currently invested fund assets and future contributions to the fund. To the extent that actuarial assumptions are optimistic in nature, the greater likelihood that actuarial losses will occur and actuarially determined contributions will increase in future years and potentially not adhere to GFOA's principles of equitability and sustainability.

Based on TPAF's actual investment allocation as of November 30, 2012, our best estimate (50^{th} percentile) return assumption is 7% and our reasonable range is 6.10% - 7.85% (25^{th} to 75^{th} percentiles). The reasonable range is defined as the range where actual results compounded over the measurement period are more likely than not to fall. The current assumption of 7.9% is outside our reasonable range.

Asset Valuation Method

A core element in determining an actuarially determined contribution is the asset valuation method. An asset valuation method determines the actuarial value of assets, which is used to measure the plan's unfunded liability for use in calculating the employer contribution for that year. Since investment returns can vary widely from one year to the next, the purpose of an asset valuation method is to smooth these returns over a period of time such that actuarially determined contributions do not vary significantly from one year to the next.

The asset smoothing method used for TPAF is prescribed by statute and recognizes 20% of the difference between the expected Actuarial Value of Assets (smoothed value) and the market value of assets. This method recognizes investment losses (or gains) very slowly as it always recognizes 20% of the difference. Thus, a loss in any one year is not fully recognized until a gain is experienced to offset it. In approximately 10 years, 90% of a loss (or gain) in any one year is recognized if there is no corresponding gain (or loss) to offset it. This method is referred to as an asymptotic method and can work well when there are investment gains and losses that offset each other.

One quality of a reasonable asset valuation method is that it is likely to produce actuarial values that are sometimes greater and sometimes less than the corresponding market values. In 2001, the actuarial value of assets was reset on a fresh start basis to the market value of assets retroactively to June 30, 1999, when asset values were at a peak. Due to this fresh start and significant investment losses that have occurred since 2001, TPAF has experienced twelve (12) straight years of asset losses on an actuarial value of asset basis and actuarial values have consistently exceeded corresponding market values. The following chart displays the investment returns on a market and actuarial value basis as well as the ratio of the actuarial value of assets to the market value of assets since 2001. Please note that an actuarial loss occurs when the rate of

return on the actuarial value of assets is less than the assumed rate of return. During this period the assumed rate of return has been 8.75% for periods ending prior to June 30, 2004, 8.25% for subsequent periods ending prior to June 30, 2011 and 7.95% for the period ending June 30, 2012.

Plan Year Ending June 30	Approximate Investment Return on Market Value	Approximate Investment Return on Actuarial Value	Ratio of Actuarial Value to Market Value
2001	-9.70%	5.47%	114.6%
2002	-8.25%	2.98%	129.6%
2003	2.97%	2.79%	131.0%
2004	14.22%	4.32%	121.0%
2005	8.84%	4.50%	117.2%
2006	10.30%	5.35%	112.5%
2007	15.95%	7.15%	104.3%
2008	-2.27%	5.31%	112.9%
2009	-16.29%	1.36%	139.0%
2010	13.83%	2.74%	128.6%
2011	17.91%	4.71%	116.3%
2012	2.46%	3.85%	119.4%
12-Year Average	3.58%	4.20%	120.5%

Combining an optimistic investment return assumption with a current actuarial value of assets that significantly exceeds the market value of assets, along with the current asset smoothing method which recognizes investment losses very slowly, will result in upward pressure on actuarially determined contribution requirements in future years. We believe that this systematic deferral of employer contributions will not adhere to GFOA's principles of equitability and sustainability.

Proposed Assumption

As stated earlier, the investment return assumption is the most important assumption in determining a reasonable contribution pattern. A small change in the investment return assumption can have a significant impact on the actuarial liabilities and thus, the statutory contributions. Steps have been taken in the last two years to reduce the assumption, but we believe further steps are warranted. We recommend that an approach be specified to continue to decrease the investment return assumption to more reasonable expectations. Although we recommend a significant reduction in the assumption to occur immediately, we understand that an approach can consist of incremental decreases over the next few years. Considering the phase-in of the statutory contribution under Chapter 1, P.L. 2010, this would help mitigate the impact of contribution increases in any one fiscal year.

Further, we believe consideration should be given to modifying the asset valuation method or implement a one-time reset of the actuarial value of assets to the market value of assets. We believe the current method has not worked well during the past 12 years due to the fresh start to a market peak and circumstances subsequent to that event. We believe the current asset method can work well in future years if the actuarial value is moved closer to market value and a corridor is implemented to limit the percentage by which the actuarial value can deviate from the market value. We recommend a corridor of no larger than 20%.

Effect on Plan's Liability

Reducing the investment return assumption and/or modifying the asset valuation method that results in a decrease in the actuarial value of assets will result in an increase in the unfunded actuarial liability and the near-term statutory contributions. Determining results at an alternate investment return assumption is outside the scope of our assignment.

Salary Increase Assumption

Current Assumption

Since the prior experience study conducted in 2009, the salary growth assumption was modified in the 2011 and 2012 actuarial valuations to reflect lower expected salary increases than the assumption recommended in the 2009 study. Our objective in setting actuarial assumptions is to avoid frequent changes due to random fluctuations in experience while reflecting long-term trends. However, if we believe short-term experience would be different than long-term expectations, these differences can be reflected to minimize actuarial gains or losses in the short-term.

To that end, the salary scale used in the 2012 actuarial valuation dated February 15, 2013 reflects:

- Lower expected salary increases until June 30, 2016 based on average increases from 2011 and 2012 plan years (expectation of 3.7% on average)
- Slightly higher increases for the following five years until June 30, 2021 based on average increases from 2010 – 2012 plan years (expectation of 4.1% on average)
- Long-term assumption based on average increases from 2009 – 2012 plan years (expectation of 4.7% on average)

Analysis

In reviewing the experience during the year ending June 30, 2013, there was a continued trend of lower than expected salary increases. For the 2012 and 2013 plan years, the average increase was 3.3%, on average, versus the expectation of 3.7%, on average.

Proposed Assumption

The proposed assumption is to reduce the salary increase assumption effective with the June 30, 2012 valuation for the remaining 9-year select period to further reflect the most recent experience. The average proposed salary increase assumption for the select period ending June 30, 2016 is 3.33% reflecting the experience for the two-year period ending June 30, 2013. The average proposed salary increase assumption for the select period for the following five years until June 30, 2021 is 3.86% reflecting the experience for the four-year period ending June 30, 2013. The following table displays salary experience used in the analysis along with the proposed assumption.

In addition, the inflation assumption and the Social Security Taxable Wage Base increase assumption were lowered 0.25% from 3% to 2.75% and 4% to 3.75%, respectively in conjunction with the 2012 valuation.

Effect on Plan's Liability

The proposed assumption reduces expected salary and projected benefits from the assumptions used in the initial 2012 valuation, which will result in a decrease in the plan's liability.

Table 2 - Summary of Salary Increase Experience and
Recommended and Current Total Salary Increase Assumptions (wage inflation + merit scale)

Completed Years of Service	Average Salary Increase During Fiscal Year ending					Recommended Assumptions		
	2009	2010	2011	2012	2013	Prior to June 30, 2016	July 1, 2016 to June 30, 2021	Thereafter
less than 1	6.31%	6.64%	3.78%	3.33%	3.18%	3.80%	4.30%	5.40%
1	5.43%	5.50%	4.33%	3.66%	3.90%	3.80%	4.30%	5.40%
2	5.28%	4.96%	3.67%	3.77%	4.16%	3.80%	4.30%	5.40%
3	5.08%	4.98%	3.82%	3.47%	3.58%	3.80%	4.30%	5.40%
4	5.10%	5.34%	3.96%	3.57%	3.79%	3.80%	4.30%	5.40%
5	5.59%	5.45%	4.29%	3.83%	3.95%	3.80%	4.30%	5.40%
6	5.47%	5.65%	4.45%	3.81%	3.79%	3.80%	4.30%	5.40%
7	5.51%	5.74%	4.42%	3.94%	3.84%	3.80%	4.30%	5.40%
8	5.82%	5.67%	4.59%	4.03%	3.92%	3.80%	4.30%	5.40%
9	6.17%	6.21%	4.77%	4.17%	4.30%	4.35%	5.05%	5.95%
10	6.37%	6.35%	4.97%	4.43%	4.30%	4.35%	5.05%	5.95%
11	6.41%	6.51%	5.11%	4.46%	4.56%	4.35%	5.05%	5.95%
12	6.50%	6.50%	5.26%	4.36%	4.17%	4.35%	5.05%	5.95%
13	6.01%	6.23%	4.75%	4.15%	4.12%	4.10%	4.80%	5.80%
14	5.37%	5.97%	4.59%	3.85%	4.06%	3.95%	4.65%	5.45%
15	4.89%	5.44%	4.31%	3.83%	4.05%	3.95%	4.45%	5.05%
16	4.50%	5.08%	3.88%	3.37%	3.32%	3.30%	3.90%	4.50%
17	4.32%	4.71%	3.51%	3.25%	3.02%	3.15%	3.65%	4.15%
18	3.89%	4.31%	3.38%	2.83%	2.90%	2.85%	3.35%	3.95%
19	3.98%	4.29%	2.95%	2.70%	2.69%	2.70%	3.20%	3.70%
20	3.32%	3.80%	3.07%	2.48%	2.57%	2.50%	3.00%	3.60%
21	3.29%	3.74%	2.60%	2.39%	2.37%	2.35%	2.75%	3.25%
22	3.27%	3.30%	2.54%	2.06%	2.20%	2.10%	2.50%	3.10%
23	3.27%	3.52%	2.24%	2.03%	2.07%	2.00%	2.40%	2.95%
24	3.19%	3.38%	2.35%	1.94%	1.92%	2.00%	2.40%	2.95%
25	3.12%	3.37%	2.28%	1.89%	2.13%	2.00%	2.40%	2.95%
26	2.87%	3.27%	2.15%	1.93%	1.74%	1.80%	2.20%	2.80%
27	2.81%	3.19%	2.31%	1.94%	1.85%	1.80%	2.20%	2.80%
28	2.80%	3.05%	2.11%	2.01%	1.66%	1.80%	2.20%	2.80%
29	2.93%	3.04%	2.13%	1.95%	1.70%	1.80%	2.20%	2.80%
30	2.89%	2.90%	2.19%	1.93%	1.58%	1.80%	2.20%	2.80%
31	2.51%	2.86%	1.98%	1.73%	1.70%	1.75%	2.05%	2.50%
32	2.71%	2.84%	2.20%	1.63%	1.71%	1.75%	2.05%	2.50%
33	2.54%	2.82%	2.09%	1.75%	1.45%	1.75%	2.05%	2.50%
34	2.56%	2.88%	1.92%	1.59%	1.56%	1.75%	2.05%	2.50%
35	2.68%	2.77%	1.99%	1.83%	1.41%	1.75%	2.05%	2.50%
36	2.58%	2.67%	1.92%	1.73%	1.62%	1.75%	2.05%	2.50%
37	2.64%	2.79%	2.08%	1.65%	1.24%	1.75%	2.05%	2.50%
38	2.75%	2.67%	1.87%	1.94%	1.49%	1.75%	2.05%	2.50%
39	2.71%	2.83%	2.00%	1.42%	1.28%	1.75%	2.05%	2.50%
40	2.96%	2.60%	2.52%	2.09%	1.65%	1.75%	2.05%	2.50%
Average	4.61%	4.81%	3.73%	3.30%	3.30%	3.33%	3.86%	4.67%

Demographic Assumptions

We determined the proposed demographic assumptions in accordance with the Actuarial Standards of Practice No. 35 (ASOP 35) revised by the Actuarial Standards Board in September of 2010. This standard provides guidance to actuaries in selecting demographic assumptions – primarily retirement, mortality, termination of employment and disability – for measuring obligations under defined benefit pension plans. A reasonable assumption is one that is expected to approximately model the contingency being measured and is not anticipated to produce significant gains or losses.

The general procedure in a study of demographic experience is to calculate rates of decrement and compare these rates to current assumptions. Initially, we determine the number of participants who were exposed to the risk of mortality, withdrawal, disability, etc. The next step is to determine how many actually died, withdrew, became disabled, etc. Dividing the number of terminations in each age and service cell by the number exposed to the risk of termination in that cell produces the rate of decrement. These crude rates of decrement may fluctuate from cell to cell. If there is a tendency for rates to increase (or decrease) by age or service we smooth or "graduate" them in order to provide rates of decrement with a more uniform progression. For all of the decrements we reviewed, we first compared the results to the current rates to determine if a change in assumptions was necessary. If a change in the current assumption did not fit recent experience we developed proposed rates which were either based directly on the graduated rates, an average of graduated rates from prior experience studies or on an average between the current rates and the graduated rates. We believe that a long-term approach which averages recent experience and prior assumptions avoids over-reacting to short-term, random fluctuations while assuring that the assumptions will be gradually modified to the extent that the long-term underlying trend has changed.

The rates of decrement are applied to the number of exposures in order to obtain the

expected number who will terminate from the particular cause under study. The actual number of terminations is compared to the expected number of terminations under the current actuarial assumptions and, if a change is proposed, under the new assumptions in order to obtain the ratio of actual to expected (A/E ratio). This A/E ratio provides an overall comparison between the actual decrements (due to death, withdrawal, disability, etc.) with the expected number of decrements based on the actuarial assumptions from the cause of decrement in question. An A/E ratio greater than 1.0 indicates that there were more actual decrements than expected during the study period and an A/E ratio of less than 1.0 indicates that there were fewer actual decrements than expected during the study period.

In the following pages, each decrement is reviewed for its appropriateness. Our analysis will include information about the current assumption, an analysis of experience observed in the current study period and a discussion on proposed changes to the assumptions.

Non-Contributory Members

The Division of Pensions and Benefits provides data for each annual valuation that identify non-contributory members. Many of these members are, in reality, members who have terminated employment or have applied for retirement or disability, etc., but whose paperwork was not completed in time to be included with the valuation data. Others are members who have ceased active service, but choose to let their contributions remain in the system so they could return to service at a later date or apply for a pension when they become eligible.

We reviewed the experience among the non-contributory members since the last study period to estimate the extent which these members are likely to (1) return to active service, (2) elect a refund of their contributions, or (3) wait until they become eligible to collect a pension and apply for retirement at that time. All data was reviewed to determine the status reported for these non-contributing members in subsequent years. That analysis indicated that approximately 20% of the current non-contributory members would return to active status. This is a decrease from the prior assumption of 30%. For those assumed to return to active status, a projected benefit is valued.

For members who became non-contributing members during the study, approximately 25% are assumed to be rehired. Among the 75% who are not expected to return to active status, a percentage of these members were assumed to have become disabled (1.0%), have died (0.6%) or have terminated employment (98.4%). These assumptions are slightly less than those used in the prior study and reflect experience among the non-contributing members since 1997. Among those who terminated employment, if the member was eligible for a retirement benefit, they were assumed to have retired. If the member was eligible for a deferred vested benefit, it was assumed that the member would elect the deferred vested benefit 85% of the time. Previous studies assumed all eligible members would elect a deferred vested benefit, but the assumption was

modified after a review of the historical experience of non-contributing members who elected a refund. All other members were assumed to elect a refund of their contributions.

Rate of Termination

Current Assumption

The current termination assumption consists of three components:

- Higher rates of turnover prior to attainment of 10 years of service that vary by service, gender and for females, age too
- An assumption for those with 10 or more years of service electing a benefit that varies by service, age and gender
- An assumption for those with 10 or more years of service electing a contribution refund that varies by service, age and gender

Once an employee becomes eligible for reduced or unreduced retirement, the assumption is that the member will no longer leave under the withdrawal decrement. He or she will only retire as a healthy retiree, disabled retiree or die during active service.

Analysis

Similar patterns of terminations were observed in this analysis as in previous studies. Specifically, the rates of withdrawal among shorter service members vary significantly with service whereas withdrawal rates among longer service members vary by service and age.

For members with less than 5 years of service, actual experience was higher than expected and actual experience was lower than expected for members between 5 and 10 years of service. For female members with less than 10 years and at least age 40,

actual experience was higher than expected.

For members with at least 10 years of service, experience for male members was 5% less than assumed and experience for female members was 20% less than assumed.

There was also the continuing trend of members with 10 or more years of service to continue to leave their contributions in the system and elect a deferred vested benefit. Reflecting that 15% of eligible non-contributing members do elect a refund, the percentage of members who elected a refund versus a deferred benefit was 20% for female members and 28% for male members versus the current assumption of 9% and 26%, respectively.

Proposed Assumption

Our proposed assumptions are based on an average of 9 years of actual experience for members with less than 10 years of service. For 10 or more years of service, our proposed assumption is based on an average of 6 years of actual experience along with the current assumption as the rates of termination at the new service splits was not available in the 2006 study.

In addition, we increased the percentage of members assumed to elect a refund to reflect the actual experience of non-contributing members over the past decade. The percentage of members assumed to elect a refund decreases as members get older.

The following table summarizes the actual to expected ratios (A/E ratios) for males and females by service based on the current and proposed assumptions. Refer to Appendix A for a more detailed analysis of these ratios.

Table 3 – A/E Ratios for Rates of Termination				
Completed Years of Employment	Male		Female	
	Current	Proposed	Current	Proposed
0	1.55	1.32	1.71	1.26
1	1.39	1.16	1.18	1.12
2	1.48	1.19	1.27	1.12
3	1.33	1.13	1.12	1.07
4	0.99	0.99	0.90	0.96
5	1.02	1.02	0.83	0.90
6	0.86	0.99	0.74	0.86
7	0.87	1.02	0.69	0.82
8	0.89	0.97	0.60	0.76
9	0.84	1.02	0.73	0.83
Total 0 – 9	1.19	1.11	0.96	0.99
10-14	0.89	1.00	0.81	0.94
15-19	0.98	1.00	0.78	0.92
20-24	1.29	1.29	0.70	0.83
10+ total	0.95	1.03	0.80	0.92
10+ electing a refund	1.05	1.00	1.87	1.04
10+ electing a benefit	0.92	1.04	0.70	0.90

Effect on Plan's Liability

Overall, the proposed assumptions decrease the expected number of terminations, which increase the plan's liability since more members would be expected to be eligible for service retirement. This is somewhat offset by the increase in the number of members assumed to elect a refund versus a benefit upon termination.

Rate of Retirement

Current Assumption

The current retirement assumption consists of four components:

- A higher rate of retirement at first eligibility for an unreduced pension benefit and postretirement medical benefits (attainment of age 55 and 25 years of service for Class B employees) that varies by age and gender
- Rates of retirement that vary by age and gender subsequent to attainment of first eligibility
- Rates of retirement that vary by age and gender for an unreduced pension benefit and prior to eligibility for postretirement medical benefits (attainment of age 60 and less than 25 years of service for Class B employees)
- Separate rates of retirement that vary by age and gender for members eligible for a reduced pension benefit and postretirement medical benefits (completion of 25 years of service prior to age 55 for Class B employees)

In addition, there are several new classes of employees with unreduced benefits at later ages or higher reductions upon early retirement. Since these new classes only apply to recent or new hires, the current assumptions are based on the assumptions for Class B employees with modifications to reflect the different retirement eligibility and early retirement reduction provisions.

Analysis

The retirement experience varied based on the four components of retirement:

- Upon first eligibility, actual experience was higher than expected by 6% for male members and 17% for female members
- Subsequent to first eligibility, actual experience was higher than expected by 8% for male members and 15% for female members

- For retirement prior to completion of 25 years of service, actual experience was lower than expected by 18% for male members and 32% for female members.
- For early retirement, actual experience was lower by 6%.

Proposed Assumption

Our proposed assumptions are based on an average of 9 years of actual experience along with the current assumption. Our proposed assumptions reflect an increase to the rates for members with at least 25 years of service and a decrease to the rates for members with less than 25 years.

The following table summarizes the actual to expected ratios (A/E ratios) for males and females by retirement category for all ages combined based on the current and proposed assumptions. Refer to Appendix A for a more detailed analysis of these ratios.

Table 4 – A/E Ratios for Rates of Retirement

Retirement Category	Eligibility	Male		Female	
		Current	Proposed	Current	Proposed
First Eligibility	First attain age 55 and 25 years	1.06	1.03	1.17	1.14
Ultimate	After attainment of age 55 and 25 years	1.08	1.07	1.15	1.10
Other	Attainment of age 60, but less than 25 years	0.82	0.95	0.68	0.84
Reduced (unisex)	>25 years, less than age 55	0.94	0.94	0.94	0.94

New Tiers

Based on adjustments to the assumptions proposed for Class B employees, similar adjustments are proposed for other classes of employees.

Effect on Plan's Liability

The proposed assumptions slightly increase the expected number of retirements for members with 25 or more years of service and decrease the expected number of retirements for members with less than 25 years of service. We would expect minimal change in the plan's liability.

Rate of Mortality for Employees

Current Assumption

The current mortality assumption for active members varies by age and gender. It is based on the RP-2000 Employee Male and Female tables with White Collar adjustments setback 5 years for males and 10 years for females. Furthermore, mortality improvements are projected on a generational basis using Scale AA. No accidental deaths are assumed.

Analysis

There continues to be a significant reduction in the number of deaths of active members. There is sometimes a reporting delay such that members are coded as non-contributory members in one valuation and an ordinary death in a subsequent valuation. In reality, the member was a death from active status. This delay in reporting is accounted for in the A/E ratios shown below. In addition, there are members who have died within one year of retirement who have not been included in the post-retirement mortality study, which would increase the A/E ratios shown below.

The number of deaths experienced during the study period is significantly less than prior periods.

Proposed Assumption

We do not believe the amount of deaths is credible experience in setting the mortality assumption for active employees. The current assumption is lower than standard mortality tables for active employees and projects improvements for 15 years subsequent to the valuation date (see postretirement mortality section for discussion on mortality improvement). At this time, we do not recommend any change to the current assumption.

The following table summarizes the actual to expected ratios (A/E ratios) for males and females for all ages combined based on the current and proposed assumptions. Refer to Appendix A for a more detailed analysis of these ratios.

Table 5 – A/E Ratios for Rates of Ordinary Death			
Male		Female	
Current	Proposed	Current	Proposed
0.73	0.73	0.86	0.86

Effect on Plan's Liability

Since there is no change in the assumption, there is no change in the liability.

Rate of Disability

Current Assumption

The disability termination assumption consists of two components:

- Rates of ordinary disablement that vary by age and gender (attainment of 10 years of service is required)
- Rates of accidental disablement that vary by gender

The current ordinary disability assumption is not assumed to apply once the member is eligible for an unreduced retirement benefit and postretirement medical benefits (attainment of age 55 and 25 years of service for Class B employees). If a member is eligible for a reduced retirement benefit, the greater of the reduced benefit and the disability benefit is valued.

Analysis

In total, actual ordinary disabilities were slightly higher than expected for male members and lower for female members. In reviewing the experience further, we noticed that very few members eligible for early retirement elected a disability retirement. These members are eligible for postretirement medical benefits so if the retirement benefit with a reduction is greater than the disability benefit, the member would elect early retirement. We believe this is the primary reason that the experience for female members is less than expected.

Accidental disabilities were very close to that expected and consistent with experience over the past 4 experience studies.

Proposed Assumption

We propose the following modifications to the current assumptions:

- A small increase to the rate of ordinary disabilities for male members between ages 50 and 67.
- No change in the rate of ordinary disabilities for female members.
- No change to the accidental disability rates.

The following table summarizes the actual to expected ratios (A/E ratios) for males and females by disability category for all ages combined based on the current and proposed assumptions. Refer to Appendix A for a more detailed analysis of these ratios.

Table 6 – A/E Ratio for Rates of Disability

Disability Category	Male		Female	
	Current	Proposed	Current	Proposed
Ordinary	1.15	0.96	0.82	0.82
Accidental	0.95	0.95	1.03	1.03

Effect on Plan's Liability

We would expect a minimal increase in the plan's liability.

Rate of Postretirement Mortality

Current Assumption

The current mortality assumption for members collecting a benefit consists of three components:

- Mortality rates for retirees collecting a service retirement benefit and all beneficiaries that vary by age and gender (for males, the Society of Actuaries RP-2000 Annuitant Mortality Table with White Collar adjustments served as the basis for the assumption and for females, the 1994 Uninsured Pensioner Mortality Table served as the basis for the assumption)
- Mortality rates for retirees collecting a disability retirement that vary by age and gender (RP-2000 Disabled Annuitant Mortality Table)
- A generational approach towards future mortality improvements for healthy retirees and beneficiaries (Scale AA)

Analysis

We reviewed the mortality experience weighted by the amount of the pension benefit in addition to by the number of retirees. In pension plans, if assumed mortality rates are set based on incidence, and if members with the larger benefits have lower mortality rates than those with smaller benefits, an actuarial loss would occur due to this bias. Weighting the rates of mortality by benefits would adjust the analysis for this bias. The A/E ratios weighted both by benefits and by counts have improved since the prior study, i.e. the A/E ratio has increased.

For disabled mortality, the A/E ratios were reduced from the prior study.

Actuarial Standards of Practice No. 35 states "The actuary should consider the effect of mortality improvement both prior to and subsequent to the measurement date" – section 3.5.3. Gradual and continued improvements in mortality, i.e., longer life expectancies,

have been evident over the past centuries. The Society of Actuaries Retirement Plans Experience Committee (RPEC) stated in their report on the RP-2000 Mortality Table ". . . RPEC recommends that, in view of the long history of improvement in non-disabled mortality rates in all of these sets of data, pension valuations should take trends in long term mortality improvement into account. From a theoretical standpoint, the RPEC believes that the use of generational mortality improvement, as in the GAR-94 table, is an appropriate way of reflecting this improvement. In cases where it is not material or cost effective to incorporate generational mortality improvement into a calculation, the actuary should project mortality improvement on a comparable static basis."

As requested by the Administration, we have presented two options for incorporating future mortality improvements in the actuarial valuation process. We believe each option is reasonable and complies with Actuarial Standards of Practice. Under each option, actuarial gains and losses are not expected to occur in the actuarial valuation as mortality improvements occur because each option reflects expected mortality for that valuation year. Therefore, we would expect the A/E ratios on the base table to be approximately 1.0. The mortality improvement scale used under both options is Scale AA.

The first option continues the current generational approach in reflecting mortality improvements. Under this approach, life expectancies are expected to continually increase each year in the future (according to the assumed improvement scale). For example, the life expectancy for a member turning age 60 in 2020 would be higher than a member turning age 60 in 2013, but lower than a member turning age 60 in 2035.

The second option reflects mortality improvement subsequent to the valuation date of 7 years for post-retirement mortality and 15 years for pre-retirement mortality, which is similar to the approach used for private sector plans. Under this option, the mortality

assumption would be updated annually to maintain the 7-year and 15-year periods of mortality improvement subsequent to the valuation date, which will result in very slight increases in the plan's liability each year. Under this option for the 2013 valuation, the life expectancy for a member turning age 60 in 2020 would be higher than a member turning age 60 in 2013, but would equal the life expectancy assumed for a member turning age 60 in 2035.

After reviewing these two options, the Administration has chosen the second option, which results in a slight decrease in the Actuarial Accrued Liability as of July 1, 2013 of 0.4%.

Proposed Assumption

Since the A/E ratios have improved from the prior study, we do not propose any change to the base mortality assumption or improvement scale for healthy retirees. For disability mortality rates, we propose to reduce the adjustments to the base table to 75% for males and 90% for females from 80% and 95%, respectively.

The following table highlights the A/E ratios based on the current and proposed assumptions by gender for selected age groups. Refer to Appendix A for a more detailed analysis of these ratios.

Table 7 – A/E Ratio for Rates of Postretirement Mortality Proposed Assumption				
Weighting By	Male		Female	
	Current	Proposed	Current	Proposed
Healthy Retirees and Beneficiaries (Ages 50 and over)				
Counts	1.03	1.03	1.04	1.04
Benefits	0.98	0.98	1.00	1.00
Disabled Retirees				
Counts	0.76	0.81	0.84	0.89

Effect on Plan's Liability of Proposed Assumption

Due to the decrease in the number of years of mortality improvement reflected in the valuation, we would expect a small decrease in the plan's liability. Furthermore, we would expect a minimal increase in the plan's liability related to disability benefits.

Impact on Valuation Results

The impact of the proposed changes to the demographic assumptions on the June 30, 2013 actuarial valuation results is shown below based on the proposed assumptions, including the decrease in the number of years of mortality improvement incorporated in the actuarial valuation. Furthermore, the impact on the June 30, 2012 actuarial valuation results is shown below based on the change in the salary scale. All other changes would first be reflected in the June 30, 2013 actuarial valuation. The results below reflect the decision to apply the full amount of expected employee contributions as an offset to the State's Normal Contribution. Previously, only the first 5.5% of employee contributions offset the State's Normal Contribution.

Impact on Actuarial Valuation Results of Proposed Assumptions in 2012 Experience Study
Based on June 30, 2013 Actuarial Valuation Results
Recommended Assumptions with adjusted Mortality Improvement
($ in millions)

	Proposed Assumptions	Current Assumptions	Difference	Percentage Difference
		Funded Status Information		
Market Value of Pension Assets	$ 26,859.6	$ 26,859.6	0.0	0.0 %
Actuarial Value of Pension Assets	$ 30,469.9	$ 30,469.9	0.0	0.0 %
Actuarial Accrued Pension Liability	$ 52,366.7	$ 52,771.0	(404.3)	(0.8) %
Unfunded Pension Liability				
Based on Market Value	$ 25,507.1	$ 25,911.4	(404.3)	(1.6) %
Based on Actuarial Value	$ 21,896.8	$ 22,301.1	(404.3)	(1.8) %
Funded Ratio				
Based on Market Value	51.3 %	50.9 %	N/A	0.4 %
Based on Actuarial Value	58.2 %	57.7 %	N/A	0.5 %
		Statutory Contribution Information		
Normal Contribution (1/60th formula)	$ 308.7	327.4	(18.7)	(5.7) %
Additional Formula Contribution	71.2	74.3	(3.1)	(4.2) %
Accrued Liability Contribution	1,926.7	1,962.4	(35.7)	(1.8) %
Total Pension Contribution by Statute	$ 2,306.6	$ 2,364.1	$ (57.5)	(2.4) %
State Appropriation for Pension (Ch 1, P.L. 2010)	1,318.1	1,350.8	(32.7)	(2.4) %

Impact on Actuarial Valuation Results of Proposed Salary Scale in 2012 Experience Study
Based on June 30, 2012 Actuarial Valuation Results

($ in millions)

	Proposed Assumptions	Current Assumptions	Difference	Percentage Difference
		Funded Status Information		
Market Value of Pension Assets	$ 26,038.0	$ 26,038.0	0.0	0.0 %
Actuarial Value of Pension Assets	$ 31,079.2	$ 31,079.2	0.0	0.0 %
Actuarial Accrued Pension Liability	$ 51,194.1	$ 51,404.6	(210.5)	(0.4) %
Unfunded Pension Liability				
Based on Market Value	$ 25,156.1	$ 25,366.6	(210.5)	(0.8) %
Based on Actuarial Value	$ 20,114.9	$ 20,325.4	(210.5)	(1.0) %
Funded Ratio				
Based on Market Value	50.9 %	50.7 %	N/A	0.2 %
Based on Actuarial Value	60.7 %	60.5 %	N/A	0.2 %
		Statutory Contribution Information		
Normal Contribution (1/60th formula)	$ 315.8	326.9	(11.1)	(3.4) %
Additional Formula Contribution	72.6	74.2	(1.6)	(2.2) %
Accrued Liability Contribution	1,769.9	1,788.5	(18.6)	(1.0) %
Total Pension Contribution by Statute	$ 2,158.3	$ 2,189.6	$ (31.3)	(1.4) %
State Appropriation for Pension (Ch 1, P.L. 2010)	925.0	938.4	(13.4)	(1.4) %

Appendix A – Demographic Data Analysis

The following pages summarize the demographic data analysis used in this experience study.

Termination - Male
0 to 9 Years of Service

Exposures

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	139	585	225	7	2	1	2	0	0	0
25-29	301	1,442	1,976	2,049	1,712	1,289	737	226	14	7
30-34	170	641	800	1,023	1,248	1,588	1,973	2,301	2,162	1,803
35-39	101	351	453	467	537	696	790	937	1,081	1,371
40-44	81	245	279	333	369	412	478	551	602	716
45-49	66	203	230	232	270	331	366	405	442	443
50-54	62	148	170	195	220	288	305	331	355	398
55-59	53	153	155	166	207	249	283	323	321	337
60-64	16	28	16	1	0	0	0	0	0	0
All Ages	989	3,796	4,304	4,473	4,565	4,854	4,934	5,074	4,977	5,075

Actual

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	13	32	20	0	0	0	0	0	0	0
25-29	33	112	134	99	48	25	10	4	0	0
30-34	16	56	66	54	31	46	31	32	36	11
35-39	16	38	43	27	26	25	17	20	13	23
40-44	17	30	28	24	21	11	10	14	7	8
45-49	9	31	29	16	14	9	11	7	5	7
50-54	11	25	27	15	9	8	15	11	4	10
55-59	7	22	27	13	5	8	6	6	4	5
60-64	4	7	3	0	0	0	0	0	0	0
All Ages	126	354	376	247	153	133	100	94	70	64

Termination - Male
0 to 9 Years of Service

Expected - Current Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	11.4	39.3	13.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0
25-29	24.7	96.9	116.6	85.4	58.0	34.5	17.4	4.8	0.2	0.1
30-34	13.9	43.1	47.2	42.7	42.3	42.6	46.6	48.8	34.4	27.4
35-39	8.3	23.6	26.7	19.5	18.2	18.7	18.6	19.9	17.2	20.8
40-44	6.6	16.5	16.5	13.9	12.5	11.0	11.3	11.7	9.6	10.9
45-49	5.4	13.6	13.6	9.7	9.2	8.9	8.6	8.6	7.0	6.7
50-54	5.1	9.9	10.0	8.1	7.5	7.7	7.2	7.0	5.6	6.0
55-59	4.3	10.3	9.1	6.9	7.0	6.7	6.7	6.8	5.1	5.1
60-64	1.3	1.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Ages	81.0	255.1	253.9	186.5	154.8	130.1	116.4	107.6	79.1	77.1

Expected - Proposed Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	13.4	47.1	16.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0
25-29	29.0	116.1	145.4	99.8	58.0	34.5	15.1	4.1	0.2	0.1
30-34	16.4	51.6	58.9	49.8	42.3	42.6	40.4	41.6	31.6	22.5
35-39	9.7	28.3	33.3	22.7	18.2	18.7	16.2	17.0	15.8	17.1
40-44	7.8	19.7	20.5	16.2	12.5	11.0	9.8	10.0	8.8	9.0
45-49	6.4	16.3	16.9	11.3	9.2	8.9	7.5	7.3	6.5	5.5
50-54	6.0	11.9	12.5	9.5	7.5	7.7	6.3	6.0	5.2	5.0
55-59	5.1	12.3	11.4	8.1	7.0	6.7	5.8	5.8	4.7	4.2
60-64	1.5	2.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Ages	95.4	305.6	316.8	217.8	154.8	130.1	101.1	91.8	72.7	63.4

Termination - Male
0 to 9 Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	1.112	0.816	1.489	n/a	n/a	n/a	n/a	n/a	n/a	n/a
25-29	1.350	1.157	1.150	1.155	0.832	0.711	0.582	0.835	n/a	n/a
30-34	1.180	1.311	1.392	1.267	0.737	1.092	0.673	0.662	1.061	0.406
35-39	1.972	1.629	1.609	1.381	1.426	1.353	0.920	0.991	0.743	1.115
40-44	2.487	1.843	1.710	1.726	1.639	0.982	0.873	1.162	0.723	0.728
45-49	1.637	2.298	2.143	1.610	1.475	1.058	1.256	0.860	0.777	1.057
50-54	2.083	2.471	2.661	1.826	1.197	1.086	2.015	1.584	0.790	1.672
55-59	1.701	2.117	2.940	1.895	0.663	1.187	0.916	0.826	0.859	0.961
60-64	2.847	3.537	3.097	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	1.552	1.387	1.482	1.325	0.989	1.021	0.858	0.871	0.890	0.835

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	0.943	0.681	1.194	n/a	n/a	n/a	n/a	n/a	n/a	n/a
25-29	1.145	0.966	0.922	0.989	0.832	0.711	0.670	0.978	n/a	n/a
30-34	1.001	1.094	1.116	1.085	0.737	1.092	0.775	0.775	1.155	0.493
35-39	1.673	1.360	1.290	1.182	1.426	1.353	1.059	1.161	0.809	1.356
40-44	2.111	1.539	1.371	1.478	1.639	0.982	1.005	1.361	0.788	0.885
45-49	1.389	1.918	1.718	1.379	1.475	1.058	1.446	1.007	0.846	1.285
50-54	1.768	2.063	2.134	1.563	1.197	1.086	2.319	1.855	0.861	2.033
55-59	1.444	1.768	2.357	1.622	0.663	1.187	1.054	0.967	0.936	1.169
60-64	2.416	2.952	2.483	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	1.317	1.158	1.188	1.135	0.989	1.021	0.988	1.020	0.970	1.016

Termination - Male
10 or more Years of Service

Exposures

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	1	0	0
30-34	1,890	4	0
35-39	7,137	755	2
40-44	4,537	3,851	478
45-49	2,154	2,216	2,298
50-54	1,696	1,427	1,618
55-59	1,407	1,272	1,400
All Ages	18,822	9,525	5,796

Actual

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	1	0	0
30-34	14	0	0
35-39	56	6	0
40-44	47	17	3
45-49	27	13	15
50-54	22	18	8
55-59	31	16	13
All Ages	196	69	39

Termination - Male - Return of Contributions
10 or more Years of Service

Exposures

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	1	0	0
30-34	1,890	4	0
35-39	7,137	755	2
40-44	4,537	3,851	478
45-49	2,154	2,216	2,298
50-54	1,696	1,427	1,618
55-59	1,407	1,272	1,400
All Ages	18,822	9,525	5,796

Actual

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	0	0	0
30-34	4	0	0
35-39	24	2	0
40-44	15	5	0
45-49	6	5	4
50-54	4	6	3
55-59	4	3	2
All Ages	57	21	8

Termination - Male - With Benefit
10 or more Years of Service

Exposures

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	1	0	0
30-34	1,890	4	0
35-39	7,137	755	2
40-44	4,537	3,851	478
45-49	2,154	2,216	2,298
50-54	1,696	1,427	1,618
55-59	1,407	1,272	1,400
All Ages	18,822	9,525	5,796

Actual

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	1	0	0
30-34	10	0	0
35-39	31	4	0
40-44	31	12	2
45-49	22	7	11
50-54	18	12	6
55-59	27	13	11
All Ages	139	48	30

Termination - Male - With Benefit
10 or more Years of Service

Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.0	0.0	0.0
30-34	25.8	0.0	0.0
35-39	93.5	6.6	0.0
40-44	41.5	24.7	1.9
45-49	17.0	12.6	8.7
50-54	17.2	10.4	7.8
55-59	24.2	15.9	11.6
All Ages	219.2	70.2	30.0

Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.0	0.0	0.0
30-34	20.6	0.0	0.0
35-39	74.8	5.3	0.0
40-44	41.5	24.6	1.9
45-49	17.0	12.6	8.7
50-54	17.2	10.5	7.8
55-59	24.2	15.8	11.6
All Ages	195.3	68.9	30.0

Termination - Male - Return of Contributions
10 or more Years of Service

Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.0	0.0	0.0
30-34	10.1	0.0	0.0
35-39	33.1	2.2	0.0
40-44	12.6	7.4	0.5
45-49	4.1	3.0	2.1
50-54	2.3	1.4	1.0
55-59	1.3	0.8	0.6
All Ages	63.4	14.9	4.3

Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.0	0.0	0.0
30-34	8.3	0.0	0.0
35-39	27.8	1.9	0.0
40-44	13.5	7.9	0.6
45-49	4.6	3.5	2.4
50-54	3.8	2.3	1.7
55-59	4.1	2.7	1.9
All Ages	62.2	18.2	6.6

Termination - Male - With Benefit
10 or more Years of Service

Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.0	0.0	0.0
30-34	15.7	0.0	0.0
35-39	60.4	4.4	0.0
40-44	28.9	17.3	1.4
45-49	12.9	9.6	6.6
50-54	15.0	9.1	6.8
55-59	22.9	15.0	11.0
All Ages	155.8	55.3	25.8

Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.0	0.0	0.0
30-34	12.3	0.0	0.0
35-39	47.0	3.4	0.0
40-44	28.0	16.7	1.3
45-49	12.4	9.1	6.3
50-54	13.4	8.1	6.1
55-59	20.0	13.2	9.7
All Ages	133.2	50.6	23.4

Termination - Male - With Benefit
10 or more Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	53.644	n/a	n/a
30-34	0.532	n/a	n/a
35-39	0.594	0.925	n/a
40-44	1.122	0.685	1.551
45-49	1.595	1.014	1.690
50-54	1.250	1.696	1.070
55-59	1.291	0.982	1.092
All Ages	0.896	0.983	1.288

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	67.055	n/a	n/a
30-34	0.665	n/a	n/a
35-39	0.743	1.158	n/a
40-44	1.122	0.686	1.548
45-49	1.595	1.011	1.687
50-54	1.250	1.692	1.073
55-59	1.291	0.983	1.090
All Ages	1.005	1.003	1.287

10 or more Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	19.934	n/a	n/a
30-34	0.373	n/a	n/a
35-39	0.739	0.789	n/a
40-44	1.228	0.688	0.822
45-49	1.373	1.748	1.813
50-54	1.613	4.214	2.563
55-59	3.291	3.626	2.555
All Ages	0.903	1.405	1.976

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	24.917	n/a	n/a
30-34	0.451	n/a	n/a
35-39	0.881	0.954	n/a
40-44	1.148	0.644	0.754
45-49	1.213	1.524	1.572
50-54	0.958	2.494	1.556
55-59	1.010	1.114	0.801
All Ages	0.921	1.146	1.270

10 or more Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	76.463	n/a	n/a
30-34	0.633	n/a	n/a
35-39	0.515	0.994	n/a
40-44	1.075	0.683	1.839
45-49	1.665	0.780	1.652
50-54	1.195	1.317	0.842
55-59	1.180	0.837	1.011
All Ages	0.893	0.870	1.174

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	95.579	n/a	n/a
30-34	0.809	n/a	n/a
35-39	0.661	1.268	n/a
40-44	1.109	0.705	1.900
45-49	1.737	0.815	1.730
50-54	1.332	1.465	0.938
55-59	1.349	0.957	1.147
All Ages	1.045	0.951	1.292

Rates of Termination - Female
0 to 9 Years of Service

Exposures

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	566	2,463	1,152	29	7	4	1	1	0	0
25-29	980	4,848	7,081	7,820	6,910	5,451	3,463	1,114	53	14
30-34	486	1,766	2,374	2,951	3,658	4,535	5,748	7,044	6,823	5,292
35-39	338	1,258	1,404	1,515	1,685	1,890	2,126	2,542	3,176	3,810
40-44	317	1,160	1,387	1,424	1,515	1,505	1,485	1,616	1,756	1,995
45-49	208	872	1,117	1,266	1,340	1,512	1,565	1,628	1,749	1,784
50-54	165	537	702	854	1,011	1,201	1,367	1,592	1,762	2,019
55-59	81	290	344	410	465	592	761	942	1,210	1,430
60-64	23	36	26	0	0	0	0	0	0	0
All Ages	3,164	13,230	15,587	16,269	16,591	16,690	16,516	16,479	16,529	16,344

Actual

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	43	127	56	3	0	0	0	0	0	0
25-29	113	351	488	391	269	199	113	26	1	0
30-34	73	168	210	196	229	213	234	248	201	154
35-39	49	125	112	108	70	77	72	69	70	88
40-44	42	111	119	79	53	48	36	37	37	27
45-49	32	87	98	93	48	40	26	35	19	26
50-54	31	70	75	64	38	37	30	34	28	19
55-59	20	51	42	44	15	21	26	14	21	23
60-64	8	8	6	0	0	0	0	0	0	0
All Ages	412	1,097	1,206	978	722	635	536	462	377	336

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Rates of Termination - Female
0 to 9 Years of Service

Expected - Current Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	43.1	172.4	70.2	1.7	0.4	0.2	0.1	0.1	0.0	0.0
25-29	74.6	339.4	431.2	460.6	390.4	302.0	191.9	59.7	2.8	0.6
30-34	37.0	123.6	144.6	173.8	206.7	251.2	318.4	377.6	363.0	215.4
35-39	25.7	88.1	85.5	89.2	95.2	104.7	117.8	136.3	169.0	155.1
40-44	24.1	81.2	84.5	54.1	39.2	33.0	26.7	27.1	25.1	25.5
45-49	15.8	61.0	68.0	48.1	34.7	33.1	28.2	27.4	25.0	22.8
50-54	12.6	37.6	42.8	32.5	26.2	26.3	24.6	26.7	25.2	25.8
55-59	6.2	20.3	20.9	15.6	12.0	13.0	13.7	15.8	17.3	18.3
60-64	1.8	2.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Ages	240.8	926.1	949.2	875.6	804.9	763.5	721.3	670.6	627.4	463.5

Expected - Proposed Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	58.2	182.8	79.6	1.7	0.4	0.2	0.0	0.0	0.0	0.0
25-29	100.8	359.7	489.3	448.9	350.3	263.8	158.6	47.7	2.1	0.5
30-34	50.0	131.0	164.0	169.4	185.5	219.5	263.3	301.5	273.6	180.5
35-39	34.8	93.3	97.0	87.0	85.4	91.5	97.4	108.8	127.4	129.9
40-44	32.6	86.1	95.8	75.0	46.4	41.2	30.7	28.8	25.1	26.5
45-49	21.4	64.7	77.2	66.7	41.0	41.4	32.4	29.0	25.0	23.7
50-54	17.0	39.8	48.5	45.0	30.9	32.9	28.3	28.3	25.2	26.9
55-59	8.3	21.5	23.8	21.6	14.2	16.2	15.8	16.8	17.3	19.0
60-64	2.4	2.7	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All Ages	325.6	981.7	1,077.1	915.3	754.1	706.8	626.5	560.9	495.7	407.0

Rates of Termination - Female
0 to 9 Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	0.997	0.735	0.794	1.599	n/a	n/a	n/a	n/a	n/a	n/a
25-29	1.520	1.035	1.132	0.849	0.689	0.660	0.589	0.428	0.518	n/a
30-34	1.974	1.363	1.451	1.127	1.108	0.850	0.734	0.657	0.555	0.715
35-39	1.917	1.416	1.313	1.205	0.737	0.738	0.610	0.503	0.415	0.567
40-44	1.735	1.361	1.409	1.464	1.343	1.444	1.354	1.347	1.457	1.057
45-49	2.031	1.425	1.435	1.935	1.380	1.207	0.909	1.280	0.751	1.119
50-54	2.497	1.850	1.759	1.983	1.459	1.389	1.227	1.271	1.096	0.731
55-59	3.239	2.518	1.988	2.819	1.271	1.581	1.884	0.899	1.192	1.250
60-64	4.330	3.037	4.033	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	1.709	1.185	1.270	1.117	0.898	0.831	0.744	0.689	0.600	0.725

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service									
Age	0	1	2	3	4	5	6	7	8	9
<=24	0.737	0.694	0.700	1.641	n/a	n/a	n/a	n/a	n/a	n/a
25-29	1.124	0.976	0.998	0.871	0.768	0.756	0.712	0.536	0.688	n/a
30-34	1.460	1.286	1.279	1.156	1.235	0.973	0.888	0.823	0.736	0.854
35-39	1.418	1.336	1.157	1.237	0.822	0.845	0.738	0.630	0.551	0.676
40-44	1.283	1.284	1.242	1.055	1.137	1.154	1.178	1.272	1.457	1.018
45-49	1.502	1.345	1.265	1.395	1.168	0.965	0.791	1.208	0.751	1.076
50-54	1.846	1.745	1.550	1.430	1.235	1.110	1.067	1.200	1.096	0.703
55-59	2.395	2.376	1.753	2.033	1.076	1.264	1.638	0.849	1.192	1.203
60-64	3.202	2.866	3.554	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	1.264	1.118	1.120	1.068	0.958	0.898	0.856	0.824	0.760	0.826

Termination - Female
10 or more Years of Service

Exposures

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	13	0	0
30-34	5,182	6	0
35-39	17,809	1,949	2
40-44	10,033	9,743	1,544
45-49	6,643	5,036	8,171
50-54	8,511	5,803	6,440
55-59	7,244	7,302	8,312
60-64	1	0	1
All Ages	55,436	29,839	24,470

Actual

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	0	0	0
30-34	152	0	0
35-39	323	20	0
40-44	122	63	6
45-49	70	36	20
50-54	88	37	25
55-59	128	79	55
60-64			
All Ages	882	235	105

Rates of Termination - Female - Return of Contributions
10 or more Years of Service

Exposures

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	13	0	0
30-34	5,182	6	0
35-39	17,809	1,949	2
40-44	10,033	9,743	1,544
45-49	6,643	5,036	8,171
50-54	8,511	5,803	6,440
55-59	7,244	7,302	8,312
60-64	1	0	1
All Ages	55,436	29,839	24,470

Actual

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	0	0	0
30-34	29	0	0
35-39	66	4	0
40-44	35	17	1
45-49	17	9	4
50-54	16	9	6
55-59	19	10	6
60-64	0	0	0
All Ages	182	49	17

Rates of Termination - Female - With Benefit
10 or more Years of Service

Exposures

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	13	0	0
30-34	5,182	6	0
35-39	17,809	1,949	2
40-44	10,033	9,743	1,544
45-49	6,643	5,036	8,171
50-54	8,511	5,803	6,440
55-59	7,244	7,302	8,312
60-64	1	0	1
All Ages	55,436	29,839	24,470

Actual

	Years of Service		
Age	10-14	15-19	20-24
<=24	0	0	0
25-29	0	0	0
30-34	122	0	0
35-39	257	17	0
40-44	87	46	5
45-49	53	27	16
50-54	72	28	19
55-59	109	70	48
60-64	0	0	0
All Ages	700	187	88

Termination - Female - With Benefit
10 or more Years of Service

Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.6	0.0	0.0
30-34	218.4	0.2	0.0
35-39	493.8	35.3	0.0
40-44	122.2	90.5	7.3
45-49	47.4	29.5	31.6
50-54	81.5	46.1	33.4
55-59	120.2	100.1	76.7
60-64	0.0	0.0	0.0
All Ages	1,084.0	301.8	149.1

Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.5	0.0	0.0
30-34	174.7	0.2	0.0
35-39	395.2	28.2	0.0
40-44	122.2	77.0	6.2
45-49	47.3	25.0	26.8
50-54	81.5	39.1	28.4
55-59	120.1	85.0	65.4
60-64	0.0	0.0	0.0
All Ages	941.6	254.5	126.8

Rates of Termination - Female - Return of Contributions
10 or more Years of Service

Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.1	0.0	0.0
30-34	21.4	0.0	0.0
35-39	48.5	3.6	0.0
40-44	12.7	9.4	0.7
45-49	4.2	2.6	2.8
50-54	6.8	3.8	2.8
55-59	5.5	4.5	3.3
60-64	0.0	0.0	0.0
All Ages	99.2	23.9	9.7

Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.1	0.0	0.0
30-34	34.8	0.0	0.0
35-39	78.9	5.7	0.0
40-44	24.3	15.1	1.3
45-49	9.4	5.1	5.4
50-54	16.2	7.8	5.7
55-59	12.0	8.3	6.5
60-64	0.0	0.0	0.0
All Ages	175.8	42.0	18.8

Rates of Termination - Female - With Benefit
10 or more Years of Service

Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.6	0.0	0.0
30-34	197.0	0.2	0.0
35-39	445.3	31.7	0.0
40-44	109.4	81.2	6.6
45-49	43.2	26.8	28.8
50-54	74.7	42.3	30.6
55-59	114.6	95.6	73.4
60-64	0.0	0.0	0.0
All Ages	984.8	277.9	139.4

Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	0.0	0.0	0.0
25-29	0.4	0.0	0.0
30-34	139.9	0.1	0.0
35-39	316.4	22.6	0.0
40-44	97.9	61.9	4.9
45-49	37.9	20.0	21.5
50-54	65.3	31.3	22.7
55-59	108.1	76.7	58.9
60-64	0.0	0.0	0.0
All Ages	765.9	212.5	108.0

Termination - Female - With Benefit
10 or more Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	n/a	n/a	n/a
30-34	0.694	n/a	n/a
35-39	0.655	0.574	n/a
40-44	0.996	0.692	0.800
45-49	1.470	1.230	0.618
50-54	1.083	0.803	0.735
55-59	1.064	0.792	0.716
60-64	n/a	n/a	n/a
All Ages	0.814	0.780	0.704

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	n/a	n/a	n/a
30-34	0.867	n/a	n/a
35-39	0.818	0.718	n/a
40-44	0.995	0.814	0.948
45-49	1.471	1.447	0.728
50-54	1.084	0.947	0.864
55-59	1.065	0.933	0.841
60-64	n/a	n/a	n/a
All Ages	0.937	0.925	0.827

Rates of Termination - Female - Return of Contributions
10 or more Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	n/a	n/a	n/a
30-34	1.375	n/a	n/a
35-39	1.362	1.041	n/a
40-44	2.734	1.801	1.244
45-49	4.029	3.577	1.278
50-54	2.401	2.371	2.027
55-59	3.374	2.139	1.942
60-64	n/a	n/a	n/a
All Ages	1.837	2.035	1.720

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	n/a	n/a	n/a
30-34	0.843	n/a	n/a
35-39	0.837	0.660	n/a
40-44	1.430	1.120	0.695
45-49	1.810	1.853	0.677
50-54	1.008	1.154	0.990
55-59	1.552	1.154	0.998
60-64	n/a	n/a	n/a
All Ages	1.037	1.159	0.884

Rates of Termination - Female - With Benefit
10 or more Years of Service

Ratio of Actual to Expected - Current Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	n/a	n/a	n/a
30-34	0.620	n/a	n/a
35-39	0.578	0.521	n/a
40-44	0.794	0.563	0.753
45-49	1.218	1.001	0.553
50-54	0.964	0.661	0.618
55-59	0.953	0.729	0.661
60-64	n/a	n/a	n/a
All Ages	0.711	0.672	0.633

Ratio of Actual to Expected - Proposed Assumptions

	Years of Service		
Age	10-14	15-19	20-24
<=24	n/a	n/a	n/a
25-29	n/a	n/a	n/a
30-34	0.873	n/a	n/a
35-39	0.813	0.732	n/a
40-44	0.887	0.739	1.013
45-49	1.387	1.344	0.741
50-54	1.102	0.895	0.832
55-59	1.011	0.909	0.823
60-64	n/a	n/a	n/a
All Ages	0.914	0.879	0.817

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Retirement with Reduced Benefit, 25 or more Years of Service
Unisex

			Expected Retirements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=49	2,314	39	35.6	35.6	1.094	1.094
50+	9,771	255	278.2	278.2	0.915	0.915
All Ages	12,085	293	313.8	313.8	0.935	0.935

Retirement with Unreduced Benefit
Male - Age 60 and Less Than 25 Years of Service

			Expected Retirements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=59	0	0	0.0	0.0	n/a	n/a
60	1,153	76	92.2	115.3	0.821	0.657
61	1,004	68	80.3	100.4	0.843	0.674
62	884	69	75.1	97.2	0.912	0.704
63-64	1,336	115	126.9	147.0	0.907	0.784
65	422	59	61.2	71.7	0.957	0.817
66-70	799	161	143.8	135.8	1.122	1.188
71+	194	34	34.6	38.4	0.997	0.897
All Ages	5,792	582	614.2	705.9	0.947	0.824

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Retirement with Unreduced Benefit
Male - First Year Attainment of Age 55 and 25 Years of Service

			Expected Retirements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=54	0	0	0.0	0.0	n/a	n/a
55	1,222	174	183.3	183.3	0.949	0.949
56-57	149	30	32.8	32.8	0.915	0.915
58-59	128	41	33.3	32.0	1.232	1.281
60	55	21	17.6	14.9	1.193	1.414
61	57	24	20.0	17.1	1.203	1.404
62	47	23	21.2	18.8	1.087	1.223
63-64	71	36	32.0	28.4	1.127	1.268
65	26	15	13.0	13.0	1.154	1.154
66-70	49	25	24.5	24.5	1.020	1.020
71+	11	5	5.5	5.5	0.909	0.909
All Ages	1,815	394	383.0	370.2	1.029	1.064

Retirement with Unreduced Benefit
Male - After First Year Attainment of Age 55 and 25 Years of Service

			Expected Retirements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=54	0	0	0.0	0.0	n/a	n/a
55	0	0	0.0	0.0	n/a	n/a
56-57	2,513	316	314.6	314.6	1.004	1.004
58-59	2,898	450	435.3	420.5	1.035	1.071
60	1,485	322	311.9	311.8	1.034	1.034
61	1,356	351	325.4	311.9	1.080	1.127
62	1,191	446	428.8	428.8	1.041	1.041
63-64	1,396	509	418.8	418.8	1.216	1.216
65	356	124	124.6	135.3	0.995	0.917
66-70	681	235	204.3	204.3	1.153	1.153
71+	213	61	62.1	62.1	0.982	0.982
All Ages	12,089	2,816	2,625.8	2,608.1	1.073	1.080

Retirement with Unreduced Benefit
Female - Age 60 and Less Than 25 Years of Service

			Expected Retirements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=59	0	0	0.0	0.0	n/a	n/a
60	4,841	184	266.3	338.9	0.692	0.544
61	3,758	158	206.7	263.1	0.764	0.601
62	3,137	190	235.3	313.7	0.809	0.606
63-64	4,104	280	328.3	410.4	0.853	0.682
65	1,147	118	137.6	172.1	0.855	0.684
66-70	2,116	290	296.2	317.4	0.979	0.914
71+	385	62	60.6	75.8	1.020	0.816
All Ages	19,488	1,282	1,531.1	1,891.3	0.837	0.678

Retirement with Unreduced Benefit
Female - First Year Attainment of Age 55 and 25 Years of Service

			Expected Retirements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=54	0	0	0.0	0.0	n/a	n/a
55	3,561	662	569.8	569.8	1.161	1.161
56-57	629	105	113.2	119.5	0.927	0.879
58-59	747	192	194.2	186.8	0.987	1.027
60	433	163	138.6	129.9	1.176	1.255
61	403	164	141.1	129.0	1.163	1.272
62	369	215	184.5	169.7	1.165	1.267
63-64	564	308	270.7	248.2	1.138	1.241
65	174	101	87.0	87.0	1.161	1.161
66-70	352	219	176.0	176.0	1.244	1.244
71+	58	34	29.0	29.0	1.172	1.172
All Ages	7,290	2,162	1,904.0	1,844.8	1.136	1.172

Retirement with Unreduced Benefit
Female - After First Year Attainment of Age 55 and 25 Years of Service

			Expected Retirements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=54	0	0	0.0	0.0	n/a	n/a
55	0	0	0.0	0.0	n/a	n/a
56-57	6,626	936	895.9	895.9	1.044	1.044
58-59	7,368	1,260	1,179.8	1,068.8	1.068	1.179
60	3,400	772	714.0	680.0	1.082	1.136
61	2,981	768	685.6	655.8	1.120	1.171
62	2,706	956	865.9	865.9	1.105	1.105
63-64	3,295	1,117	955.6	873.2	1.169	1.279
65	941	336	329.4	329.3	1.022	1.022
66-70	2,045	747	613.5	613.5	1.217	1.217
71+	518	156	149.7	149.7	1.040	1.040
All Ages	29,880	7,049	6,389.3	6,132.2	1.103	1.150

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Ordinary Mortality - Male

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=24	961	0	0.3	0.3	0.591	0.591
25-29	9,754	3	3.4	3.4	0.975	0.975
30-34	15,603	3	5.8	5.8	0.548	0.548
35-39	14,678	5	6.1	6.1	0.809	0.809
40-44	12,935	7	8.2	8.2	0.828	0.828
45-49	10,154	6	9.1	9.1	0.625	0.625
50-54	10,622	14	14.0	14.0	0.970	0.970
55-59	13,217	17	25.3	25.3	0.654	0.654
60-64	10,026	17	27.4	27.4	0.632	0.632
65-69	2,200	7	9.3	9.3	0.765	0.765
70+	551	4	3.9	3.9	1.022	1.022
All Ages	100,701	83	112.6	112.6	0.733	0.733

Ordinary Mortality - Female

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=24	4,223	1	0.6	0.6	1.169	1.169
25-29	37,747	12	6.1	6.1	1.895	1.895
30-34	45,865	20	8.2	8.2	2.455	2.455
35-39	39,504	12	7.8	7.8	1.510	1.510
40-44	35,480	8	10.9	10.9	0.716	0.716
45-49	34,704	14	15.5	15.5	0.918	0.918
50-54	42,155	28	28.8	28.8	0.974	0.974
55-59	48,200	40	56.1	56.1	0.708	0.708
60-64	29,655	28	51.1	51.1	0.539	0.539
65-69	6,425	14	16.5	16.5	0.860	0.860
70+	1,311	2	5.8	5.8	0.353	0.353
All Ages	325,269	178	207.3	207.3	0.857	0.857

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Ordinary Disability - Male

			Expected Disablements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=24	0	0	0.0	0.0	n/a	n/a
25-29	1	0	0.0	0.0	18.380	18.380
30-34	1,894	0	1.1	1.1	0.112	0.112
35-39	7,894	3	5.1	5.1	0.678	0.678
40-44	8,869	6	6.9	6.9	0.805	0.805
45-49	7,167	8	8.6	8.6	0.992	0.992
50-54	8,106	15	22.9	16.3	0.674	0.945
55-59	4,091	24	24.3	19.9	1.000	1.224
60-64	2,777	30	25.2	18.8	1.197	1.606
65-69	726	8	8.6	8.2	0.932	0.979
70+	204	5	2.5	2.5	1.990	1.990
All Ages	41,729	101	105.2	87.3	0.956	1.151

Ordinary Disability - Female

			Expected Disablements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=24	0	0	0.0	0.0	n/a	n/a
25-29	13	0	0.0	0.0	0.000	0.000
30-34	5,190	5	3.4	3.4	1.345	1.345
35-39	19,762	12	14.6	14.6	0.849	0.849
40-44	21,323	17	22.0	22.0	0.758	0.758
45-49	21,654	28	32.8	32.8	0.859	0.859
50-54	30,779	56	69.1	69.1	0.816	0.816
55-59	22,895	82	106.1	106.1	0.777	0.777
60-64	13,007	82	102.8	102.8	0.800	0.800
65-69	2,576	31	33.8	33.8	0.921	0.921
70+	452	8	9.2	9.2	0.869	0.869
All Ages	137,651	322	393.7	393.7	0.818	0.818

Teachers' Pension and Annuity Fund of New Jersey

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Accidental Disability - Male

			Expected Disablements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=24	961	0	0.1	0.1	0.264	0.264
25-29	9,747	0	0.6	0.6	0.206	0.206
30-34	13,800	0	0.8	0.8	0.128	0.128
35-39	13,307	0	0.8	0.8	0.100	0.100
40-44	12,219	0	0.7	0.7	0.097	0.097
45-49	9,711	0	0.6	0.6	0.105	0.105
50-54	10,179	1	0.6	0.6	1.718	1.718
55-59	6,009	2	0.4	0.4	5.670	5.670
60-64	4,096	1	0.2	0.2	4.175	4.175
65-69	0	0	0.0	0.0	n/a	n/a
70+	0	0	0.0	0.0	n/a	n/a
All Ages	80,029	5	4.8	4.8	0.952	0.952

Accidental Disability - Female

			Expected Disablements		Ratio of Actual/Expected	
	Exposures	Actual	Proposed Assumptions	Current Assumptions	Proposed Assumptions	Current Assumptions
<=24	4,223	0	0.3	0.3	0.251	0.251
25-29	37,733	1	2.3	2.3	0.273	0.273
30-34	40,573	1	2.4	2.4	0.280	0.280
35-39	35,694	0	2.1	2.1	0.193	0.193
40-44	33,485	1	2.0	2.0	0.623	0.623
45-49	32,911	2	2.0	2.0	1.113	1.113
50-54	39,970	3	2.4	2.4	1.328	1.328
55-59	27,995	6	1.7	1.7	3.660	3.660
60-64	14,966	2	0.9	0.9	2.275	2.275
65-69	0	0	0.0	0.0	n/a	n/a
70+	0	0	0.0	0.0	n/a	n/a
All Ages	267,550	17	16.1	16.1	1.034	1.034

Healthy Retiree and Beneficiary Mortality - Male
Counts

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Recommended Assumptions	Current Assumptions	Recommended Assumptions	Current Assumptions
50-54	304	5	1.2	1.2	4.024	4.024
55-59	3,460	31	14.7	14.7	2.107	2.107
60-64	17,268	131	113.6	113.6	1.153	1.153
65-69	19,815	202	216.7	216.7	0.932	0.932
70-74	12,905	223	231.9	231.9	0.962	0.962
75-79	10,916	344	359.0	359.0	0.958	0.958
80-84	7,895	470	470.3	470.3	0.999	0.999
85-89	3,828	406	399.6	399.6	1.016	1.016
90+	1,565	364	296.1	296.1	1.229	1.229
All Ages	77,956	2,176	2,103.2	2,103.2	1.035	1.035

Healthy Retiree and Beneficiary Mortality - Male
Benefits

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Recommended Assumptions	Current Assumptions	Recommended Assumptions	Current Assumptions
50-54	9,678,897	113,309	39,401	39,401	2.876	2.876
55-59	155,439,679	1,327,996	662,483	662,483	2.005	2.005
60-64	815,439,138	5,636,503	5,374,298	5,374,298	1.049	1.049
65-69	913,294,915	8,837,356	9,972,992	9,972,992	0.886	0.886
70-74	569,357,077	9,175,380	10,198,154	10,198,154	0.900	0.900
75-79	450,437,411	13,243,516	14,738,389	14,738,389	0.899	0.899
80-84	286,690,643	16,219,153	16,919,179	16,919,179	0.959	0.959
85-89	114,395,309	11,594,360	11,818,910	11,818,910	0.981	0.981
90+	37,401,751	8,749,673	7,049,476	7,049,476	1.241	1.241
All Ages	3,352,134,821	74,897,247	76,773,282	76,773,282	0.976	0.976

Healthy Retiree and Beneficiary Mortality - Female
Counts

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Recommended Assumptions	Current Assumptions	Recommended Assumptions	Current Assumptions
50-54	704	4	1.6	1.6	2.449	2.449
55-59	8,908	33	34.8	34.8	0.949	0.949
60-64	35,304	153	209.2	209.2	0.731	0.731
65-69	36,291	226	284.2	284.2	0.795	0.795
70-74	23,901	288	289.0	289.0	0.997	0.997
75-79	18,543	399	382.8	382.8	1.042	1.042
80-84	15,584	619	553.4	553.4	1.119	1.119
85-89	9,717	762	738.7	738.7	1.032	1.032
90+	7,091	1,222	1,066.9	1,066.9	1.145	1.145
All Ages	156,043	3,706	3,560.5	3,560.5	1.041	1.041

Healthy Retiree and Beneficiary Mortality - Female
Benefits

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Recommended Assumptions	Current Assumptions	Recommended Assumptions	Current Assumptions
50-54	22,185,787	95,731	51,902	51,902	1.844	1.844
55-59	382,449,001	1,443,927	1,498,692	1,498,692	0.963	0.963
60-64	1,455,111,971	6,265,541	8,609,704	8,609,704	0.728	0.728
65-69	1,402,959,175	8,868,607	10,961,634	10,961,634	0.809	0.809
70-74	854,272,612	9,875,093	10,298,016	10,298,016	0.959	0.959
75-79	601,585,673	12,883,827	12,341,697	12,341,697	1.044	1.044
80-84	427,646,784	16,334,459	15,030,517	15,030,517	1.087	1.087
85-89	210,861,816	16,431,205	15,899,536	15,899,536	1.033	1.033
90+	128,090,493	21,578,522	19,179,269	19,179,269	1.125	1.125
All Ages	5,485,163,313	93,776,912	93,870,966	93,870,966	0.999	0.999

Disabled Retiree Mortality - Male

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Recommended Assumptions	Current Assumptions	Recommended Assumptions	Current Assumptions
50-54	127	1	3.1	3.3	0.325	0.304
55-59	249	5	7.2	7.7	0.696	0.652
60-64	502	11	17.1	18.2	0.644	0.604
65-69	408	13	16.5	17.6	0.789	0.740
70-74	256	10	13.4	14.3	0.746	0.699
75-79	146	10	10.0	10.6	1.003	0.940
80-84	86	5	7.8	8.3	0.641	0.601
85-89	43	9	4.9	5.2	1.839	1.724
90+	9	2	1.4	1.5	1.404	1.316
All Ages	1,826	66	81.3	86.7	0.812	0.761

Disabled Retiree Mortality - Female

			Expected Deaths		Ratio of Actual/Expected	
	Exposures	Actual	Recommended Assumptions	Current Assumptions	Recommended Assumptions	Current Assumptions
50-54	452	5	5.6	5.9	0.891	0.844
55-59	942	17	16.0	16.9	1.059	1.003
60-64	1,452	27	31.7	33.5	0.851	0.806
65-69	1,413	26	39.8	42.0	0.654	0.620
70-74	853	34	32.7	34.5	1.041	0.986
75-79	521	26	27.6	29.2	0.941	0.891
80-84	280	19	20.6	21.7	0.923	0.874
85-89	132	10	13.0	13.8	0.767	0.727
90+	44	8	7.0	7.3	1.149	1.089
All Ages	6,089	172	194.0	204.8	0.886	0.840

Appendix B – Proposed Assumptions

The proposed demographic assumptions are summarized on the following pages.

Teachers' Pension and Annuity Fund of New Jersey

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Proposed Assumptions
Rates of Termination - Male

Less than 10 Years of Service			10 to 14 Years of Service Proposed Rates		15 to 19 Years of Service Proposed Rates		20 to 24 Years of Service Proposed Rates	
Years of Service	Proposed Rate	Age	With Benefit	Contribution Refund	With Benefit	Contribution Refund	With Benefit	Contribution Refund
0	0.0965	25	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
1	0.0805	26	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
2	0.0736	27	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
3	0.0487	28	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
4	0.0339	29	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
5	0.0268							
6	0.0205	30	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
7	0.0181	31	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
8	0.0146	32	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
9	0.0125	33	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
		34	0.0065	0.0044	0.0047	0.0031	0.0031	0.0021
		35	0.0066	0.0043	0.0048	0.0030	0.0032	0.0020
		36	0.0068	0.0041	0.0048	0.0030	0.0032	0.0020
		37	0.0070	0.0041	0.0050	0.0030	0.0033	0.0020
		38	0.0065	0.0037	0.0047	0.0026	0.0031	0.0018
		39	0.0060	0.0033	0.0044	0.0023	0.0029	0.0016
		40	0.0069	0.0036	0.0050	0.0026	0.0033	0.0017
		41	0.0063	0.0031	0.0045	0.0022	0.0030	0.0015
		42	0.0057	0.0027	0.0041	0.0019	0.0027	0.0013
		43	0.0057	0.0025	0.0041	0.0018	0.0028	0.0012
		44	0.0057	0.0024	0.0041	0.0018	0.0027	0.0012
		45	0.0057	0.0023	0.0041	0.0017	0.0027	0.0011
		46	0.0057	0.0022	0.0041	0.0016	0.0027	0.0011
		47	0.0055	0.0020	0.0039	0.0015	0.0026	0.0010
		48	0.0058	0.0021	0.0042	0.0015	0.0028	0.0010
		49	0.0061	0.0021	0.0044	0.0015	0.0030	0.0010
		50	0.0065	0.0021	0.0047	0.0015	0.0031	0.0010
		51	0.0069	0.0021	0.0050	0.0015	0.0033	0.0010
		52	0.0073	0.0021	0.0053	0.0015	0.0035	0.0010
		53	0.0088	0.0023	0.0063	0.0017	0.0042	0.0011
		54	0.0103	0.0026	0.0074	0.0019	0.0050	0.0012
		55	0.0118	0.0028	0.0085	0.0020	0.0057	0.0013
		56	0.0134	0.0030	0.0097	0.0021	0.0065	0.0014
		57	0.0154	0.0031	0.0110	0.0023	0.0074	0.0015
		58	0.0155	0.0030	0.0112	0.0021	0.0075	0.0014
		59	0.0157	0.0028	0.0113	0.0020	0.0076	0.0013

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Termination - Female

Years of Service	Less than 10 Years of Service Proposed Rates: Less than Age 40	Less than 10 Years of Service Proposed Rates: At Least Age 40	Age	10 to 14 Years of Service Proposed Rates: With Benefit	10 to 14 Years of Service Proposed Rates: Contribution Refund	15 to 19 Years of Service Proposed Rates: With Benefit	15 to 19 Years of Service Proposed Rates: Contribution Refund	20 to 24 Years of Service Proposed Rates: With Benefit	20 to 24 Years of Service Proposed Rates: Contribution Refund
0	0.1029	0.1029	25	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
1	0.0742	0.0742	26	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
2	0.0691	0.0691	27	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
3	0.0574	0.0527	28	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
4	0.0507	0.0306	29	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
5	0.0484	0.0274							
6	0.0458	0.0207	30	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
7	0.0428	0.0178	31	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
8	0.0401	0.0143	32	0.0306	0.0076	0.0250	0.0062	0.0166	0.0042
9	0.0341	0.0133	33	0.0279	0.0070	0.0229	0.0057	0.0153	0.0038
			34	0.0254	0.0063	0.0207	0.0052	0.0138	0.0035
			35	0.0227	0.0057	0.0186	0.0047	0.0124	0.0031
			36	0.0202	0.0050	0.0165	0.0041	0.0110	0.0027
			37	0.0177	0.0044	0.0145	0.0036	0.0096	0.0024
			38	0.0154	0.0038	0.0126	0.0031	0.0084	0.0021
			39	0.0130	0.0033	0.0106	0.0027	0.0071	0.0018
			40	0.0134	0.0033	0.0093	0.0023	0.0062	0.0016
			41	0.0105	0.0026	0.0073	0.0018	0.0049	0.0012
			42	0.0077	0.0019	0.0054	0.0013	0.0035	0.0009
			43	0.0071	0.0018	0.0050	0.0012	0.0033	0.0008
			44	0.0066	0.0017	0.0046	0.0011	0.0030	0.0008
			45	0.0061	0.0015	0.0042	0.0011	0.0028	0.0007
			46	0.0055	0.0014	0.0038	0.0010	0.0026	0.0006
			47	0.0054	0.0013	0.0038	0.0009	0.0025	0.0006
			48	0.0056	0.0014	0.0039	0.0010	0.0026	0.0007
			49	0.0059	0.0015	0.0041	0.0010	0.0027	0.0007
			50	0.0062	0.0015	0.0043	0.0011	0.0029	0.0007
			51	0.0064	0.0016	0.0045	0.0011	0.0030	0.0007
			52	0.0070	0.0017	0.0048	0.0012	0.0032	0.0008
			53	0.0085	0.0021	0.0058	0.0015	0.0039	0.0010
			54	0.0099	0.0025	0.0069	0.0017	0.0046	0.0012
			55	0.0129	0.0014	0.0089	0.0010	0.0059	0.0007
			56	0.0146	0.0016	0.0101	0.0011	0.0067	0.0008
			57	0.0160	0.0018	0.0112	0.0012	0.0075	0.0008
			58	0.0160	0.0018	0.0112	0.0012	0.0075	0.0008
			59	0.0160	0.0018	0.0112	0.0012	0.0075	0.0008

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Male - Class A and B

Age	Less than 25 Years of Service	More than 25 Years of Service: First Eligibility	More than 25 Years of Service: After First Eligibility
Less than 48	0.0120	N/A	N/A
48	0.0145	N/A	N/A
49	0.0165	N/A	N/A
50	0.0195	N/A	N/A
51	0.0235	N/A	N/A
52	0.0275	N/A	N/A
53	0.0375	N/A	N/A
54	0.0475	N/A	N/A
55	N/A	0.1500	N/A
56	N/A	0.2200	0.1200
57	N/A	0.2200	0.1300
58	N/A	0.2600	0.1400
59	N/A	0.2600	0.1600
60	0.0800	0.3200	0.2100
61	0.0800	0.3500	0.2400
62	0.0850	0.4500	0.3600
63	0.0950	0.4500	0.3000
64	0.0950	0.4500	0.3000
65	0.1450	0.5000	0.3500
66	0.1800	0.5000	0.3000
67	0.1800	0.5000	0.3000
68	0.1800	0.5000	0.3000
69	0.1800	0.5000	0.3000
70	0.1800	0.5000	0.3000
71 and older	0.1800	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Female - Class A and B

Age	Less than 25 Years of Service	More than 25 Years of Service: First Eligibility	More than 25 Years of Service: After First Eligibility
Less than 48	0.0120	N/A	N/A
48	0.0145	N/A	N/A
49	0.0165	N/A	N/A
50	0.0195	N/A	N/A
51	0.0235	N/A	N/A
52	0.0275	N/A	N/A
53	0.0375	N/A	N/A
54	0.0475	N/A	N/A
55	N/A	0.1600	N/A
56	N/A	0.1800	0.1300
57	N/A	0.1800	0.1400
58	N/A	0.2600	0.1500
59	N/A	0.2600	0.1700
60	0.0550	0.3200	0.2100
61	0.0550	0.3500	0.2300
62	0.0750	0.5000	0.3200
63	0.0800	0.4800	0.2900
64	0.0800	0.4800	0.2900
65	0.1200	0.5000	0.3500
66	0.1400	0.5000	0.3000
67	0.1400	0.5000	0.3000
68	0.1400	0.5000	0.3000
69	0.1400	0.5000	0.3000
70	0.1400	0.5000	0.3000
71 and older	0.1600	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Male - Class D

Age	Less than 25 Years of Service	More than 25 Years of Service First Eligibility	More than 25 Years of Service After First Eligibility
Less than 48	0.0060	N/A	N/A
48	0.0075	N/A	N/A
49	0.0085	N/A	N/A
50	0.0100	N/A	N/A
51	0.0120	N/A	N/A
52	0.0140	N/A	N/A
53	0.0190	N/A	N/A
54	0.0240	N/A	N/A
55	0.1150	N/A	N/A
56	0.1200	N/A	N/A
57	0.1250	N/A	N/A
58	0.1350	N/A	N/A
59	0.1400	N/A	N/A
60	0.0800	0.3400	N/A
61	0.0800	0.3500	0.2400
62	0.0850	0.4500	0.3600
63	0.0950	0.4500	0.3000
64	0.0950	0.4500	0.3000
65	0.1450	0.5000	0.3500
66	0.1800	0.5000	0.3000
67	0.1800	0.5000	0.3000
68	0.1800	0.5000	0.3000
69	0.1800	0.5000	0.3000
70	0.1800	0.5000	0.3000
71 and older	0.1800	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Female - Class D

Age	Less than 25 Years of Service	More than 25 Years of Service: First Eligibility	More than 25 Years of Service: After First Eligibility
Less than 48	0.0060	N/A	N/A
48	0.0075	N/A	N/A
49	0.0085	N/A	N/A
50	0.0100	N/A	N/A
51	0.0120	N/A	N/A
52	0.0140	N/A	N/A
53	0.0190	N/A	N/A
54	0.0240	N/A	N/A
55	0.1150	N/A	N/A
56	0.1200	N/A	N/A
57	0.1250	N/A	N/A
58	0.1350	N/A	N/A
59	0.1400	N/A	N/A
60	0.0550	0.3200	N/A
61	0.0550	0.3500	0.2300
62	0.0750	0.5000	0.3200
63	0.0800	0.4800	0.2900
64	0.0800	0.4800	0.2900
65	0.1200	0.5000	0.3500
66	0.1400	0.5000	0.3000
67	0.1400	0.5000	0.3000
68	0.1400	0.5000	0.3000
69	0.1400	0.5000	0.3000
70	0.1400	0.5000	0.3000
71 and older	0.1600	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Male - Class E and F

Age	Less than 25 Years of Service	More than 25 Years of Service First Eligibility	More than 25 Years of Service After First Eligibility
Less than 48	0.0055	N/A	N/A
48	0.0070	N/A	N/A
49	0.0075	N/A	N/A
50	0.0090	N/A	N/A
51	0.0110	N/A	N/A
52	0.0125	N/A	N/A
53	0.0170	N/A	N/A
54	0.0215	N/A	N/A
55	0.1050	N/A	N/A
56	0.1075	N/A	N/A
57	0.1100	N/A	N/A
58	0.1200	N/A	N/A
59	0.1250	N/A	N/A
60	0.2000	N/A	N/A
61	0.2200	N/A	N/A
62	0.2300	0.5000	N/A
63	0.0950	0.4500	0.3000
64	0.0950	0.4500	0.3000
65	0.1450	0.5000	0.3500
66	0.1800	0.5000	0.3000
67	0.1800	0.5000	0.3000
68	0.1800	0.5000	0.3000
69	0.1800	0.5000	0.3000
	0.1800		
70	0.1800	0.5000	0.3000
71 and older	0.1700	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Female - Class E and F

Age	Less than 25 Years of Service	More than 25 Years of Service: First Eligibility	More than 25 Years of Service: After First Eligibility
Less than 48	0.0055	N/A	N/A
48	0.0070	N/A	N/A
49	0.0075	N/A	N/A
50	0.0090	N/A	N/A
51	0.0110	N/A	N/A
52	0.0125	N/A	N/A
53	0.0170	N/A	N/A
54	0.0215	N/A	N/A
55	0.1050	N/A	N/A
56	0.1075	N/A	N/A
57	0.1100	N/A	N/A
58	0.1200	N/A	N/A
59	0.1250	N/A	N/A
60	0.2000	N/A	N/A
61	0.2200	N/A	N/A
62	0.1800	0.5000	N/A
63	0.0800	0.4800	0.2900
64	0.0800	0.4800	0.2900
65	0.1200	0.5000	0.3500
66	0.1400	0.5000	0.3000
67	0.1400	0.5000	0.3000
68	0.1400	0.5000	0.3000
69	0.1400	0.5000	0.3000
70	0.1400	0.5000	0.3000
71 and older	0.1600	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Male - Class G

Age	Less than 30 Years of Service	More than 30 Years of Service First Eligibility	More than 30 Years of Service After First Eligibility
Less than 48	0.0030	N/A	N/A
48	0.0035	N/A	N/A
49	0.0040	N/A	N/A
50	0.0045	N/A	N/A
51	0.0055	N/A	N/A
52	0.0065	N/A	N/A
53	0.0085	N/A	N/A
54	0.0110	N/A	N/A
55	0.0500	N/A	N/A
56	0.0600	N/A	N/A
57	0.0700	N/A	N/A
58	0.0800	N/A	N/A
59	0.0900	N/A	N/A
60	0.1500	N/A	N/A
61	0.1600	N/A	N/A
62	0.3600	N/A	N/A
63	0.2800	N/A	N/A
64	0.2800	N/A	N/A
65	0.3400	0.5000	N/A
66	0.1800	0.5000	0.3000
67	0.1800	0.5000	0.3000
68	0.1800	0.5000	0.3000
69	0.1800	0.5000	0.3000
70	0.1800	0.5000	0.3000
71 and older	0.1800	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Retirement - Female - Class G

Age	Less than 30 Years of Service	More than 30 Years of Service First Eligibility	More than 30 Years of Service After First Eligibility
Less than 48	0.0030	N/A	N/A
48	0.0035	N/A	N/A
49	0.0040	N/A	N/A
50	0.0045	N/A	N/A
51	0.0055	N/A	N/A
52	0.0065	N/A	N/A
53	0.0085	N/A	N/A
54	0.0110	N/A	N/A
55	0.0500	N/A	N/A
56	0.0600	N/A	N/A
57	0.0700	N/A	N/A
58	0.0800	N/A	N/A
59	0.0900	N/A	N/A
60	0.1500	N/A	N/A
61	0.1600	N/A	N/A
62	0.3200	N/A	N/A
63	0.2800	N/A	N/A
64	0.2800	N/A	N/A
65	0.3200	0.5000	N/A
66	0.1400	0.5000	0.3000
67	0.1400	0.5000	0.3000
68	0.1400	0.5000	0.3000
69	0.1400	0.5000	0.3000
70	0.1400	0.5000	0.3000
71 and older	0.1600	0.5000	0.3000

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Disability

	Ordinary Disability*		Accidental Disability	
	Proposed Rates			
Age	Male	Female	Gender	Proposed Rate
25	0.000301	0.000379	Male	0.00006
26	0.000313	0.000408	Female	0.00006
27	0.000326	0.000439		
28	0.000375	0.000476		
29	0.000424	0.000513		
30	0.000473	0.000550		
31	0.000522	0.000587		
32	0.000573	0.000626		
33	0.000585	0.000642		
34	0.000597	0.000658		
35	0.000609	0.000674		
36	0.000621	0.000690		
37	0.000635	0.000704		
38	0.000657	0.000767		
39	0.000679	0.000830		
40	0.000701	0.000893		
41	0.000723	0.000956		
42	0.000744	0.001020		
43	0.000837	0.001119		
44	0.000930	0.001218		
45	0.001023	0.001317		
46	0.001116	0.001416		
47	0.001211	0.001513		
48	0.001281	0.001595		
49	0.001351	0.001677		
50	0.001421	0.001759		
51	0.002074	0.001841		
52	0.002727	0.001925		
53	0.003380	0.002452		
54	0.004033	0.002979		
55	0.004686	0.003506		
56	0.005339	0.004033		
57	0.005992	0.004558		
58	0.006645	0.005254		
59	0.007298	0.005950		

Proposed Assumptions
Rates of Disability

	Ordinary Disability*		Accidental Disability	
	Proposed Rates			
Age	Male	Female	Gender	Proposed Rate
60	0.007951	0.006646	Male	0.00006
61	0.008604	0.007342	Female	0.00006
62	0.009257	0.008039		
63	0.009910	0.009177		
64	0.010563	0.010315		
65	0.011216	0.011453		
66	0.011869	0.012591		
67	0.012522	0.013730		
68	0.012522	0.015590		
69	0.012522	0.017450		
70	0.012522	0.019310		
71	0.012522	0.021170		
72	0.012522	0.023030		
73	0.012522	0.022140		
74	0.012522	0.021250		
75	0.012522	0.020360		
76	0.012522	0.019470		
77	0.012522	0.018580		
78	0.012522	0.017690		
79	0.012522	0.016800		

* Assumption does not apply if have less than 10 years of service or have attained age 55 and 25 years of service (for Class B employees)

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Mortality - Male
Base Year = 2000

	Proposed Rates		
	Active	Postretirement	
Age	Ordinary	Healthy	Disabled
15	0.000212	0.000716	0.016928
16	0.000219	0.000756	0.016928
17	0.000228	0.000801	0.016928
18	0.000240	0.000841	0.016928
19	0.000254	0.000881	0.016928
20	0.000269	0.000919	0.016928
21	0.000284	0.000950	0.016928
22	0.000301	0.000974	0.016928
23	0.000316	0.000993	0.016928
24	0.000331	0.001001	0.016928
25	0.000345	0.001001	0.016928
26	0.000357	0.001006	0.016928
27	0.000366	0.001017	0.016928
28	0.000373	0.001046	0.016928
29	0.000376	0.001097	0.016928
30	0.000376	0.000940	0.016928
31	0.000378	0.001034	0.016928
32	0.000382	0.001148	0.016928
33	0.000393	0.001280	0.016928
34	0.000412	0.001422	0.016928
35	0.000353	0.001572	0.016928
36	0.000388	0.001729	0.016928
37	0.000431	0.001882	0.016928
38	0.000481	0.002040	0.016928
39	0.000534	0.002202	0.016928
40	0.000591	0.002370	0.016928
41	0.000649	0.002551	0.016928
42	0.000707	0.002756	0.016928
43	0.000766	0.002992	0.016928
44	0.000827	0.003262	0.016928

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Mortality - Male
Base Year = 2000

	Proposed Rates		
	Active	Postretirement	
Age	Ordinary	Healthy	Disabled
45	0.000890	0.003573	0.016928
46	0.000958	0.003881	0.017885
47	0.001035	0.004215	0.018843
48	0.001124	0.004556	0.019803
49	0.001225	0.004908	0.020765
50	0.001342	0.005265	0.021731
51	0.001458	0.005244	0.022701
52	0.001583	0.005160	0.023672
53	0.001711	0.005030	0.024644
54	0.001843	0.004892	0.025614
55	0.001978	0.004781	0.026581
56	0.002112	0.004759	0.027549
57	0.002250	0.004820	0.028520
58	0.002398	0.005006	0.029500
59	0.002562	0.005329	0.030501
60	0.002747	0.005813	0.031531
61	0.002979	0.006440	0.032605
62	0.003247	0.007216	0.033736
63	0.003545	0.008124	0.034938
64	0.003884	0.009138	0.036230
65	0.004263	0.010238	0.037630
66	0.004682	0.011409	0.039160
67	0.005143	0.012631	0.040838
68	0.005637	0.013934	0.042682
69	0.006164	0.015339	0.044710
70	0.006725	0.016962	0.046937
71	0.007305	0.018832	0.049381
72	0.007902	0.021006	0.052054
73	0.008525	0.023505	0.054969
74	0.009168	0.026371	0.058134

Proposed Assumptions
Rates of Mortality - Male
Base Year = 2000

	Proposed Rates		
	Active	Postretirement	
Age	Ordinary	Healthy	Disabled
75	0.009823	0.029598	0.061550
76	0.010418	0.033249	0.065213
77	0.011240	0.037273	0.069112
78	0.012337	0.041786	0.073230
79	0.013662	0.046796	0.077544
80	0.015134	0.052282	0.082029
81	N/A	0.058768	0.086658
82	N/A	0.065941	0.091408
83	N/A	0.073899	0.096257
84	N/A	0.082537	0.101192
85	N/A	0.092106	0.106202
86	N/A	0.102766	0.111281
87	N/A	0.114570	0.116426
88	N/A	0.127483	0.121639
89	N/A	0.141763	0.126925
90	N/A	0.156880	0.137556
91	N/A	0.171578	0.149827
92	N/A	0.186610	0.162454
93	N/A	0.201921	0.175246
94	N/A	0.216859	0.188020
95	N/A	0.231626	0.200618
96	N/A	0.249836	0.212929
97	N/A	0.263870	0.224889
98	N/A	0.277460	0.236472
99	N/A	0.290582	0.247655
100	N/A	0.303209	0.258417
101	N/A	0.315593	0.268971
102	N/A	0.327083	0.278764
103	N/A	0.337075	0.287280
104	N/A	0.344963	0.294002
105	N/A	0.350140	0.298414
106	N/A	0.352000	0.300000
107	N/A	0.352000	0.300000
108	N/A	0.352000	0.300000
109	N/A	0.352000	0.300000

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Mortality - Female
Base Year = 2003 for Post and 2000 for Pre-Retirement

	Proposed Rates		
	Active	Postretirement	
Age	Ordinary	Healthy	Disabled
15	0.000188	0.000230	0.006705
16	0.000176	0.000240	0.006705
17	0.000165	0.000248	0.006705
18	0.000147	0.000255	0.006705
19	0.000140	0.000257	0.006705
20	0.000141	0.000258	0.006705
21	0.000143	0.000260	0.006705
22	0.000148	0.000263	0.006705
23	0.000155	0.000266	0.006705
24	0.000162	0.000273	0.006705
25	0.000170	0.000281	0.006705
26	0.000177	0.000290	0.006705
27	0.000184	0.000301	0.006705
28	0.000188	0.000319	0.006705
29	0.000190	0.000336	0.006705
30	0.000191	0.000384	0.006705
31	0.000192	0.000439	0.006705
32	0.000194	0.000492	0.006705
33	0.000197	0.000544	0.006705
34	0.000201	0.000588	0.006705
35	0.000207	0.000631	0.006705
36	0.000214	0.000673	0.006705
37	0.000223	0.000714	0.006705
38	0.000235	0.000760	0.006705
39	0.000248	0.000811	0.006705
40	0.000284	0.000873	0.006705
41	0.000325	0.000946	0.006705
42	0.000363	0.001032	0.006705
43	0.000401	0.001133	0.006705
44	0.000435	0.001248	0.006705

Teachers' Pension and Annuity Fund of New Jersey

Experience Study for the Period
July 1, 2009 through June 30, 2012

Proposed Assumptions
Rates of Mortality - Female
Base Year = 2003 for Post and 2000 for Pre-Retirement

	Proposed Rates		
	Active	Postretirement	
Age	Ordinary	Healthy	Disabled
45	0.000466	0.001375	0.006705
46	0.000497	0.001516	0.007366
47	0.000527	0.001664	0.008063
48	0.000562	0.001819	0.008798
49	0.000599	0.001981	0.009571
50	0.000645	0.002151	0.010382
51	0.000699	0.002224	0.011229
52	0.000763	0.002356	0.012110
53	0.000837	0.002547	0.013019
54	0.000922	0.002785	0.013947
55	0.001016	0.003066	0.014890
56	0.001119	0.003384	0.015838
57	0.001229	0.003738	0.016789
58	0.001344	0.004118	0.017739
59	0.001463	0.004516	0.018691
60	0.001589	0.004937	0.019655
61	0.001720	0.005400	0.020642
62	0.001863	0.005920	0.021672
63	0.002015	0.006521	0.022764
64	0.002186	0.007217	0.023940
65	0.002374	0.006602	0.025223
66	0.002591	0.007411	0.026635
67	0.002832	0.008229	0.028193
68	0.003107	0.008993	0.029911
69	0.003415	0.009716	0.031802
70	0.003754	0.010497	0.033871
71	0.004131	0.011432	0.036126
72	0.004540	0.012618	0.038566
73	0.004979	0.014024	0.041192
74	0.005445	0.015581	0.044006

Proposed Assumptions
Rates of Mortality - Female
Base Year = 2003 for Post and 2000 for Pre-Retirement

	Proposed Rates		
	Active	Postretirement	
Age	Ordinary	Healthy	Disabled
75	0.005943	0.017342	0.047007
76	0.006468	0.019361	0.050199
77	0.007017	0.021686	0.053591
78	0.007591	0.024255	0.057191
79	0.008186	0.027034	0.061014
80	0.008801	0.030118	0.065081
81	N/A	0.033601	0.069422
82	N/A	0.037578	0.074068
83	N/A	0.041937	0.079054
84	N/A	0.046618	0.084415
85	N/A	0.064019	0.090183
86	N/A	0.071210	0.096389
87	N/A	0.079411	0.103061
88	N/A	0.088669	0.110218
89	N/A	0.098851	0.117875
90	N/A	0.123095	0.126044
91	N/A	0.131575	0.134728
92	N/A	0.140564	0.143932
93	N/A	0.149801	0.153390
94	N/A	0.160669	0.164519
95	N/A	0.170961	0.175058
96	N/A	0.180516	0.184841
97	N/A	0.189183	0.193716
98	N/A	0.196836	0.201552
99	N/A	0.203376	0.208248
100	N/A	0.208719	0.213720
101	N/A	0.215195	0.220351
102	N/A	0.223689	0.229048
103	N/A	0.233837	0.239440
104	N/A	0.245273	0.251150
105	N/A	0.257631	0.263804
106	N/A	0.270547	0.277030
107	N/A	0.283656	0.290453
108	N/A	0.296590	0.303697
109	N/A	0.308986	0.316390