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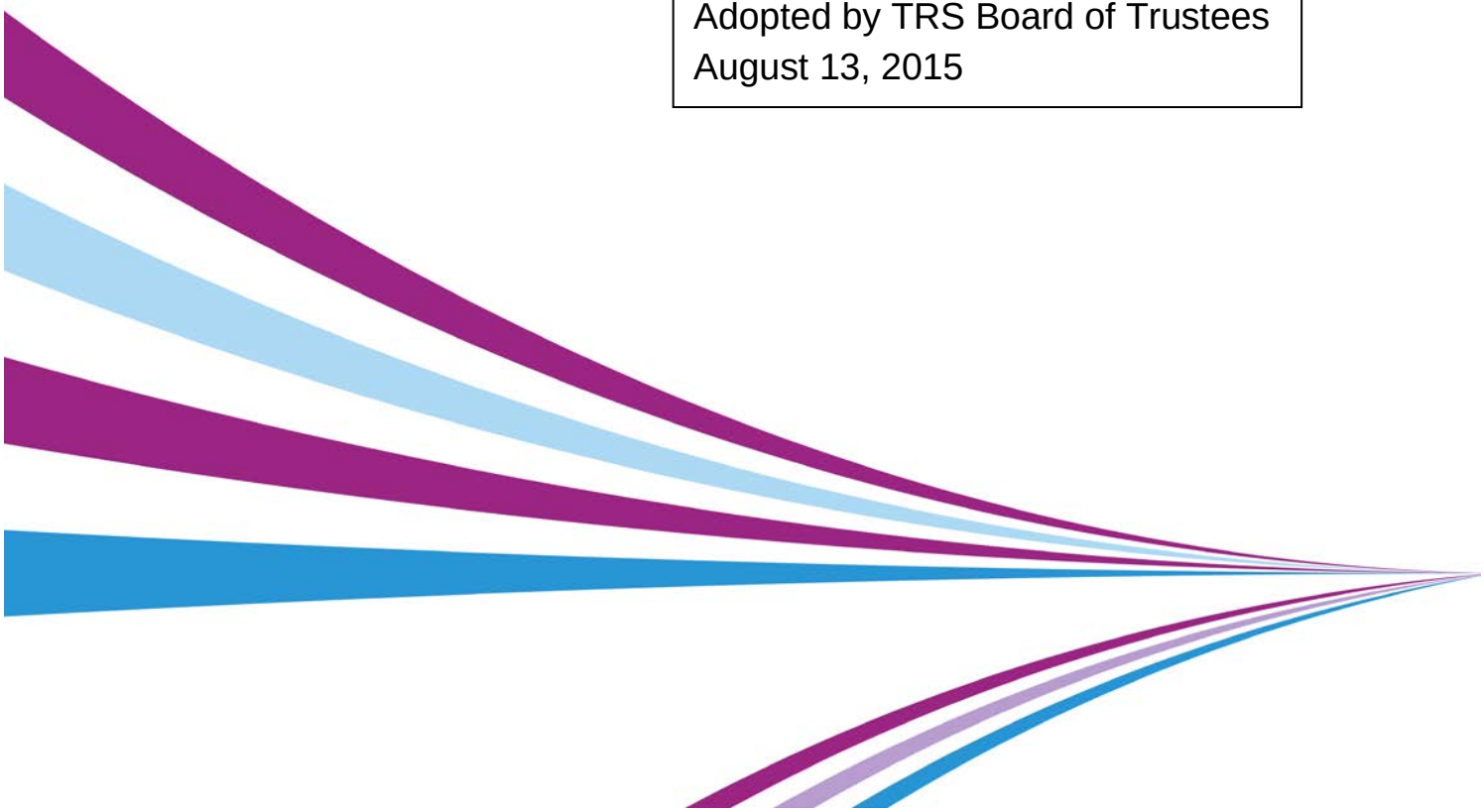
Teachers' Retirement System of the State of Illinois

Investigation of Demographic and Economic Experience

Three-Year Period from July 1, 2011 – June 30, 2014

August 2015

Adopted by TRS Board of Trustees
August 13, 2015



Larry Langer
Principal and
Consulting Actuary

Buck Consultants, LLC.
123 North Wacker Drive
Suite 1000
Chicago, IL 60606

larry.langer@xerox.com
tel 312.846.3669
fax 312.846.3502

Paul Wilkinson
Director and
Consulting Actuary

Buck Consultants, LLC.
123 North Wacker Drive
Suite 1000
Chicago, IL 60606

paul.wilkinson@xerox.com
tel 312.846.3560
fax 312.846.3502

August 13, 2015

Board of Trustees
Teachers' Retirement System
of the State of Illinois
2815 West Washington Street
Springfield, Illinois 62702

Ladies and Gentlemen:

We are submitting herewith our report on the results of an actuarial investigation of the demographic and economic experience of the active members, annuitants, and survivors covered under the Teachers' Retirement System of the State of Illinois for the three-year period July 1, 2011 to June 30, 2014.

This investigation was prepared in accordance with Article 16, Section 176 of the Pension Code governing the System, which requires that at least once in each five-year period, the actuary of the System is to make an actuarial investigation into the mortality, service, and compensation experience of the members, annuitants, and survivors covered under the System. The Board of Trustees has adopted a policy of requiring this investigation every three years. Effective August 3, 2015, Public Act 99-0232 (HB422) requires an investigation at least once every three years.

The results of this review, pending adoption by the Board of Trustees at the August 2015 board meeting, are to be used in the preparation of the June 30, 2015 through June 30, 2017 actuarial valuations, which will determine the funding requirements for fiscal years 2017 through 2019. This report describes the actuarial process employed and identifies the significant results of the investigation. In particular, we are recommending changes in the actuarial assumptions that are used to anticipate:

Assumption	Observed experience relative to expectations	Recommendation	Impact on costs
1. Termination from active employment:	More terminations	Increase rates	Decrease
2. Disability retirement:	Fewer disabilities	Decrease rates	Decrease
3. Regular service retirement:	More retirements	Increase rates	Increase
4. Mortality:	Fewer deaths	Decrease rates	Increase
5. Utilization of ERO:	Lower utilization	Decrease rates	Decrease
6. Optional Service and Sick Leave Service:	Lower utilization	Decrease rates	Decrease
7. Salary and Severance:	Lower increases	Decrease rates	Decrease
8. Tier 2 COLA and Paycap:	Lower increases	Decrease rates	Decrease
9. Investment return:	N/A	Keep the same	N/A

The most significant of the recommended changes are that the post-retirement mortality assumption is revised to reflect improved longevity and future salary increases are expected to be lower by about 1% across the board. Based on the target asset allocation, the current 7.50% assumption is supportable as it is projected to be achieved 60% of the time over the next 30 years. The recommended changes to other assumptions can be viewed as "fine tuning" based on recent experience.

A summary of our recommendations may be found in Section IV beginning on page 17 of the report.

Fiscal Impact – June 30, 2014 Actuarial Accrued Liability
As indicated in Exhibit I of Section IV on page 23 of the report, the proposed revisions in the above assumptions would increase the Actuarial Accrued Liability, or the amount of assets that should be in the fund, from $103.7 billion to $104.2 billion.

Fiscal Impact – June 30, 2014 Normal Cost
Also indicated in Exhibit II of Section IV on page 24 of the report, the proposed revisions in the above assumptions would decrease the Normal Cost, or the cost of benefits accruing during the year, from $2.0 billion to $1.9 billion. The Employer Normal Cost would decrease from $1.0 billion to $0.9 billion.

Section III describes our recommended funding policy based on model actuarial practices rather than the current Illinois state funding law. This funding policy recommendation is the same as that presented at the Board's 2015 retreat.

The Table of Contents, which immediately follows, outlines the material contained in the report.

Sincerely,

Larry Langer, FCA, ASA, EA, MAAA
Principal, Consulting Actuary

Paul R. Wilkinson, A.S.A., E.A., M.A.A.A.
Director, Consulting Actuary

Table of Contents

Section I - Introduction

Public Act 99-0232 (HB 422) requires the state systems of Illinois to conduct experience reviews every three years. Section 16-176 pertains to the TRS experience analysis and requires the lump sum member and employer ERO contributions to be reviewed every three years.

The results of our review are to be presented to and adopted by the Board of Trustees at the August 2015 board meeting, and the recommended new assumptions are to be used in the preparation of the June 30, 2015 actuarial valuation, which determines the funding requirements for fiscal year 2017. We have also prepared the following report, which presents more detailed results of the experience investigation of the System for the three-year period July 1, 2011 through June 30, 2014. Note that this three year period coincides with census information used for the June 30, 2013, 2014 and 2015 actuarial valuations.

The objectives of this investigation are to:

(1) Determine assumptions to anticipate the following events among active members:
  (a) Termination from employment;
  (b) Disability retirement;
  (c) Regular service retirement;
  (d) Death during membership;
  (e) Utilization of the early retirement option (ERO) and determination of contribution sufficiency;
  (f) Optional service purchases;
  (g) Accumulation of sick leave service credit;
  (h) Salary increases; and
  (i) Severance payments.

(2) Determine appropriate rates to anticipate death after retirement among:
  (a) Service retirees,
  (b) Survivors; and
  (c) Disability retirees.

(3) Determine appropriate assumptions for the funding projection;

(4) Determine appropriate assumptions for the rate of inflation and rate of investment return; and

(5) Make recommendations regarding the adoption of the funding policy of the System, which are deemed appropriate by the actuary for adoption by the Board and enactment by the legislature.

Experience Based on Employment Type

Since June 30, 1991, when Substitute and Hourly-Paid employees were first reported to the actuary, the Substitute/Hourly group has constituted approximately 16% - 19% of the total active membership, but has accounted for less than 1% of the total active liability. Therefore, we have performed our review of the active member demographic experience solely with regard to members who were part of the Full Time/Part Time group when the event under study occurred.

Sex Distinct versus Unisex Assumptions

The actuarial assumptions for termination from employment, disability, and rates of mortality have been determined on a sex distinct basis, while annual salary increase rates and the assumptions for service retirement, utilization of ERO, severance pay, optional service credit, and unused and uncompensated sick leave have a unisex basis. Separate male and female results are shown only for the events that are (or were) assumed to have a sex distinct basis.

Experience for Active Members

Separation from Service

Using data provided for the annual actuarial valuations, tabulations were compiled that show the distribution by age and sex of active members who were exposed to the events of termination from employment, death, disability and regular service retirement during the three-year period of the study. The assumed rates of occurrence of these events, which are currently used in preparing annual actuarial valuations, were then applied to the number exposed to determine the expected number of separations in each category.

For each category, the number of actual cases of separation was compared to the expected number and the result of the comparison was expressed as a ratio of actual experience over expected experience.

Early Retirement Option (ERO)

Tabulations were also compiled that provide distributions by age and service of members retiring from active service who were assumed eligible to elect ERO during their fiscal year of retirement. The number of actual cases of ERO retirement was compared to the number in the eligible group to determine the actual rates of utilization of ERO. In addition, the sufficiency of contributions was examined.

Optional Service Purchases and Sick Leave Service Credit

For optional service purchases and unused and uncompensated sick leave service credit, information for retirees who retired with an annuity with effective dates between July 1, 2011 and June 30, 2014, inclusive, was reviewed. Files provided by TRS for the annual actuarial valuations provided details on the following types of service credit at retirement: Regular (including repaid refunds), Optional Service (including Leave/Layoff service, Military service, and Out-of-System service), and Unused and Uncompensated Sick Leave. Using this information for the members who retired from active employment during the period of the study, we could determine the impact that each type of service has on the regular service retirement benefit.

Salary Increases and Severance Pay

Using data provided for the annual actuarial valuations, the expected and actual salaries as of the end of each year were compared to the actual salaries as of the end of each previous year. The comparisons yield an average annual total increase in both expected and actual salaries for the three-year period.

For severance pay, information for annuitants with fiscal years of retirement between 2011 and 2014, inclusive, and tabulations that show distributions of severance pay and other pensionable earnings in the last year of employment, were reviewed.

Experience for Annuitants and Survivors

Investigations of the mortality experience for annuitants and survivors were prepared separately by cause of retirement. The expected deaths were determined by applying the assumed rates of mortality used for valuation purposes to the number of persons exposed in each retirement category. A comparison was then made between the expected and actual deaths in each retirement category, and the results expressed as the ratio of actual experience over expected experience.

Experience for Funding Projection

An analysis of the profile for new entrants was performed on the data provided for the last three actuarial valuations. For each group – full time/regular, part time members, and members who are hourly-paid or substitute teachers – we reviewed the percentage of new hires that will fall into that group, the average annual service credit earned by members of the group, and the average annual full time rate of pay at June 30, 2014 for members of the group. The new member profile will be used in the projection completed annually to determine the funding requirements of state law. We intend to update this profile annually for future valuations.

Experience for Rates of Inflation and Investment Return

The analysis for setting the rates of inflation and investment return included a review of recent past experience, consideration of projections by the System's current investment consultant as well as the System's target asset allocation, a comparison to the current assumptions of other public retirement systems, and a review of long-term past inflation as well as long-term projections of future inflation included in the 2015 OASDI Trustees Report.

Recommendations

Based on the results of our investigation, we are recommending revisions in the actuarial assumptions for (i) termination from employment, (ii) disability retirement, (iii) regular service retirement, (iv) death in active service, (v) death for regular service retirements, (vi) death for survivors, (vii) ERO, (viii) optional service purchases, (ix) sick leave service credit, (x) salary increases, and (xi) severance payments. We are also recommending an updated new member profile for use in the annual funding projection required by state law. In addition to affecting the results of the actuarial valuation and the funding projection, the proposed changes in post-retirement mortality assumptions will affect the money purchase and reversionary annuity factors used in determining TRS benefits, and the factors used to determine School District payments under Section 16-158(f) to cover the liability arising from pay increases greater than 6% per annum in the final average salary period.

The most significant of the recommended changes are that the post-retirement mortality assumption is revised to reflect improved longevity and future salary increases are expected to be lower.

Summaries of Demographic Experience

The summaries attached to this report under Section VI show the comparisons and results of the experience investigation for the demographic assumptions under investigation. For purposes of this experience investigation, the assumptions adopted effective June 30, 2012 were used in determining expected results for the entire three-year period, in order to accurately reflect the emerging trends during that period.

Section II - Discussion Of Investigation Results

DEMOGRAPHIC FACTORS

Separation from Service and Post-Retirement Mortality

We have prepared Tables 1 through 4 attached to Section VI, which summarize the actual and expected separations from active service on account of termination from employment, disability, regular service retirement, and death during the three-year period ended June 30, 2014. Tables 5, 6, and 7, also attached to Section VI, analyze the experience of death after retirement for regular service retirements, survivors, and disability retirements. Separate summaries for males and females are presented for each of these events. The assumptions for separation from active service on account of regular service retirement have been prepared on a unisex basis, and so the experience of regular service retirement is also presented on that basis.

Table 8 summarizes the utilization of ERO and examination of ERO contributions among eligible members retiring from active service, while Table 9 summarizes optional service purchases and sick leave service credit of active members who retired during the period of the study. The assumptions for these types of service are unisex assumptions and so these tables have been prepared on a unisex basis.

The following table presents a summary comparison of actual to expected cases of separation from active service and death after retirement.

SUMMARY COMPARISON OF ACTUAL TO EXPECTED CASES

Event	Ratio of Actual to Expected Experience	
	Males	Females
Termination from Employment		
• With less Than 5 Years of Service	116%	109%
• With 5 or More Years of Service	101%	96%
Disability Retirement	112%	82%
Regular Service Retirement (unisex)	105%	105%
Death in Active Service	65%	69%
Death after Retirement:		
• Regular Service Retirements	102%	96%
• Survivors	113%	113%
• Disability Retirements	213%	412%

For purposes of comparison, the table expresses the ratio of the actual number of cases to the expected number of cases as a percentage. A percentage in excess of 100% indicates that the actual number of cases was greater than the expected number of cases, whereas a percentage of less than 100% indicates that the actual number of cases was less than the expected number of cases.

For example, in regard to terminations from employment with less than 5 years of service, the table shows an entry of 116% for male members. This means that during the three-year experience period the actual number of male members terminating employment was 16% more than the expected number of terminations. Similarly, in regard to terminations from employment with 5 or more years of service, the table shows an entry of 101% for male members. This means that during the three-year experience period the actual number of male members terminating employment was 1% more than the expected number of terminations.

The comments presented below under each category set forth the facts indicated by this experience study with respect to the demographic factors, along with our recommendations for future valuations.

Rates of Termination from Employment

The investigation of the experience of termination from employment for reasons other than disability, death, or retirement, was split into two categories, terminations from employment with less than 5 years of service and 5 or more years of service, which are illustrated in Table 1.

Termination with Less than 5 Years of Service

Over the last three years, we have observed more terminations of nonvested members than expected for both males and females. During the period of the study, the actual cases of termination from employment were approximately 116% of the number predicted by the current rates for males with less than 5 years of service, and 109% of the number predicted for females with less than 5 years of service. We recommend adjusting the rates to bring the ratio of actual to expected terminations with less than 5 years of service to approximately 100%.

Termination with 5 or More Years of Service

Over the last three years, we have observed more terminations of members with 5 or more years of service than expected for both males and females for age 38 and above and fewer below that age. During the period of the study, the actual cases of termination from employment were approximately 101% of the number predicted by the current rates for males with 5 or more years of service, and 96% of the number predicted for females with 5 or more years of service. We recommend increasing rates at younger ages and decreasing them at older ages in such a way that we increase the overall number of expected vested terminations to bring the ratio of actual to expected terminations with 5 or more years of service to approximately 100%.

Rates of Disability Retirement

Table 2 shows that the actual experience of disability retirement was higher than expected for males and lower than expected for females - 112% of expected for males and 82% of expected for females. We recommend decreasing the overall number of expected disability retirements for males and increasing for females in such a way that we increase the overall number of expected disability retirements to bring the ratio of actual to expected disability retirements to approximately 100%.

Rates of Regular Service Retirement

Table 3 provides the experience of service retirement on a unisex basis, the basis recommended for the current assumptions. Note that we reviewed the rates separately for males and females and found that the unisex table continued to provide a good fit to the observed data. During the period of the study the actual cases of regular service retirement were approximately 109% of the number expected for males, 104% of the number expected for females, and 105% of the number expected for males and females combined. The unisex table was first introduced with the June 30, 2007 actuarial valuation. There is no compelling reason to separate rates into sex distinct rates for males and females. While the overall experience is quite close, we recommend some minor changes for some age and service combinations to bring the ratio of actual to expected deaths to approximately 100%.

Rates of Mortality for Active Members

Actual occurrences of mortality were approximately 65% of the expected for male members in active service and 69% of expected for female members in active service. Rates of mortality were lower than expected among almost all age groups. The results are presented in Table 4.

Although the experience differed from our expectations, the number of active member deaths is statistically insignificant. In addition, the assumed rates of mortality are so much smaller than the termination and retirement rates which apply at the same ages that they have little effect on the financial results. We recommend that the mortality rates be decreased and be revised to reflect continued improvement in longevity (consistent with our recommendation for rates of death after retirement following this section).

Rates of Death after Retirement

Separate mortality investigations were performed for regular service retirements, survivors, and disability retirements:

(1) The actual cases of death among regular service-related retirements were 102% of expected for males and 96% of expected for females.

(2) The actual cases of death among survivors were 113% of expected for males and 113% of expected for females.

(3) The actual cases of death among those annuitants who retired on account of disability were 213% of expected for males and 412% of expected for females.

Summaries of the experience of death after retirement are shown in the following tables:

Table 5 Members retired on regular service retirements.
Table 6 Survivors.
Table 7 Members retired on disability retirements.

As noted in prior experience studies, we have seen continued and steady improvement in mortality rates over time. This trend is expected to continue into the future. In fact, Actuarial Standard of Practice No. 35 states that the actuary should "include an assumption as to expected mortality improvement after the measurement date." Accordingly, in our prior experience study we recommended the use of projection scale AA in the projection of the mortality tables to provide a generational approach toward future mortality improvements. Adoption of Scale AA was intended to be an automatic update to the mortality table which would result in smaller updates to mortality when future experience reviews are conducted. The automatic updates provided for in scale AA appeared to be somewhat effective over the 3 years of the investigation based on the actual versus expected counts for service retirements. The mortality table improvement recommendation represents about 20% of the increase in liabilities due to mortality. The other 80% of the increase was due to our recommendation that the MP-2014 mortality improvement scale discussed below replace the Scale AA currently in place.

Since the last experience study, the Society of Actuaries (SOA) conducted a mortality study. They have released a series of mortality tables collectively known as the RP-2014 tables. The SOA also determined that the overall rates of mortality improvement in the US have differed from those predicted by Scale AA. Based on their study, the SOA published an updated mortality improvement projection scale, MP-2014. However, there are many who

believe that the SOA's MP-2014 scale is unduly conservative with unrealistic mortality improvement rates. Emerging experience since the data was collected by the SOA seems to support that contention. Many systems reflect mortality improvements for a fixed number of years into the future, not forever. For TRS, reflecting more mortality improvements results in a higher impact because we assume fully generational mortality where mortality improvements do continue forever. Illinois pension funding requires us to project into the future to 2045, so projection of mortality improvement is a more impactful assumption for TRS than for other systems.

We recommend that the base rates of mortality be updated from adjusted versions of the RP-2000 tables, projected to 2009, to adjusted versions of RP-2014 tables. We recommend the use of adjusted "White Collar" tables for service retirements, no collar adjustment for beneficiaries, and the unadjusted mortality table for disability retirements. The adjustments for service retirements include fewer deaths for females and more deaths for males at some ages. We also recommend that the mortality improvement scale be updated from Scale AA to MP-2014 to reflect rates of mortality improvement indicated in the November 2014 SOA study.

Early Retirement Option (ERO)

Utilization The investigation shows that 3,376 active members who retired on service retirement during the period of the study were eligible to retire on ERO at some point during the fiscal year in which they retired. Focusing only on this group of actual service retirements, we found that 24.4% of the ERO-eligible (823) actually retired on ERO.

Table 8 presents the actual rates of utilization of ERO that occurred during the period of the study. With the last experience review, we lowered the utilization rates to reflect that the modified ERO program is more expensive for members than the ERO program that ended on July 1, 2007. Again with this review, actual rates of utilization came in lower than expected. We recommend that future rates be adjusted to match the utilization that we have seen over the experience period. ERO is currently scheduled to sunset on July 1, 2016 but TRS has directed us to continue to assume that it is permanent.

Contribution Sufficiency The interest on the 0.4% member contribution for all members and the principal of the 0.4% member contribution for members that elect, when added to the ERO lump sum contributions of 14.40% for the members and 29.30% for the employer, should pay for the cost of the increase in liability due to the election of ERO. We reviewed the sufficiency of the 14.40% member and 29.30% employer ERO lump sum contributions to determine if a change should be made to ensure that the ERO is self-sustaining over the next five-year period. These lump sum contributions accounted for 60% of the cost of the increase in liability due to ERO and the 0.4% member contributions were more than sufficient to pick up the remainder of the ERO cost. We recommend that the lump sum contribution rate be decreased.

Optional Service Credit and Credit for Unused and Uncompensated Sick Leave

During the three-year period, data provided on 14,605 service retirements among active members who retired with an annuity give details on the following types of service credit at retirement: Regular (including repaid refunds), Optional Service (including Out of System, Military, and Leave/Layoff service) and Unused and Uncompensated Sick Leave. Summary information about the different types of service credit at retirement for these 14,605 service retirees is provided in Table 9. Table 9 shows that during the period of the study, and averaged over all retirements from active service, optional service at retirement averaged 0.611 years and credit for unused sick leave averaged 1.011 years. Taken together, the sum of these two types of service averaged 1.622 years during the study.

Optional Service Credit

Under the current assumptions, the pension benefit obligation for retirement benefits for active members who have not previously purchased optional service credit is increased to cover the employer cost of out-of-system service purchased in the last two years prior to retirement. During the last experience review (conducted in 2012) total optional service credit at retirement averaged 0.717 years of service, but over the period of the current study the amount of optional service credit at retirement has trended downward to 0.611.

Unused and Uncompensated Sick Leave

The cap on this type of service was increased from one year to two years during fiscal 2003. The member can receive such credit from TRS employers who have verified creditable teaching service. No payment from the member is required to receive such service credit. In the previous experience study, the average amount of unused sick leave service credit at retirement was found to be approximately 1.478 years of service at retirement. During this experience review, the average has decreased to 1.011 years of service at retirement.

Recommended Assumption for Optional Service and Unused & Uncompensated Sick Leave

We recommend it be assumed that the total amount of credit for optional service and unused and uncompensated sick leave service will average 1.6 years over all retirements from active service (the average found in the current study); that optional service at retirement will average 0.6 years over all active service retirements; and that unused and uncompensated sick leave at retirement will average 1.0 years over all active service retirements. In addition, we recommend that the patterns of accrual of each type of service following the patterns found during the current study (and illustrated in Table 9). Other assumptions and methodologies that apply to optional service are as follows:

- Actual optional service credit for each current member is provided by TRS; and
- No additional service purchases will be assumed for members who currently have optional service credit; and
- Members will not purchase service if it does not improve their pension benefit; and
- When optional service is purchased within the last two years prior to retirement, 25% of the cost is covered by member payments and the remaining cost is the responsibility of the employer. (This assumption has been borne out in prior cost studies); and
- The pension benefit obligation covered by future member payments is not included in the liability on the valuation date, but is brought into projected liabilities as those payments are brought into the assets.

ECONOMIC FACTORS

We have prepared Table 10 which summarizes the actual results for the key economic factors affecting the operation of the System.

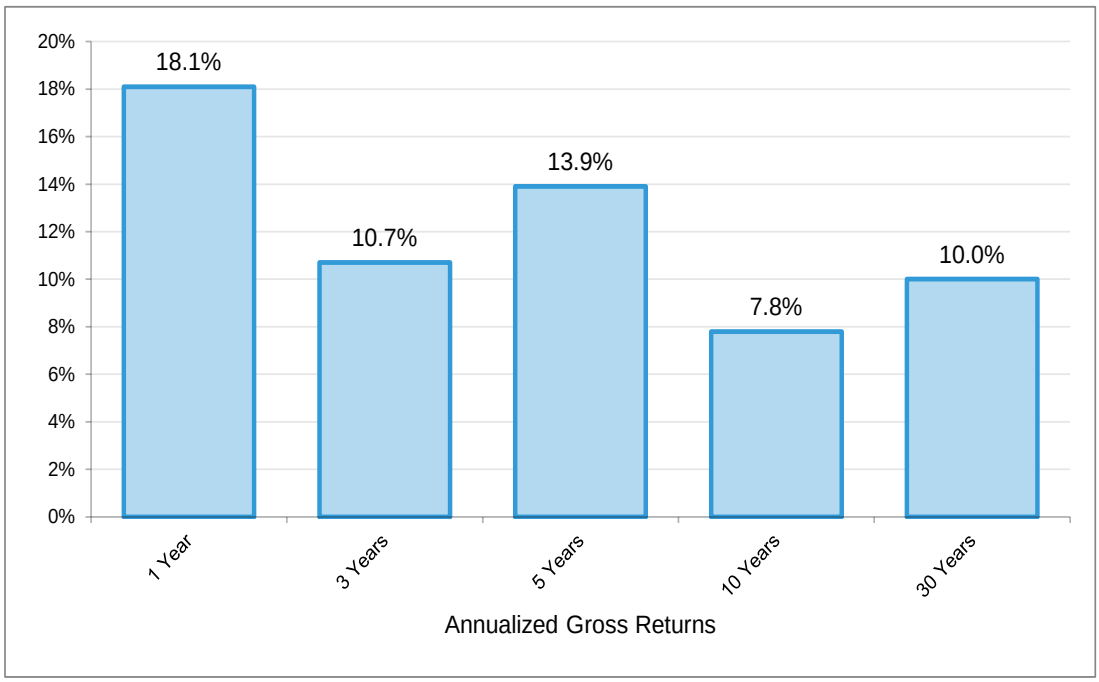
Inflation

The inflation assumption is a component of the investment return assumption, the salary increase assumption, and the new hire payroll projection assumption. The current actuarial assumption is that inflation will average 3.0% per annum on a long-term basis. History (the last 40 - 70 years) argues that long-term inflation should be in the 3% - 4% range. The 2015 OASDI Trustees Report projects that over the long-term (the next 75 years) inflation will average somewhere between 2.0% and 3.4%. The most recent Public Fund Survey of 126 public pension plans shows that 3.0% is the median inflation assumption of survey respondents. Using our forward looking model, we have modeled inflation of the next 10, 20 and 30 year periods to be 2.37%, 2.77% and 3.01% respectively, which reflects a decrease from our May 2011 presentation figures of 3.20%, 3.44% and 3.55% respectively. It is reasonable to maintain the current 3.00% inflation assumption.

Rates of Investment Return

The assumption for the rate of investment return is a two-part assumption: it equals the sum of a long-term inflationary assumption plus an assumption for the real rate of return on System assets. The components of the current 7.50% investment return assumption are 3.00% for inflation plus 4.5% for the real rate of return. As already discussed, we are recommending that the Board maintain the current 3.0% long-term inflation assumption.

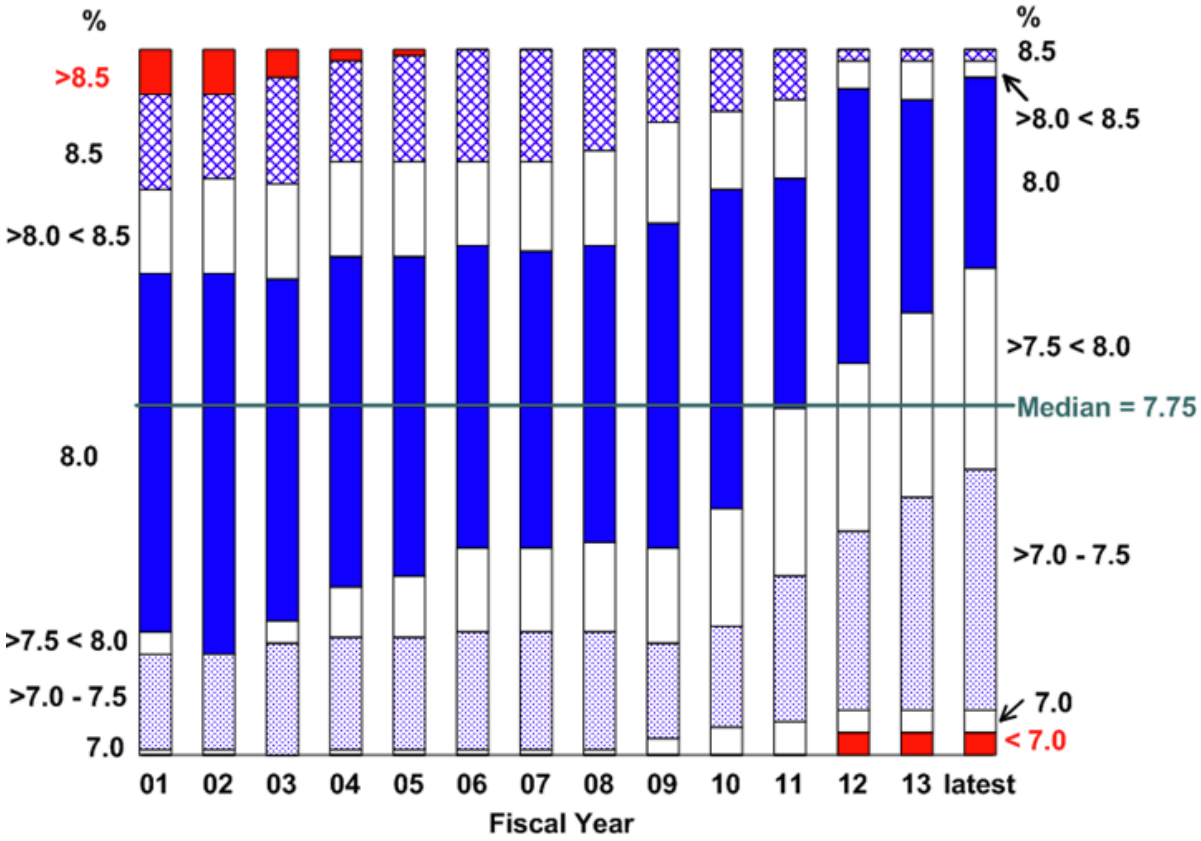
This exhibit contains annualized gross returns over various periods of time ending June 30, 2014. These amounts are gross of expenses, while the assumed rate of return used for the valuation is net of expenses.



Annualized gross returns, after adjusting for expenses, have been greater than the assumed rate of return of 8.00% (8.50% prior to 2012) except for the 10 year period where the returns were dominated by the impact of the Great Recession. Note that the current 7.5% return assumption is for the period beginning June 30, 2014.

As seen in this survey from NASRA, the trend in public pension plan investment return assumptions has been a steady decrease over the past 15 years. TRS has mirrored this pattern, with the Board reducing the assumption from 8.5% to 8.0% effective with the June 30, 2012 valuation and from 8.0% to 7.5% effective with the June 30, 2014 valuation.

Change in distribution of public pension investment return assumptions, FY 01 through May 2015, compiled by NASRA based on Public Fund Survey.



However, short-term historical returns on the funds and trends of returns used by other funds do not provide a solid basis for selecting the investment return assumption used to calculate costs in future years. The reasons for this include:

- In the short-term, actual rates of investment return can be quite volatile, but the assumed rate of investment return is used to fund the present value of benefits payable many years into the future, in some instances for as long as 80 years. Therefore, a review of recent past experience can be useful but is by no means the only basis for setting the long-term assumption used for the valuation and for the funding projection.
- The reasons for the trend in returns will differ based on the specifics of the funds. Changes in asset allocation, the expectation of returns by asset class or the risk tolerance of a fund can result in a change in the return. As such, trends are not an appropriate reason for reducing the return assumptions. That

being said, the TRS Board has reduced the return from 8.50% to 7.50% over the past three years, based upon changes in asset allocation, the expectation of returns by asset class and the risk tolerance of TRS.

With regard to setting a long-term expectation it is more instructive to look at how the System's assets will be invested in the future. The current allocation calls for the following investment mix:

Asset Class	Allocation
Domestic Equity	18.00%
International Equity	18.00%
Fixed Income	16.00%
Real Estate	15.00%
Private Equity	14.00%
Real Return	11.00%
Absolute Return	8.0%
Short Term Invest.	0.0%
	100.00%

Based on the Board's current asset allocation policy we have estimated nominal and real returns over 10, 20 and 30 year periods as follows:

Compound (Geometric) Returns over Projected Periods							
	1-Year	5-Year	10-Year	15-Year	20-Year	25-Year	30-Year
Nominal							
75th Percentile	11.13%	9.50%	9.71%	9.99%	10.27%	10.46%	10.48%
60th Percentile	8.21%	7.74%	8.14%	8.60%	8.83%	9.29%	9.41%
50th Percentile	6.64%	6.63%	7.12%	7.82%	8.22%	8.49%	8.77%
40th Percentile	4.86%	5.53%	6.39%	7.07%	7.50%	7.82%	8.11%
25th Percentile	1.75%	3.46%	5.12%	5.94%	6.42%	6.78%	7.13%
Real							
75th Percentile	9.09%	7.47%	7.16%	7.18%	7.26%	7.29%	7.30%
60th Percentile	6.38%	5.67%	5.85%	6.05%	6.16%	6.31%	6.38%
50th Percentile	4.55%	4.54%	4.99%	5.35%	5.57%	5.76%	5.82%
40th Percentile	2.84%	3.35%	4.07%	4.66%	4.93%	5.09%	5.34%
25th Percentile	-0.24%	1.50%	2.83%	3.50%	3.98%	4.12%	4.38%

Current standards of practice suggest the use of an assumption that falls within the 40th and 50th percentile of projected returns based on the long term asset allocation. This is a change from the last time we reviewed the assumed rate of return, where the Actuarial Standards of Practice defined the range as between the 25th and 75th percentiles. Under these guidelines, Buck restricted the range to returns that were between the 25th and 50th percentiles.

The current assumption of 7.50% is expected to be achieved between 40% and 50% of the time over the next 10 years. There are currently unrecognized asset gains to partially offset returns below 7.5%. Over longer periods, we expect the return to be achieved over 60% of the time based on Buck expectations. The above percentiles are based on projections performed by Buck of the broad asset classes within which TRS is invested. Projections performed by RVK, as well as other investment consultants will differ based on their understanding of the markets, which are translated into the assumptions they use. In addition, projections performed by RVK make use of more style specific assumptions for some of their asset classes, where Buck makes use of broad indexes. While projections performed by others will result in the assumed rate of return falling into different percentiles, the

general conclusion is unchanged. A lower assumed rate of return, all else being equal, is more likely to be achieved

Based on the above, the 7.50% investment return assumption can be maintained.

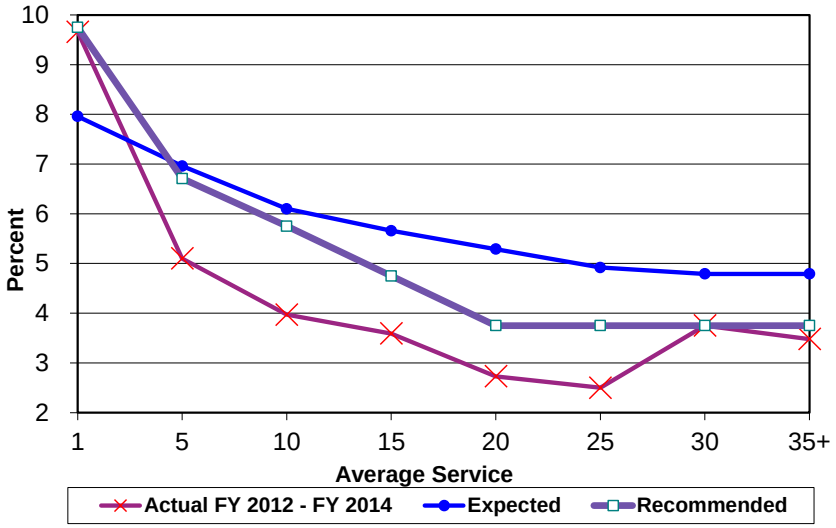
Rates of Salary Progression

The growth in average annual salary is presented in Table 10.

Components of the Salary Increase Assumption

During the three year period, actual salary increases have been less than expected. This is a continuation of the trend observed in the last experience review. We recommend that the overall salary increases be reduced generally by 1% across the board.

The components of the salary increase assumption are inflation, real wage growth, and merit or seniority increases. As noted above, we are recommending that inflation assumption of 3.00% per annum be maintained. Merit or longevity increases are expected to vary by age and/or service, while the inflation and real wage growth assumptions apply equally to all members. Pay at hire for new members and the total payroll of the entire active group are expected to grow at a rate equal to the sum of the inflation and real wage growth assumptions. Starting pays and total payroll are assumed to grow faster than inflation alone due to increases in productivity in the economy at large, and due to the fact that employers must compete for employees. We are recommending that the current 0.75% real wage growth component of the salary increase assumption be maintained. As a result, we recommend no change in our recommended increase in payroll of 3.75% per annum (3.00% inflation plus 0.75% real wage growth). In the past, we have expected the merit and longevity increases to vary by age. We recommended that this assumption be changed to vary by service. We recommend that the merit and seniority component of the salary increase assumption be decreased by roughly 1.00% for all years. As seen on the chart below, the recommendation still provides for some margin over what has been observed over the past several years. The resulting salary increases range from 9.75% during the first year of service to 3.75% from 20 years of service and beyond.



This decrease in assumption does result in lower projected benefits for members which results in lower liabilities. Lower liabilities suggest that employer contributions will be lower as well. But since contributions are developed as a level % of payroll, the impact of lower future salary increases on the current contribution is to frontload contributions.

Severance Pay

During the three-year period, data provided on 14,605 service retirements among active members who retired with an annuity give details about pensionable severance payments received at retirement. These payments are included in the calculation of final average salary. Analysis of this data shows that, during the three-year period of the study, 2,857 retirements from active service – or just under 20% of regular service retirements – received severance payments totaling $22.0 million. The $22.0 million in severance payments was equal to 1.84% of other pensionable earnings received by the 2,857 members in their last year of employment. The data indicated that the percentage of retirees with severance increases with the amount of service at retirement.

While the number of retirees with severance was on target overall, the actual amount of severance was much less. We recommend the assumptions be adjusted to reflect this. The net impact of our recommendation is a net decrease in costs due to severance pay.

FUNDING PROJECTION ASSUMPTIONS

New Member Profile

In order to perform the projection to 2045 required by state law, a profile of the members who will be hired after the valuation date must be created. We currently use, and continue to recommend, separate profiles for the Full Time/Part Time and Substitute/Hourly active member groups. The profiles are organized by sex and by age at hire. For each group the profiles specify, for each age and sex category, the percentage of new hires that fall into that category, the average annual service credit that will be earned throughout the member's career, and the average annual full time rate of pay at hire as the profile date. In the past we have created a profile with each experience review to be used for future valuations until the next experience review. With each valuation we have made adjustments to the annual full time rate of pay based on the overall pay increase of the group. While the percentage of new hires that fall into each age and sex category has not changed, the annual full time rate of pay has varied, suggesting that using global pay increases to each category could be improved by explicitly updating the profile each year. As a result, we recommend that beginning with the June 30, 2015 actuarial valuation, we create a new member profile based on census information provided for the last three years. We recommend that this table be updated for each valuation.

In addition, since the projection to 2045 assumes that new members will be hired each year in the future, we need an assumption that allows a reasonable projection of the rate of pay at hire in future years. Pay at hire is expected to grow at a rate equal to the sum of the inflation and real wage growth assumptions (which were discussed in the review of the salary increase assumption, above). Our recommendation is to maintain the current 3.75% per annum growth rate. As explained in the salary increase section, above, 3.00% of the increase is attributable to inflation, and the remaining 0.75% is attributable to real wage growth.

We assume the active membership of the System will remain constant in number, with no change in the size of either the Full Time/Part Time group or the Substitute/Hourly group. We are not recommending a change in this assumption at this time.

Section III – Commentary on Current Funding Policy

The Funding Methodology is the funding policy for a Public Employee Retirement System (PERS). While there are no mandated funding policies for PERS, several stakeholder groups have provided white papers on the subject:

1. Conference of Consulting Actuaries Public Plans Community White Paper "Actuarial Funding Policies and Practices for Public Pension Plans" (Oct. 2014) http://www.ccactuaries.org/publications/news/cca-ppc-white-paper.cfm

2. American Academy of Actuaries Issue Brief "Objectives and Principles for Funding Public Sector Pension Plans" (Feb. 2014) http://www.actuary.org/files/Public-Plans_IB-Funding-Policy_02-18-2014.pdf

3. California Actuarial Advisory Panel White Paper "Model Actuarial Funding Policies and Practices for Public Pension and OPEB Plans" (Mar. 2013) http://www.sco.ca.gov/Files-ARD/BudLeg/CAAP_Funding_Policies_w_letter.pdf

4. Report from the Pension Funding Task Force 2013 (convened by the Center for State and Local Government Excellence) "Pension Funding: A Guide for Elected Officials" http://www.nctr.org/pdf/PensionFundingGuideBrief_Final.pdf

5. GFOA Best Practice "Funding Defined Benefit Pensions" (Jun. 2012) http://www.gfoa.org/funding-defined-benefit-pensions (no PDF)

6. GFOA Best Practice "Core Elements of a Pension Funding Policy" (Mar. 2013) http://www.gfoa.org/core-elements-funding-policy (no PDF)

7. Society of Actuaries Blue Ribbon Panel on Public Pension Plan Funding "Report of the Blue Ribbon Panel on Public Pension Plan Funding" (Feb. 2014) (report, summary, video and guide) https://www.soa.org/blueribbonpanel/

These papers suggest that there are three broad goals when formulating a funding policy for a PERS.

- *Sufficiency* - the funding target should be the value of benefits allocated to the benefits accrued to date.

- *Intergenerational equity* – taxpayers should pay for workers' pensions while those workers are providing their services – fund for benefits over the worker's career.

- *Stability of contributions* – while stable contributions are easier to budget for, stability should not be achieved at the expense of the first two considerations.

Actuarial Methods describe the funding policy for the PERS. Actuarial Methods generally are comprised of the three components below:

- *Actuarial Cost Methods* allocate costs to the actuarial accrued liability (i.e. the amount of money that should be in the PERS fund) for past service and normal cost (i.e. the cost of benefits accruing during the year) for current service to allow for systematic payment of the costs over a member's career

- *Amortization Payment for UAAL Methods* determine the payment schedule for unfunded actuarial accrued liability (UAAL)

- *Asset Valuation Methods* smooth or average the market value returns over time to alleviate contribution volatility that results from market returns that differ from the investment return assumption used in the actuarial valuation

We have broadly referred to funding of a PERS outlined above as "Actuarial Math." We have shown two versions of Actuarial Math in the past few years:

- Contribution based on Generally Accepted Actuarial Standards – since the inception of GASB 25 and 27 in the mid-1990s, the minimum annual required contribution (ARC) contained in those standards has served as the de facto minimum funding standard for a PERS. The basis for this version of Actuarial math is the projected unit credit cost method, with a 30-year open level percent of pay amortization.
- Based on keeping the unfunded actuarial accrued liability (UAAL) from growing – recognizing that the contribution based on Generally Accepted Actuarial Standards is not sufficient to reduce the unfunded liability from year to year, we have shown this amount. This policy is an improvement over the above.

Neither of these Actuarial Math policies is optimal, primarily because they are not projected to fully fund the unfunded liability. That being said, since GASB 25 was enacted 20 years ago, the Illinois Math policy used has underfunded TRS by almost $16 billion when compared to the first policy; when compared to the second policy, this shortfall increases from $16 billion to $45 billion.

The funding of TRS by the State of Illinois does not follow even the minimum Actuarial Math. The State has systematically underfunded TRS using Illinois Math, which has systematically underfunded TRS by:

- Initially selecting a 50 year period over which to pay down unfunded actuarial accrued liability
- Back loading the 50 year plan by using a 15 year period to ramp up contributions to the ultimate level
- Establishing 90% of the actuarial accrued liability as the funding target
- Using the projected unit credit cost method which understates the funding target compared to the more common entry age normal cost method
- Reducing contributions for fiscal year ended June 30, 2006 and 2007
- Reducing contributions in fiscal year ended June 30, 2011 by introducing an actuarial value of assets
- Reducing contributions to fully reflect the impact of Tier II provisions before the reduction in benefit accruals occurred

The de facto funding policy under GASB 25 and 27 was effectively eliminated with the introduction of GASB 67 and 68 two years ago. In the interim, public sector actuaries have reviewed funding of public sector pensions. While the framework remains the same, the parameters have been refined.

- Actuarial Cost Method based on the entry age normal cost method, which has a higher target than the projected unit credit method under Illinois Math
- Asset Valuation Method which smooths returns over a five year period without a corridor, similar to that prescribed under the Illinois Pension Code
- Amortization Method which at a minimum pays down the unfunded liability each year. A closed level percent of pay amortization of 15 to 20 years or closed level dollar amortization of no more than 25 years achieves this.

We propose that the following Actuarial Math 2.0 be considered as the next generation of actuarial math, replacing the two versions that have been certified by the Board in the past

- Replace the projected unit credit cost method with the entry age normal cost method
- Keep the current asset valuation method (including no corridor)
- Update amortization policy as follows:
    - 20 year closed amortization of UAAL

- Use layered amortization, with new UAAL being amortized over 20 years regardless of source
- Amortization payment increase at the rate of future State revenue growth.
- Minimum total contribution is no less than the normal cost in any given year

The funded ratio for TRS is among the worst in the United States. This is due to:

- A lack of commitment from policy makers to keep TRS well-funded
- A history of appropriating and contributing amounts far below that which a prudent actuary would recommend
- A funding policy that systematically underfunds TRS
- Changes in benefits that were unfunded and granted when the funded ratio of TRS was quite low

Funding reform needs to occur for TRS or the benefits of its membership could be compromised. We recommend that the Actuarial Math 2.0 policy above replace the funding policy prescribed in the Illinois Pension Code.

Section IV - Summary Of Recommendations And Fiscal Impact

Based on our analysis of the results of the experience investigation, we recommend that certain changes in the actuarial basis of the System be evaluated. A summary of those changes and the cost impact per change is as follows:

Assumption	Observed experience relative to expectations	Recommendation	Impact on costs
1. Termination from active employment:	More terminations	Increase rates	Decrease
2. Disability retirement:	Fewer disabilities	Decrease rates	Decrease
3. Regular service retirement:	More retirements	Increase rates	Increase
4. Mortality:	Fewer deaths	Decrease rates	Increase
5. Utilization of ERO:	Lower utilization	Decrease rates	Decrease
6. Optional Service and Sick Leave Service:	Lower utilization	Decrease rates	Decrease
7. Salary and Severance:	Lower increases	Decrease rates	Decrease
8. Tier 2 COLA and Paycap:	Lower increases	Decrease rates	Decrease
9. Investment return:	N/A	Keep the same	N/A

We recommend that the actuarial assumptions be amended as shown on the following pages:

(1) **Terminations** The assumed rates of termination from employment should be adjusted to more closely reflect the pattern of terminations by age, and to bring the combined male/female ratio of actual to expected terminations to 100% overall. The tables below shows at sample ages the proposed rates of nonvested and vested termination from employment:

PROPOSED RATES OF TERMINATION FROM EMPLOYMENT

Incidence of Termination from Employment – Nonvested Members		
Age	**Male**	**Female**
25	9.5%	8.4%
30	8.8%	11.3%
35	10.2%	11.6%
40	12.3%	10.8%
45	12.6%	10.3%
50	16.7%	11.8%
55	20.7%	17.0%
60	16.4%	16.9%
65	30.2%	35.0%
Incidence of Termination from Employment – Vested Members		
Age	**Male**	**Female**
25	6.0%	6.5%
30	2.8%	5.0%
35	2.1%	3.5%
40	1.7%	2.2%
45	1.5%	1.9%
50	1.9%	1.7%
55	5.0%	3.8%
60	4.6%	4.0%
65	4.6%	4.0%

(2) **Disability** The assumed rates of disability should be reduced so that the ratios of actual to expected shown in Table 2 are increased to approximately 100% to more closely reflect recent experience. The table below shows at sample ages the proposed rates of disability.

PROPOSED RATES OF DISABILITY

Incidence of Disability		
Age	**Male**	**Female**
25	.029%	.030%
30	.023%	.061%
35	.030%	.069%
40	.051%	.112%
45	.068%	.140%
50	.117%	.192%
55	.138%	.240%
60	.179%	.227%
65	.536%	.410%

(3) **Retirement** The assumed rates of regular service retirement should be adjusted to better fit the actual age-and-service-related pattern of retirements observed during the experience period. The assumed rates of retirement are shown in the table below.

PROPOSED RATES OF REGULAR SERVICE RETIREMENT

Incidence of Regular Service Retirement Among Eligible Active Members					
	Active Service Rounded to Nearest Year on June 30 prior to Retirement				
Age *	5 – 18	19 – 30	31	32 – 33	34+
54		6%	8%	38%	60%
55		10%	8%	38%	60%
56		7%	8%	38%	45%
57		7%	12%	40%	45%
58		7%	12%	40%	40%
59		25%	38%	60%	40%
60	14%	30%	48%	60%	40%
61	14%	27%	33%	45%	40%
62	14%	27%	50%	45%	40%
63	14%	27%	38%	50%	40%
64	24%	37%	50%	60%	40%
65	26%	37%	50%	50%	40%
66	26%	37%	50%	50%	40%
67	26%	37%	50%	50%	40%
68	26%	33%	50%	50%	40%
69	26%	33%	50%	50%	40%
70	100%	100%	100%	100%	100%

*Age rounded to nearest year on June 30 prior to retirement

(4) **Mortality** In general, the assumed mortality rates should be changed to reflect actual recent experience for TRS members. The proposed mortality rates are based on the RP-2014 mortality tables. Note that for all tables below, projected annual improvements in mortality are based on the Society of Actuaries Mortality Projection Scale MP2014.

Active Members – the proposed rates of death in active service are based on the RP-2014 White Collar table.

Service Retirees – the proposed rates of death among members retired on regular service retirement or terminated vested are based on the RP-2014 White Collar table.

Disability Retirees – the proposed rates of death among members retired on disability retirement are based on the RP-2014 Disabled table.

Surviving Beneficiaries – the proposed rates of death among beneficiaries of deceased members are based on the RP-2014 table.

(5) **ERO** ERO is currently scheduled to sunset on July 1, 2016 but TRS has directed us to continue to assume that it is permanent.

The rates of utilization of ERO should be set to actual rates experienced during the period of the study. The recommended rates of utilization of ERO are shown in the following table.

PROPOSED RATES OF UTILIZATION OF ERO

Utilization of ERO among All Active Service Retirees**						
	Age Rounded to Nearest Year on June 30 prior to Retirement					
Service *	54	55	56	57	58	59
19 – 30	0%	50%	58%	49%	58%	51%
31	0%	65%	66%	44%	50%	64%
32	0%	82%	52%	52%	38%	52%
33	0%	10%	11%	12%	6%	8%

* Active member service rounded to nearest year on June 30 prior to retirement

** ERO Utilization Rates are applied only to members who have less than 35 years of total service at the assumed retirement date (including assumed sick leave and optional service purchased at retirement). Based on the sick leave and optional service assumptions, the majority of members with 33 years of service at the beginning of the year of retirement will not be assumed to retire on ERO because they will be assumed to have at least 35 years of service at retirement.

In addition, ERO Utilization Rates are not applied to members whose pension under the ERO program would be less than their money purchase benefit.

We reviewed the sufficiency of the 14.40% member and 29.30% employer ERO lump sum contributions to determine if a change should be made. Our recommendation is as follows:

PROPOSED LUMP SUM RATES

Assumed Interest Rate	7.50%
Lump Sum Rates Needed to Achieve 100% Total	
Member	10.8%
School District	22.0%
Total	32.8%

(6) **Optional Service and Sick Leave Service** The pension benefit obligation for retirement benefits for active members who have not previously purchased optional service – and whose pension benefit would be improved by such a purchase - should continue to be increased to cover the employer cost of optional service purchased in the last two years prior to retirement. No additional optional service purchases will be assumed for active members who already have optional service credit. Representative amounts purchased at retirement are as follows:

PROPOSED AMOUNTS OF OPTIONAL SERVICE PURCHASED AT REGULAR SERVICE RETIREMENT

Regular Service at Retirement	Maximum Service Purchased
10 years	0.204 years
20 years	0.537 years
25 years	1.029 years
30 years	1.424 years
34 or more	None

When optional service is purchased within the last two years prior to retirement, 25% of the cost is borne by member payments and the remaining cost is the responsibility of the employer. The PBO covered by future member payments is not included in the liability on the valuation date, but is brought into projected liabilities as those payments are brought into the assets.

Sick Leave Service Credit An assumption for unused and uncompensated sick leave service credit at retirement should be retained, and the current assumed rate of accrual of such service should be decreased to reflect the experience of the last three years. Representative assumed amounts of unused and uncompensated sick leave service are as follows:

PROPOSED AMOUNTS OF SICK LEAVE SERVICE CREDIT AT REGULAR SERVICE RETIREMENT

Regular Service at Retirement	Sick Leave Service Credit
20 years	0.938 years
25 years	1.115 years
30 years	1.276 years
34 years	1.000 years
35 or more	None

(7) **Salary and Severance Pay**

Salary The age based salary increase assumption should be replaced with a service based assumption. The Full Time/ Part Time average salary increase assumption should be lowered across the board. The additional 0.25% per annum increase used to cover employment type and status changes should be combined with the rest of the assumption. The components of the salary increase assumption will maintain the 3.00% inflation; 0.75% real wage growth; and reduce merit/longevity increases by roughly 1% across the board.

PROPOSED SERVICE-RELATED SALARY INCREASE ASSUMPTION

Service	Annual Salary Increase
1	9.750 %
2	7.750
3	7.229
4	6.962
5	6.711
10	5.750
15	4.750
20 and above	3.750

Severance Pay The percent of retirees from active service assumed to receive severance payments, and the amount of such severance payments, should be based on the assumption of 20% of retirees will receive severance pay and the average severance payment will be 3% of other pensionable earnings in the last year of employment.

(8) **Investment Return** We recommend that the Board retain the current 7.50% investment return, which equates to a real return of 4.50% and inflation of 3.00%.

(9) **New Hires after Valuation** to be based on the census information provided for the three years up to and including the valuation.

Fiscal Impact

Exhibits I and II, below, illustrate the estimated fiscal impact of the proposed changes on the cost of benefits provided by the system.

FISCAL IMPACT OF PROPOSED REVISIONS IN ACTUARIAL ASSUMPTIONS

EXHIBIT I

CHANGE IN ACTUARIAL ACCRUED LIABILITY (AAL)
AS OF JUNE 30, 2014
($ Millions)

Actuarial Assumption Revision	Actuarial Accrued Liability		
	Amount	Change	Cumulative Change
1. June 30, 2014 Valuation	$ 103,740.4	$ -	$ -
2. Termination from active employment:	103,700.5	(39.9)	(39.9)
3. Disability retirement:	103,676.6	(23.9)	(63.8)
4. Regular service retirement:	103,715.1	38.5	(25.3)
5. Mortality:	106,547.7	2,832.6	2,807.3
6. Utilization of ERO:	106,476.8	(70.9)	2,736.4
7. Optional Service and Sick Leave Service:	106,264.0	(212.8)	2,523.6
8. Salary and Severance:	104,243.3	(2,020.7)	502.9

EXHIBIT II

CHANGE IN TOTAL NORMAL COST
(Shown as a % of covered payroll)

Note that the amounts below are the total normal cost are gross of member contributions.

Actuarial Assumption Revision	Normal Cost		
	Amount	Change	Cumulative Change
1. Fiscal Year 2016	19.69%		
2. Termination from active employment:	19.64%	-0.05%	-0.05%
3. Disability retirement:	19.61%	-0.03%	-0.08%
4. Regular service retirement:	19.63%	0.02%	-0.06%
5. Mortality:	20.05%	0.42%	0.36%
6. Utilization of ERO:	20.01%	-0.04%	0.32%
7. Optional Service and Sick Leave Service:	19.88%	-0.13%	0.19%
8. Salary and Severance:	18.51%	-1.37%	-1.18%

Section V

Comparison of Actual And Expected Experience During Three-Year Period From July 1, 2011 Through June 30, 2014

Table 1

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

NONVESTED TERMINATIONS
TERMINATION FROM EMPLOYMENT BEFORE RETIREMENT
CHANGE FROM ACTIVE STATUS TO INACTIVE STATUS
OR REFUND TERMINATION

MALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	5	1.6	13	321%	38.5
23 - 27	549	436.3	6,119	126%	9.0
28 - 32	450	411.1	5,229	109%	8.6
33 - 37	204	191.8	2,171	106%	9.4
38 - 42	146	127.0	1,190	115%	12.3
43 - 47	98	86.4	745	113%	13.2
48 - 52	92	69.2	541	133%	17.0
53 - 57	65	53.1	331	122%	19.6
58 - 62	37	44.8	222	83%	16.7
63 - 67	16	14.7	70	109%	22.9
Over 67	-	0.4	2	0%	-
TOTAL	1,662	1,436.4	16,633	116%	10.0

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study

Table 1 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

NONVESTED TERMINATIONS
TERMINATION FROM EMPLOYMENT BEFORE RETIREMENT
CHANGE FROM ACTIVE STATUS TO INACTIVE STATUS
OR REFUND TERMINATION

FEMALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	5	8.0	61	62%	8.2
23 - 27	2,023	1,893.0	24,276	107%	8.3
28 - 32	1,609	1,522.3	15,084	106%	10.7
33 - 37	638	598.1	5,625	107%	11.3
38 - 42	454	373.3	3,908	122%	11.6
43 - 47	338	283.3	3,173	119%	10.7
48 - 52	283	231.3	2,307	122%	12.3
53 - 57	192	167.7	1,186	114%	16.2
58 - 62	96	77.3	501	124%	19.2
63 - 67	24	26.4	79	91%	30.4
Over 67	4	4.0	10	100%	40.0
TOTAL	5,666	5,184.7	56,210	109%	10.1

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study

Table 1 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

VESTED TERMINATIONS
TERMINATION FROM EMPLOYMENT BEFORE RETIREMENT
CHANGE FROM ACTIVE STATUS TO INACTIVE STATUS
OR REFUND TERMINATION

MALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	-	-	-	0%	-
23 - 27	15	16.6	325	90%	4.6
28 - 32	257	357.5	9,797	72%	2.6
33 - 37	316	332.8	14,408	95%	2.2
38 - 42	240	223.3	14,500	107%	1.7
43 - 47	207	190.0	12,214	109%	1.7
48 - 52	182	132.8	9,759	137%	1.9
53 - 57	123	96.5	3,765	127%	3.3
58 - 62	45	25.4	636	177%	7.1
63 - 67	-	-	-	0%	-
Over 67	-	-	-	0%	-
TOTAL	1,385	1,374.9	65,404	101%	2.1

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study

Table 1 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

VESTED TERMINATIONS
TERMINATION FROM EMPLOYMENT BEFORE RETIREMENT
CHANGE FROM ACTIVE STATUS TO INACTIVE STATUS
OR REFUND TERMINATION

FEMALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	-	-	-	0%	-
23 - 27	106	104.8	2,060	101%	5.1
28 - 32	1,791	2,079.1	36,483	86%	4.9
33 - 37	1,527	1,738.2	41,913	88%	3.6
38 - 42	830	808.8	37,839	103%	2.2
43 - 47	615	588.7	33,705	104%	1.8
48 - 52	540	468.6	32,077	115%	1.7
53 - 57	575	458.7	18,627	125%	3.1
58 - 62	149	115.6	3,013	129%	4.9
63 - 67	-	-	-	0%	-
Over 67	-	-	-	0%	-
TOTAL	6,133	6,362.6	205,717	96%	3.0

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study

Table 2

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DISABILITY RETIREMENTS

MALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	-	-	13	0%	-
23 - 27	-	1.8	6,444	0%	-
28 - 32	1	4.1	15,026	25%	0.01
33 - 37	1	5.7	16,579	18%	0.01
38 - 42	6	7.8	15,690	77%	0.04
43 - 47	8	7.5	12,959	107%	0.06
48 - 52	19	9.3	10,300	204%	0.18
53 - 57	24	10.2	8,862	236%	0.27
58 - 62	8	10.1	5,330	79%	0.15
63 - 67	4	7.1	1,572	56%	0.25
Over 67	1	0.9	253	115%	0.40
TOTAL	72	64.3	93,028	112%	0.08

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study

Table 2 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DISABILITY RETIREMENTS

FEMALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	-	0.0	61	0%	-
23 - 27	3	17.5	26,336	17%	0.01
28 - 32	23	69.7	51,567	33%	0.04
33 - 37	25	55.4	47,538	45%	0.05
38 - 42	39	51.7	41,747	75%	0.09
43 - 47	53	42.6	36,878	124%	0.14
48 - 52	69	55.1	34,384	125%	0.20
53 - 57	87	78.3	35,977	111%	0.24
58 - 62	46	50.2	24,895	92%	0.18
63 - 67	13	14.1	6,468	92%	0.20
Over 67	-	0.8	715	0%	-
TOTAL	358	435.3	306,566	82%	0.12

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study.

Table 3

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

REGULAR SERVICE RETIREMENTS
ACTUAL NUMBER OF SERVICE RETIREMENTS DURING THE STUDY
WITH AN ANNUITY OR A SINGLE-SUM BENEFIT

MALES AND FEMALES

Actual Number of Retirements						
	Service*					
Age**	5-18	19-30	31	32-33	34+	Total
54	-	192	36	214	3	445
55	-	321	35	660	35	1,051
56	-	192	28	492	255	967
57	-	201	34	361	342	938
58	-	214	23	255	309	801
59	250	841	82	311	279	1,763
60	329	782	92	219	251	1,673
61	280	547	40	93	176	1,136
62	250	445	45	69	136	945
63	174	350	26	55	106	711
64	212	343	31	54	89	729
65	167	220	17	24	63	491
66	104	128	6	8	31	277
67	55	81	5	5	45	191
68	36	43	1	2	15	97
69	23	32	1	4	12	72
70+	51	60	2	9	34	156
Total	1,931	4,992	504	2,835	2,181	12,443

* Active member service rounded to nearest year on June 30 prior to retirement
** Age rounded to nearest year on June 30 prior to retirement

The ratio of actual to exposed provides the actual rates of separation that occurred during the study.

Table 3 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

REGULAR SERVICE RETIREMENTS
EXPECTED NUMBER OF SERVICE RETIREMENTS DURING THE STUDY
WITH AN ANNUITY OR A SINGLE-SUM BENEFIT

MALES AND FEMALES

Expected Number of Retirements						
	Service*					
Age**	5-18	19-30	31	32-33	34+	Total
54	-	222	85	365	2	675
55	-	335	91	647	21	1,095
56	-	209	61	483	176	929
57	-	204	42	334	236	817
58	-	213	27	230	234	703
59	320	796	72	231	212	1,631
60	278	710	86	154	187	1,416
61	276	494	36	90	144	1,040
62	221	427	31	71	112	862
63	165	326	24	50	87	653
64	179	303	19	38	69	608
65	140	194	14	20	47	416
66	90	112	8	12	27	250
67	54	68	4	8	21	154
68	36	42	1	5	10	95
69	23	30	0	4	10	68
70+	155	134	7	17	104	417
Total	1,939	4,819	610	2,760	1,700	11,827

* Active member service rounded to nearest year on June 30 prior to retirement
** Age rounded to nearest year on June 30 prior to retirement

Table 3 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

REGULAR SERVICE RETIREMENTS
MEMBERS ELIGIBLE FOR SERVICE RETIREMENT DURING THE STUDY
WITH AN ANNUITY OR A SINGLE-SUM BENEFIT

MALES AND FEMALES

Number of Active Members Exposed						
	Service*					
Age**	5-18	19-30	31	32-33	34+	Total
54	-	3,700	711	961	5	5,377
55	-	3,352	455	1,703	53	5,563
56	-	2,984	383	1,270	551	5,188
57	-	2,920	265	880	737	4,802
58	-	3,036	207	606	730	4,579
59	2,287	3,182	211	513	685	6,878
60	1,989	2,630	191	342	604	5,756
61	1,971	2,060	120	200	464	4,815
62	1,575	1,644	87	157	362	3,825
63	1,181	1,252	68	112	281	2,894
64	894	917	52	85	224	2,172
65	610	588	32	45	152	1,427
66	393	340	18	26	88	865
67	235	205	8	17	68	533
68	134	127	2	12	33	308
69	98	92	1	9	31	231
70+	155	134	7	17	104	417
Total	11,522	29,163	2,818	6,955	5,172	55,630

* Active member service rounded to nearest year on June 30 prior to retirement
** Age rounded to nearest year on June 30 prior to retirement

Table 3 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

REGULAR SERVICE RETIREMENTS
RATIO OF ACTUAL TO EXPECTED SERVICE RETIREMENTS DURING THE STUDY
WITH AN ANNUITY OR A SINGLE-SUM BENEFIT

MALES AND FEMALES

Ratio of Actual to Expected Number of Retirements						
	Service*					
Age**	5-18	19-30	31	32-33	34+	Total
54	-	87%	42%	59%	150%	66%
55	-	96%	39%	102%	165%	96%
56	-	92%	46%	102%	145%	104%
57	-	98%	80%	108%	145%	115%
58	-	101%	86%	111%	132%	114%
59	78%	106%	114%	135%	131%	108%
60	118%	110%	107%	142%	134%	118%
61	102%	111%	111%	103%	122%	109%
62	113%	104%	144%	98%	121%	110%
63	105%	108%	106%	109%	122%	109%
64	119%	113%	166%	141%	128%	120%
65	119%	113%	118%	119%	134%	118%
66	115%	114%	74%	68%	114%	111%
67	102%	120%	139%	65%	214%	124%
68	100%	103%	111%	37%	147%	103%
69	98%	105%	222%	99%	125%	106%
70+	33%	45%	29%	53%	33%	37%
Total	100%	104%	83%	103%	128%	105%

* Active member service rounded to nearest year on June 30 prior to retirement
** Age rounded to nearest year on June 30 prior to retirement

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study.

Table 3 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

REGULAR SERVICE RETIREMENTS
ACTUAL RATES OF SERVICE RETIREMENT DURING THE STUDY
WITH AN ANNUITY OR A SINGLE-SUM BENEFIT

MALES AND FEMALES

Actual Number of Retirements per 100 Eligible Active Members						
	Service*					
Age**	5-18	19-30	31	32-33	34+	Total
54	-	5	5	22	60	8
55	-	10	8	39	66	19
56	-	6	7	39	46	19
57	-	7	13	41	46	20
58	-	7	11	42	42	17
59	11	26	39	61	41	26
60	17	30	48	64	42	29
61	14	27	33	47	38	24
62	16	27	52	44	38	25
63	15	28	38	49	38	25
64	24	37	60	64	40	34
65	27	37	53	53	41	34
66	26	38	33	31	35	32
67	23	40	63	29	66	36
68	27	34	50	17	45	31
69	23	35	100	44	39	31
70+	33	45	29	53	33	37
Total	17	17	18	41	42	22

* Active member service rounded to nearest year on June 30 prior to retirement
** Age rounded to nearest year on June 30 prior to retirement

Table 4

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATH IN ACTIVE SERVICE

MALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	-	-	13	0%	-
23 - 27	-	2.0	6,444	0%	-
28 - 32	3	5.2	15,026	57%	0.02
33 - 37	5	6.4	16,579	78%	0.03
38 - 42	3	9.4	15,690	32%	0.02
43 - 47	4	10.8	12,959	37%	0.03
48 - 52	8	12.3	10,300	65%	0.08
53 - 57	17	15.5	8,862	109%	0.19
58 - 62	8	15.2	5,330	53%	0.15
63 - 67	6	7.7	1,572	78%	0.38
Over 67	2	1.3	253	153%	0.79
TOTAL	56	85.9	93,028	65%	0.06

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study.

Table 4 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATH IN ACTIVE SERVICE

FEMALES

Age	Number of Separations		Number Exposed	Ratio of Actual to Expected	Separations per 100 Participants
	Actual	Expected			
Less than 23	-	0.0	61	0%	-
23 - 27	2	3.0	26,336	67%	0.01
28 - 32	11	6.8	51,567	162%	0.02
33 - 37	8	9.9	47,538	81%	0.02
38 - 42	6	12.6	41,747	47%	0.01
43 - 47	12	16.0	36,878	75%	0.03
48 - 52	20	23.8	34,384	84%	0.06
53 - 57	36	41.7	35,977	86%	0.10
58 - 62	24	52.1	24,895	46%	0.10
63 - 67	9	21.5	6,468	42%	0.14
Over 67	2	1.6	715	129%	0.28
TOTAL	130	189.0	306,566	69%	0.04

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

The ratio of actual to exposed provides the actual rates of separation that occurred during the study.

Table 5

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATHS AMONG SERVICE RETIREMENTS

MALES

Age	Number of Deaths		Exposed	Ratio of Actual to Expected Experience
	Actual	Expected		
48 - 52	-	-	2	0%
53 - 57	6	4.2	1,605	143%
58 - 62	60	51.5	12,378	117%
63 - 67	184	192.2	25,307	96%
68 - 72	260	276.2	20,267	94%
73 - 77	304	316.9	13,514	96%
78 - 82	437	422.5	9,936	103%
83 - 87	486	476.7	6,204	102%
88 - 92	328	310.2	2,372	106%
93 - 97	129	114.0	539	113%
Over 97	36	30.3	102	119%
Total	2,230	2,194.7	92,226	102%

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

Table 5 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATHS AMONG SERVICE RETIREMENTS

FEMALES

Age	Number of Deaths		Exposed	Ratio of Actual to Expected Experience
	Actual	Expected		
48 - 52	-	-	-	0%
53 - 57	12	11.5	3,886	104%
58 - 62	99	170.3	34,987	58%
63 - 67	261	299.4	55,489	87%
68 - 72	311	346.4	37,321	90%
73 - 77	330	348.4	22,462	95%
78 - 82	472	497.1	15,330	95%
83 - 87	677	645.6	11,604	105%
88 - 92	779	856.2	7,075	91%
93 - 97	552	550.9	3,066	100%
Over 97	288	222.9	937	129%
Total	3,781	3,948.7	192,157	96%

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

Table 6

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATHS AMONG BENEFICIARIES OF DECEASED PENSIONERS

MALES

Age	Number of Deaths		Exposed	Ratio of Actual to Expected Experience
	Actual	Expected		
Less than 18	-	-	-	0%
18 - 22	21	0.0	139	55950%
23 - 27	1	-	6	48346%
28 - 32	-	-	4	0%
33 - 37	1	0.0	11	13212%
38 - 42	4	0.1	49	8590%
43 - 47	6	0.1	50	9743%
48 - 52	4	0.2	88	2583%
53 - 57	8	0.8	282	1032%
58 - 62	13	3.0	560	438%
63 - 67	13	10.6	1,074	123%
68 - 72	27	21.7	1,256	125%
73 - 77	47	37.5	1,280	125%
78 - 82	80	81.2	1,535	99%
83 - 87	133	134.5	1,448	99%
88 - 92	193	184.3	1,186	105%
93 - 97	121	118.7	502	102%
Over 97	30	29.3	93	103%
Total	702	621.7	9,563	113%

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

Table 6 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATHS AMONG BENEFICIARIES OF DECEASED PENSIONERS

FEMALES

Age	Number of Deaths		Exposed	Ratio of Actual to Expected Experience
	Actual	Expected		
Less than 18	-	-	-	0%
18 - 22	13	0.0	77	106237%
23 - 27	-	-	11	0%
28 - 32	1	-	3	143705%
33 - 37	6	0.0	24	63763%
38 - 42	5	0.0	31	29642%
43 - 47	10	0.0	43	26333%
48 - 52	13	0.2	122	7825%
53 - 57	18	0.7	282	2729%
58 - 62	33	3.7	824	893%
63 - 67	21	14.4	1,708	146%
68 - 72	27	34.4	2,388	78%
73 - 77	70	70.4	2,953	100%
78 - 82	105	136.3	3,463	77%
83 - 87	251	228.2	3,513	110%
88 - 92	247	256.8	2,269	96%
93 - 97	213	180.6	1,048	118%
Over 97	75	54.0	236	139%
Total	1,108	979.7	18,995	113%

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

Table 7

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATHS AMONG DISABILITY RETIREMENTS

MALES

Age	Number of Deaths		Exposed	Ratio of Actual to Expected Experience
	Actual	Expected		
23 - 27	-	-	-	0%
28 - 32	-	-	-	0%
33 - 37	2	0.0	2	4635%
38 - 42	1	0.3	15	313%
43 - 47	4	0.6	30	655%
48 - 52	7	1.6	71	427%
53 - 57	15	3.0	107	504%
58 - 62	11	4.7	138	235%
63 - 67	4	3.8	93	105%
68 - 72	-	2.9	59	0%
73 - 77	1	1.6	24	62%
78 - 82	2	1.9	22	106%
83 - 87	1	1.9	16	54%
88 - 92	-	0.1	1	0%
93 - 97	-	-	-	0%
Over 97	-	-	-	-
Total	48	22.5	578	213%

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

Table 7 (continued)

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

DEATHS AMONG DISABILITY RETIREMENTS

FEMALES

Age	Number of Deaths		Exposed	Ratio of Actual to Expected Experience
	Actual	Expected		
23 - 27	-	-	-	0%
28 - 32	21	0.3	39	8357%
33 - 37	21	0.5	74	4405%
38 - 42	27	0.8	123	3407%
43 - 47	32	1.4	209	2276%
48 - 52	32	2.3	223	1418%
53 - 57	50	7.9	506	630%
58 - 62	47	14.6	696	323%
63 - 67	20	10.9	410	184%
68 - 72	8	6.5	183	123%
73 - 77	5	6.3	128	80%
78 - 82	6	6.7	101	89%
83 - 87	8	4.2	45	189%
88 - 92	4	4.5	34	90%
93 - 97	1	1.6	8	65%
Over 97	-	0.2	1	0%
Total	282	68.5	2,780	412%

If the ratio of actual to expected is:
in excess of 100%, then the actual number of cases was greater than expected
less than 100%, then the actual number of cases was less than expected

Table 8

SUMMARY OF UTILIZATION OF ERO
FY 2012 - FY 2014

UTILIZATION OF ERO AMONG ALL ACTIVE SERVICE RETIREES

MALES AND FEMALES

ERO-ELIGIBLE SERVICE RETIREMENTS**

Number of Actual Service Retirements among Active Members						
	Age Rounded to Nearest Year on June 30 prior to Retirement					
Service *	54	55	56	57	58	59
19 – 30	-	160	309	184	184	185
31	-	26	35	16	26	22
32	2	28	48	25	32	29
33	-	195	267	160	144	98
34	-	23	380	377	253	168

ERO-ELECTED SERVICE RETIREMENTS**

Number of ERO Elected Service Retirements among Active Members						
	Age Rounded to Nearest Year on June 30 prior to Retirement					
Service *	54	55	56	57	58	59
19 – 30	-	80	178	90	106	95
31	-	17	23	7	13	14
32	-	23	25	13	12	15
33	-	20	30	19	9	8
34	-	1	8	9	2	6

UTILIZATION OF ERO AMONG ERO-ELIGIBLE SERVICE RETIREMENTS**

Rates of Utilization of ERO						
	Age Rounded to Nearest Year on June 30 prior to Retirement					
Service *	54	55	56	57	58	59
19 – 30	0%	50%	58%	49%	58%	51%
31	0%	65%	66%	44%	50%	64%
32	0%	82%	52%	52%	38%	52%
33	0%	10%	11%	12%	6%	8%
34	0%	4%	2%	2%	1%	4%

* Active member service rounded to nearest year on June 30 prior to retirement
** Based on beginning of year data and actuarial assumptions about service accruals and service purchases, projected to be eligible for ERO during the fiscal year of retirement

Total Number of ERO-Eligible Retirements: 3,376

- 24.4% of the ERO-Eligible (823) actually retired on ERO

ERO PROJECTION OF COST SHARING – Beginning July 1, 2016

Assumed Interest Rate	7.50%
Portion of ERO Cost by Source	
Member Lump Sum (14.40% rate)	19.6%
School District Lump Sum (29.30% rate)	39.8%
0.4% ERO contributions and Earnings	44.3%
Total	103.7%

Table 9

SUMMARY OF OPTIONAL AND SICK LEAVE SERVICE CREDIT
FY 2012 - FY 2014

OPTIONAL AND SICK LEAVE SERVICE CREDIT
AMONG ACTIVE SERVICE RETIREES
WHO RETIRED WITH AN ANNUITY

MALES AND FEMALES

SERVICE CREDIT AT RETIREMENT

Type of Service	Number of Retirees	Years of Service	Average Over All Retirees	As a Percent of Regular
Regular	14,605	350,586	24.005	100.00%
Optional Service	3,432	8,922	0.611	2.54%
Sick Leave	13,047	14,761	1.011	4.21%
Total	14,605	374,269	25.626	106.76%

AVERAGE AMOUNTS OF DIFFERENT TYPES OF SERVICE

Type of Service	Under 20	20-24.999	25-29.999	30-33.999	34 or more	Total
Regular	10.457	20.933	25.248	29.330	34.410	24.005
Optional Service	0.204	0.537	1.029	1.424	0.520	0.611
Sick Leave	0.367	0.938	1.115	1.276	1.449	1.011
Total	11.029	22.408	27.391	32.030	36.380	25.626

AVERAGES BY FISCAL YEAR OF RETIREMENT

Fiscal Year	Optional Service	Sick Leave	Total
2012	0.678	1.064	1.742
2013	0.598	1.002	1.600
2014	0.560	0.968	1.529
Average	0.611	1.011	1.622

Table 10

SUMMARY OF EXPERIENCE
FY 2012 - FY 2014

SALARY INCREASES OF ACTIVE MEMBERS
(without the .25% allowance for employment type and status changes)

FULL TIME / PART TIME MEMBERS AT THE BEGINNING AND END OF THE YEAR

MALES AND FEMALES

Central Age Group	Salaries At End Of Year ($ in Thousands)			Increases In Salaries	
	Actual Current (A)	Expected Current (B)	Actual Prior (C)	Actual (A) / (C) - 1	Expected (B) / (C) - 1
20	$ 2,821	$ 2,641	$ 2,402	17.44%	9.95%
25	1,523,299	1,537,477	1,411,915	7.89%	8.89%
30	3,743,858	3,823,783	3,561,399	5.12%	7.37%
35	4,250,471	4,338,733	4,072,352	4.37%	6.54%
40	4,259,204	4,345,479	4,096,382	3.97%	6.08%
45	3,908,246	3,995,312	3,783,392	3.30%	5.60%
50	3,587,079	3,664,860	3,493,325	2.68%	4.91%
55	3,453,298	3,505,190	3,345,046	3.24%	4.79%
60	2,044,460	2,068,231	1,973,738	3.58%	4.79%
65	492,993	499,149	476,344	3.50%	4.79%
70	49,748	50,725	48,407	2.77%	4.79%
Total	$ 27,315,477	$ 27,831,580	$ 26,264,702	4.00%	5.97%