TOWN OF JOHNSTON, RHODE ISLAND POLICE AND FIREFIGHTER PENSION SYSTEMS

Actuarial Experience Review

July 1, 2011 to June 30, 2014

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April 1, 2015

Board of Trustees
Town of Johnston, Rhode Island
Police and Firefighters Pension Systems
Johnston, Rhode Island

Dear Board Members:

We are pleased to present this report on our actuarial experience investigation of the Police and Firefighters Pension Systems covering the period from July 1, 2011 to June 30, 2014.

Based on our analysis of the plan's actuarial experience for the period, we offer for the Board's consideration a change in the retirement assumption for Police Officers. For all other assumptions and methods, we recommend maintaining the current ones. We encourage the Board's comments and input on this study as we consider modifications to the actuarial assumptions and methods used to value the plan.

This study was performed under the supervision of Ms. Jeanette R. Cooper with the assistance of Mr. Malichi Waterman and Ms. Jody Martin.

To the best of our knowledge, this report is complete and accurate and the calculations were performed in accordance with generally accepted actuarial principles and practices. The supervising actuary is a member of the Society of Actuaries, the American Academy of Actuaries, and other professional actuarial organizations and collectively meets their "General Qualification Standards for Prescribed Statements of Actuarial Opinions" to render the actuarial opinion contained herein.

Sincerely,

William Connolly rch

William Connolly, FCA, MAAA, EA
Consulting Actuary

Jeanette R. Cooper

Jeanette R. Cooper, FSA, FCA, MAAA, EA
Vice President and Actuary

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I. Executive Summary

A. Introduction

The annual actuarial valuations for the Town of Johnston, Rhode Island Police and Firefighters Pension Systems ("Plans") provide projections of future benefit payments for all current participants based upon actuarial assumptions adopted by the Board that are discounted to the valuation date. The actuarial valuation methods are tools that develop long-term budget patterns to assure necessary contributions are systematically deposited in the Plan so that funds are available to pay promised benefits as they come due. The methods and assumptions must comply with generally accepted actuarial principles and practices, GASB accounting standards and state law.

The assumptions and methods used in the annual actuarial valuations are adopted by the Board of Trustees, based on recommendations of the actuary and the findings of actuarial experience studies. Pursuant to current legislation for the state of Rhode Island, an actuarial experience study should be prepared at least every three years. The purpose of the study is to modify current assumptions to reflect emerging experience as well as expected experience in future years.

In reviewing this report, note that both Plans have been closed to new hires. The Firefighters System was closed to employees hired on or after July 1, 1999. The Police System was closed to new employees hired on or after July 1, 2010.

The experience study includes a complete review of all assumptions and methods used in the valuation. The assumptions can be broken down into two categories: economic and demographic assumptions. Economic assumptions include inflation, investment rate of return (or discount rate), payroll growth rates, salary scale, cost-of-living adjustments (COLAs), and administrative expenses. Demographic assumptions include mortality, turnover (or withdrawal), retirement, disability, percent married, and spousal age difference.

The methods studied include the base actuarial cost method for determining allocation of liabilities to past and future years, the asset smoothing method, and the amortization of unfunded liability.

Following the Executive Summary are additional sections which include detailed analysis, address specific issues and provide recommendations. The sections are:

➤ Economic assumptions;

➤ Demographic assumptions; and

➤ Actuarial methods.

Appendices at the end of the report detail all of the proposed decrement rates. A summary of the key points of our review and our recommendations follows.

B. Findings and Recommendations

At the direction of the Board of Trustees ("Board"), we have performed a review of the Police and Firefighters Pension Systems experience. As mentioned earlier, both Plans have been closed to new hires.

The experience review affords an opportunity for the Board, staff and actuary to consider how specific assumptions or methods may be affecting contribution rates and the proper funding of the Plans. We have reviewed both the economic and demographic experience of the Plans as it relates to the expected actuarial experience based on the current plan assumptions. Included are recommendations for changes in assumptions and methods that we believe will more accurately reflect the future experience of the Plans and will help to stabilize annual cost requirements from year to year.

The detailed analysis of each individual assumption is discussed later in this report.

Economic Assumptions

Economic assumptions include inflation, investment rate of return (or discount rate), payroll growth rates, salary scale, administrative expenses, and COLAs.

Inflation

Inflation continues at relatively low levels from a historical perspective, as shown in the graph below.
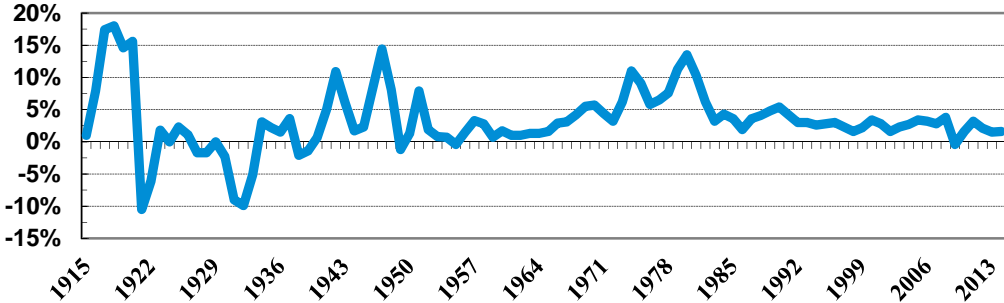
There is an explicit assumption for inflation in the actuarial valuation of 2.75%. The future outlook for inflation remains relatively low despite the volatile nature of energy and commodities prices. Taking into account recent experience as well as the future outlook, we recommend maintaining the current implicit assumed inflation rate of 2.75%.

We utilized the "building block" approach to develop economic assumptions. Under the "building block" approach, inflation is the basis for all economic assumptions. The investment return assumption is comprised of inflation and the expected risk premium for each asset class. The underlying salary scale assumption is composed of inflation, productivity increases, and merit increases. Finally, payroll growth is a function of the inflation and productivity components of salary scale.

Economic Assumptions (*continued*)

Investment Return

The Plan has averaged and 8.19% market investment return rate over the last three years on a geometric basis for the combined Pension System. Over the last five years on a market value weighted basis, the return rates were 10.71% and 11.84% for Police and Firefighters, respectively. This compares to the assumption of 7.50%. Thus, on average, the plan has outperformed the assumption significantly over the last five years for both Plans.

The current 7.50% investment return assumption is not out of line with other public plans as reported by the recent National Association of State Retirement Administrators (NASRA) study shown below.
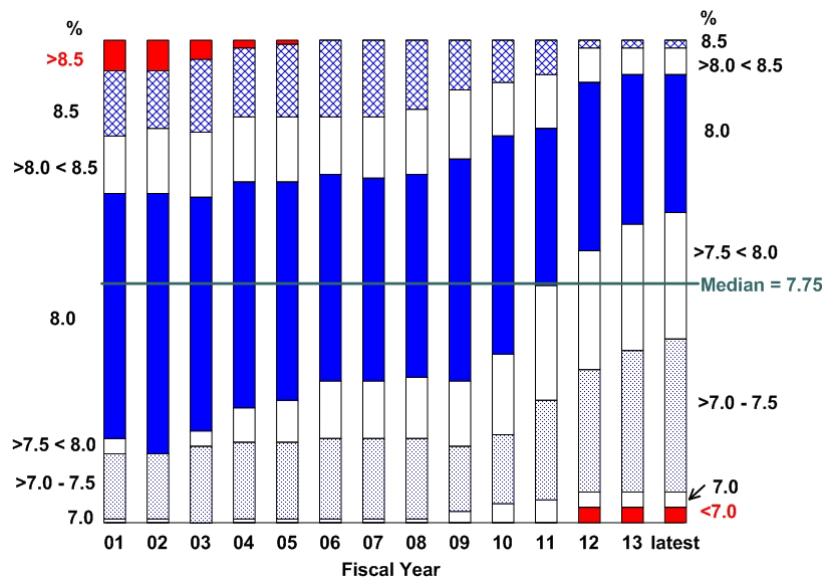
Given the Plan's recent investment performance, target asset allocation and taking into account the short-to-mid-term outlook for stocks and bonds, we recommend maintaining the current investment return assumption of 7.50%. Note that this assumption is net of investment expenses. As the current actives retire and the cash flow needs of the Plans increase, we will need to consider possible further decreases in the investment return assumption. This assumption is discussed in more detail in *Section II, subsection B.*

Payroll Growth Rate

Half of the payroll growth rate assumption is used as the basis for the annual retiree cost-of-living assumption (COLA). We are not recommending any changes to the payroll growth rate of 3.25% at this time. The 3.25% rate is composed of the assumed 2.75% inflation rate plus assumed productivity increases of 0.50%.

Economic Assumptions (*continued*)

Salary Scale

The current salary increase assumption is a flat 4.00% annual increase regardless of age or years of service. Many plans have salary scales based on age and/or service since more rapid career progression (and highest percentage increases in salary) often occurs within the first few years of employment. We have not found this to be the case in the Johnston Police and Firefighters Plans.

Since both Plans are only available to existing hires, the general increase rate in the most recent contracts is fixed, and the increases are not correlated with age, we have decided to maintain the flat increase rate. We also recognized the new contract rates and the long-term nature of the actuarial assumptions. The 4.00% increase is comprised of a 2.75% inflation increase, a 0.50% productivity increase, and a 0.75% promotional and longevity increase.

In addition to the salary increase assumption, the Firefighters Plan includes an assumption on severance pay where the severance pay is estimated as 50% of base pay at retirement. This increases the final average salary which includes overtime and other portions of total pay by 12.5%.

A similar type of assumption does not exist in the Police Plan valuation. The Police Plan benefit provisions differ in that instead of automatically increasing final year pay by severance pay, unused sick time can be counted toward additional service credits up to 240 days or as a cash reimbursement which could increase the final year pay.

We do not recommend any changes to these assumptions.

Administrative Expenses

Effective with the July 1, 2014 valuation, an explicit administrative assumption was introduced. When administrative expenses are paid from the pension plan trusts, it is typical for plans to include an assumption for administrative expenses as part of the Normal Cost. Prior to July 1, 2014, the administrative expenses were not provided separately for the Firefighters Plan and the Police Plan's asset reconciliation. However, for the year ending June 30, 2014 these expenses totaled $254,635 for both plans. A flat dollar assumption of $75,000 payable at the beginning of each year was introduced for each plan.

The investment return assumption of 7.50% is assumed to be net of investment expenses. If the amount of administrative expenses paid from plan assets is shown to stay closer to $250,000, we would increase this assumption with the 2015 valuation.

Economic Assumptions (*continued*)

Cost-of-Living Adjustments

Retirees in the Firefighters Plan receive an annual COLA equal to one-half of the negotiated base pay increase for active firefighters. Based on the current 3.25% assumed payroll growth, the COLA assumption for the Firefighters valuation is 1.625%. Police Plan participants who retired prior to July 1, 2005 have this same provision while participants who retired after June 30, 2005 receive 3.00% increases compounded each year. The Police valuation uses a 1.625% assumed increase rate for participants who retired prior to July 1, 2005 and 3.00% otherwise.

Since there was no change in the payroll growth assumption, we are not recommending a change to the COLA assumption.

Demographic Assumptions

Demographic assumptions include mortality, turnover (or withdrawal), retirement, disability, percent married, and spousal age difference. A summary of our findings for each of the assumptions is discussed on the next few pages.

Mortality

Due to the small numbers of participants in both Plans, the healthy and disabled experience is generally not considered credible. It is our understanding that the State of Rhode Island will deem the mortality assumptions reasonable if they match the assumptions used for the State of Rhode Island Municipal Employees Retirement System (MERS).

The MERS assumptions that were used for MERS at the time of the last Johnston experience study and are still in place for the MERS 2014 valuation are as follows:

Healthy Mortality for Males: 115% of the RP-2000 Combined Healthy Mortality Table for Males with White Collar adjustments, projected with Scale AA from 2000

Healthy Mortality for Females: 95% of the RP-2000 Combined Healthy Mortality Table for Females with White Collar adjustments, projected with Scale AA from 2000

Disabled Mortality for Males: 60% of PBGC Table V(a) for disabled males eligible for Social Security disability benefits

Disabled Mortality for Females: 60% of PBGC Table VI(a) for disabled females eligible for Social Security disability benefits

These tables have been used for the Johnston Police and Firefighters Pension System since 2012. Therefore we are not recommending any changes to the healthy and disabled mortality assumptions.

Demographic Assumptions (*continued*)

Turnover (Withdrawal)

Currently, no participants in either Plan are assumed to withdraw. During the three-year study period, one police officer and no firefighters withdrew from the force. Since no new hires will be eligible for either Plan, we recommend continuing the current assumption of no withdrawals.

Retirement

The current retirement rates are based on service and reflect that unreduced benefits are available to police officers at any age upon completing 18 years of service and are available to firefighters at any age upon completing 20 years of service. These rates were last updated with the July 1, 2012 valuation.

In general, the retirement rates in the Firefighters Plan were close to expected and the actual number of retirements was only one less than expected. We are recommending maintaining the current rates for all years of service.

The experience for the Police Plan had almost 50% more retirements than expected. Based on this experience, we are proposing increasing the retirement rates, currently at 15% for 18 to 23 years of service, to 25% for 18 to 20 years of service, 35% for 21 to 22 years of service, and 50% for 23 years of service.

See Section III, subsection C for detailed analysis and Appendix A for the proposed retirement table for the Police Plan.

Demographic Assumptions (*continued*)

Disability

During the study period, two police officers and one firefighter were reported as disabled with the overall actual disability rates among police officers somewhat higher than for firefighters. Currently the assumption is based on a table of unisex rates. Based on the small number of disabilities, we are recommending no changes to the rates in either Plan.

Other Demographic Assumptions

Other demographic assumptions that generally impact the valuation are the percent married and the spousal age difference.

The current assumption is that 85% of participants are married and female spouses are assumed three years younger than male spouses. As was true at the time of the prior study, we were not supplied spousal information for active or retired participants. Therefore, we were not able to analyze this experience. In light of that we looked at the recommended assumption for the MERS plan. The July 1, 2014 MERS valuation included an 80% married assumption with female spouses assumed to be three years younger than male spouses. Since this is a closed Plan with older participants relative to MERS, we recommend maintaining the current marriage assumptions.

Methods

Actuarial methods include the asset valuation method, actuarial cost method and amortization method of the unfunded actuarial accrued liability (UAAL).

Asset Valuation Method

The current asset valuation method sets the actuarial value of assets equal to market value. Using this method results in more volatile returns from year to year than if investment gains and losses were smoothed. When a plan is ongoing with new entrants coming into the plan each year, a smoothed method is typically used. A common smoothing method is to recognize each year's investment gain or loss on a straight-line basis over a period of three to five years with the resulting value constrained to be within a 10% to 20% corridor around market value. For plans where participation is frozen, this type of smoothing method is still often used. However, it is not uncommon to use market value when most of the participants are no longer accruing benefits.

Since both plans have been frozen to new entrants, we are not recommending a change in the asset method.

Actuarial Cost Method

The actuarial cost method is a mechanism to orderly fund benefits over a participant's lifetime. The actuarial cost method allocates liability for service already accrued (i.e. Actuarial Accrued Liability) and future service (i.e. Normal Cost). The current actuarial cost method is the "replacement life" Entry Age Normal actuarial cost method, which recognizes that every member that retires is likely to be *replaced* by a new member. Under this method, a normal cost is calculated for each employee which is the level annual contribution as a percent of pay required to be made from the employee's date of hire for as long as they remain active so that sufficient assets will be accumulated to provide their benefit. The normal cost reflects current plan changes while the accrued liability is a balancing item.

As most of the System's liabilities are attributable to non-active participants, the normal cost has minimal impact on plan cost. We are therefore not recommending any changes to the cost method.

Amortization Method

The unfunded actuarial accrued liability (UAAL) is amortized on a level dollar basis over a closed 24-year period commencing on July 1, 2012. There are 22 years remaining on this period as of July 1, 2014.

We recommend continuation of the level dollar method, that the period remain closed, and that the period not be reset.

Summary of Actuarial Experience

This section shows the plans actuarial gains and losses in the two valuations since the assumptions were revised based on the last experience review. Each valuation's gain or loss is further divided into the investment and non-investment gain or loss. As shown in the chart, both the Police and Firefighters Plans experienced a non-investment gain in the 2013 valuation and a non-investment loss in the 2014 valuation.

POLICE

Valuation Date	Actuarial Accrued Liability (AAL)	Total Actuarial (Loss)/Gain		Investment (Loss)/Gain		Non-Investment (Loss)/Gain*	
		Amount (in $)	% of AAL	Amount (in $)	% of AAL	Amount (in $)	% of AAL
June 2013	$69,418,753	$4,277,245	6.2%	$482,944	0.7%	$3,794,301	5.5%
June 2014	76,246,263	-2,874,096	-3.8%	1,151,852	1.5%	-4,025,948	-5.3%

POLICE - GAINS/(LOSSES) AS A PERCENT OF AAL
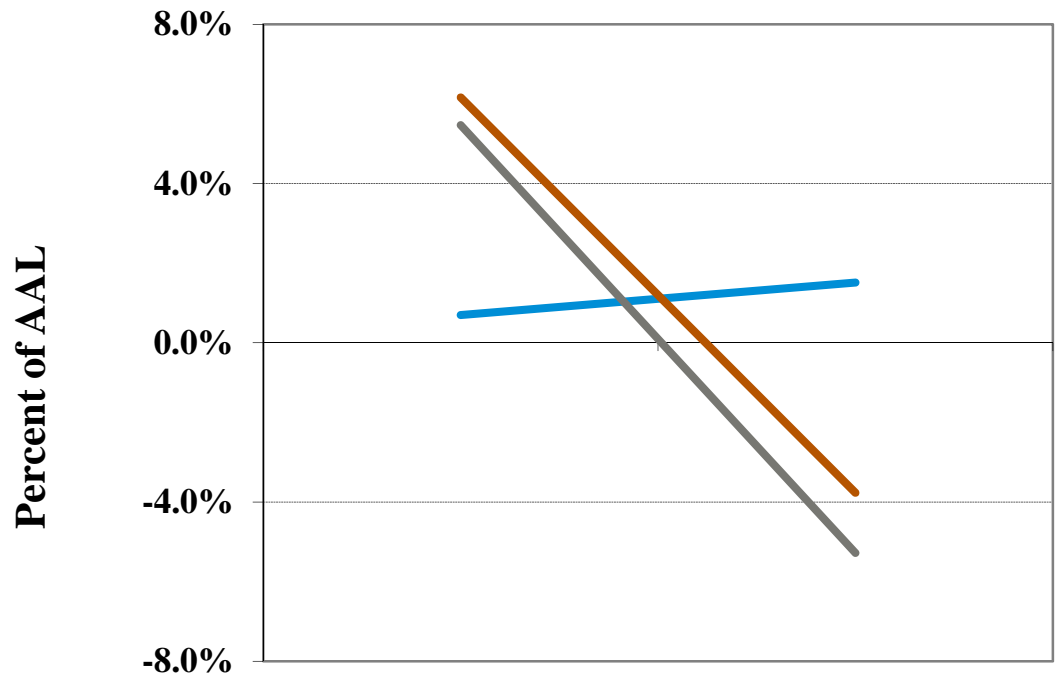
	Jun-13	Jun-14
Investment Gain/(Loss)	0.7%	1.5%
Non-Investment Gain/(Loss)	5.5%	-5.3%
Total	6.2%	-3.8%

FIREFIGHTERS

Valuation Date	Actuarial Accrued Liability (AAL)	Total Actuarial (Loss)/Gain		Investment (Loss)/Gain		Non-Investment (Loss)/Gain*	
		Amount (in $)	% of AAL	Amount (in $)	% of AAL	Amount (in $)	% of AAL
June 2013	$78,316,245	$2,910,421	3.7%	$668,536	0.8%	$2,241,885	2.9%
June 2014	82,359,411	311,756	0.4%	1,615,690	2.0%	-1,303,934	-1.6%

FIREFIGHTERS - GAINS/(LOSSES) AS A PERCENT OF AAL
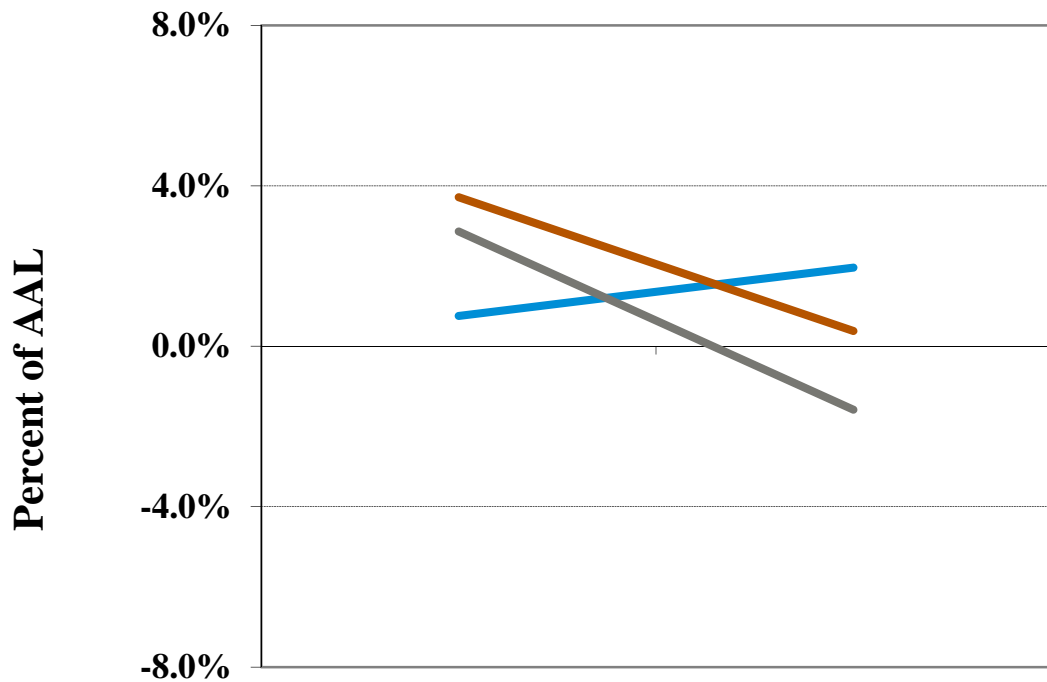
	Jun-13	Jun-14
Investment Gain/(Loss)	0.8%	2.0%
Non-Investment Gain/(Loss)	2.9%	-1.6%
Total	3.7%	0.4%

C. Impact of Assumption Changes on Valuation Results

To illustrate the impact of the proposed change to the Police retirement assumption, the following table shows the July 1, 2014 valuation results for the Police and Firefighters Plans and for both Plans combined if the proposed change were adopted as of July 1, 2014.

Column's A, C and D show the 2014 valuation results using the current assumptions. *Column's B and E* show the impact of the recommended assumption change.

Description	(A) POLICE July 1, 2014 Valuation Results (FY '16)	(B) POLICE Proposed Assumptions	(C) FIREFIGHTERS July 1, 2014 Valuation Results (FY '16)	(D) COMBINED PLAN July 1, 2014 Valuation Results (FY '16)	(E) COMBINED PLAN Proposed Assumptions
1. Actuarial Accrued Liability (AAL)	$76,200,000	$76,900,000	$82,400,000	$158,600,000	$159,300,000
2. Actuarial Value of Assets (AVA)	17,100,000	17,100,000	24,200,000	41,300,000	41,300,000
3. Unfunded Actuarial Accrued Liability (UAAL) [(1) - (2)]	$59,100,000	$59,800,000	$58,200,000	$117,300,000	$118,000,000
4. Funded Percentage [(2)/(1)]	22%	22%	29%	26%	26%
5. Employer Normal Cost	$1,300,000	$1,300,000	$800,000	$2,100,000	$2,100,000
6. Payment on UAAL	5,200,000	5,200,000	5,100,000	10,300,000	10,300,000
7. Total Recommended Contribution adjusted for Timing [(5) + (6) + Interest]	$7,200,000	$7,300,000	$6,600,000	$13,800,000	$13,900,000
8. Recommended Contribution as a Percentage of Projected Payroll	148%	150%	205%	170%	172%

Police Plan

The net impact of the recommended assumption change increases the unfunded actuarial accrued liability (UAAL) by approximately $0.7 million and increases the recommended contribution by approximately $0.1 million, or 2% of projected payroll (*Column B - Column A*).

Firefighters Plan

Since we are recommending no change in the current assumptions for this plan, there is no impact to report for the Firefighters Plan. The numbers reflected in *Column C* are based on the July 1, 2014 valuation report.

Combined Plans

As requested, we also looked at the net impact on the combined plans.

The net impact of the recommended assumption change increases the unfunded actuarial accrued liability (UAAL) by approximately $0.7 million and increases the recommended contribution by approximately $0.1 million, or 2% of projected payroll (*Column E - Column D*).

II. Economic Assumptions

The economic assumptions have a significant impact on the development of plan liabilities. Changes to these assumptions can substantially alter the results determined by the actuary. The goal of an experience study is to produce a consistent set of economic assumptions that appropriately reflect expected future economic trends.

The primary economic assumptions that affect the Plan's funding are:

> Inflation;

> Investment Rate of Return (or Discount Rate);

> Payroll Growth Rate;

> Salary Scale (Merit Increases);

> Administrative Expenses; and

> COLAs

The Actuarial Standards Board (ASB) has adopted Actuarial Standard of Practice No. 27 (ASOP 27 - Selection of Economic Assumptions for Measuring Pension Obligations) to provide actuaries guidance in developing economic assumptions. A key feature of the ASB's guidance is the "building block" approach in developing economic assumptions.

The "building block" approach uses the actuary's best estimate for key components of economic assumptions. The actuary begins with a reasonable range of each component, then selects a specific point within the range based on historical data, plan specific data and the future economic environment.

The inflation component is included in all economic assumptions, and therefore is key to developing a consistent set of actuarial assumptions. Under the "building block" approach, we consider the investment rate of return assumption as the combination of an inflation component and a real rate of return component. The components of the salary increase assumption are inflation, productivity, and merit increases which include promotional and longevity increases.

Since the Plans are frozen to new entrants, consideration must be given to the impact of future cash flow needs as the active census continues to decline.

A. Inflation

In developing the recommendation for the assumed inflation component, actuarial standards of practice suggest the actuary review appropriate inflation data. This data may include consumer price indexes, the implicit price deflator, forecasts of inflation, and yields on government securities of various maturities. For this study, we reviewed a commonly referenced historical measure of inflation, the Consumer Price Index for all urban consumers (CPI-U).

The graph below shows how recent inflation experience is below the longer-term average rate. The five-year average inflation rate is below 2.00% while the 25 and 30-year averages are slightly below 3.00%.

Average Inflation as of December 31, 2014
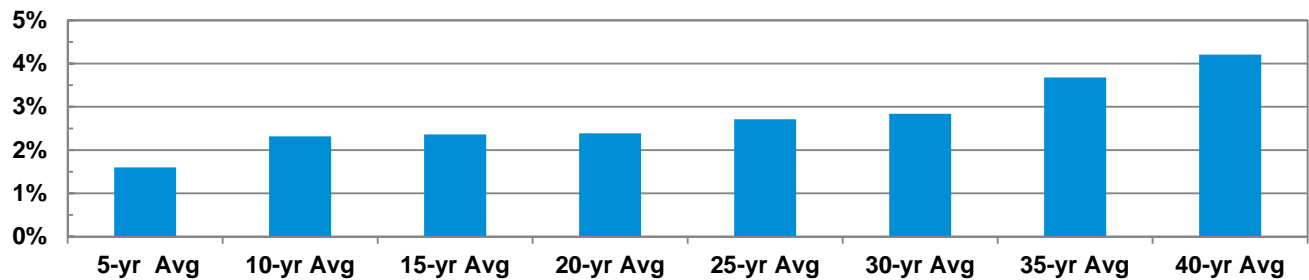
The average annual rate of increase in the CPI-U in the 2000s has been the lowest since the early 1960s. Inflation for 2014 was approximately 1.6%, which was lower than the 30-year average and higher than the previous year. Historical trend is an important consideration for the assumed rate of inflation, but is not the sole indicator in determining the reasonable bounds of expected inflation.

Considering recent trends in inflation, we have determined the current reasonable range to be between 2.50% and 3.50%.

As a check of the validity of this reasonable range, we reference the 2014 *Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds..* The range of inflation rates in this report was 2.0% to 3.4%.

Once the reasonable range is set, we determine the specific point in the range which is the best estimate of long-term future inflation rates. Given the reasonable range and the current environment, we recommend maintaining the 2.75% assumption.

B. Investment Rate of Return

The discount rate is used to determine the present value of expected future plan payments. Generally, the appropriate discount rate is the same as the investment return assumption. The current assumption is 7.50%, net of investment expenses, for both Plans.

The table below shows the market returns for the last ten years with five-year and ten-year averages.

Year Ended June 30	Police Market Value Investment Return	Firefighters Market Value Investment Return	Assumed Investment Return
2005	4.42%	7.49%	8.00%
2006	7.94	8.50	7.75
2007	10.01	14.35	7.75
2008	-1.79	-5.39	7.75
2009	-15.44	-18.41	7.75
2010	9.80	13.68	7.75
2011	19.68	22.16	7.75
2012	-0.55	-0.55	7.50
2013	10.71	10.71	7.50
2014	15.01	15.01	7.50
Five-Year Average	**10.71%**	**11.84%**	
Ten-Year Average	**5.62%**	**6.23%**	

Note: Market returns determined by the actuary may not match recorded market returns by the Plan since the values are calculated based upon an average value of market assets that include cash inflows and outflows.
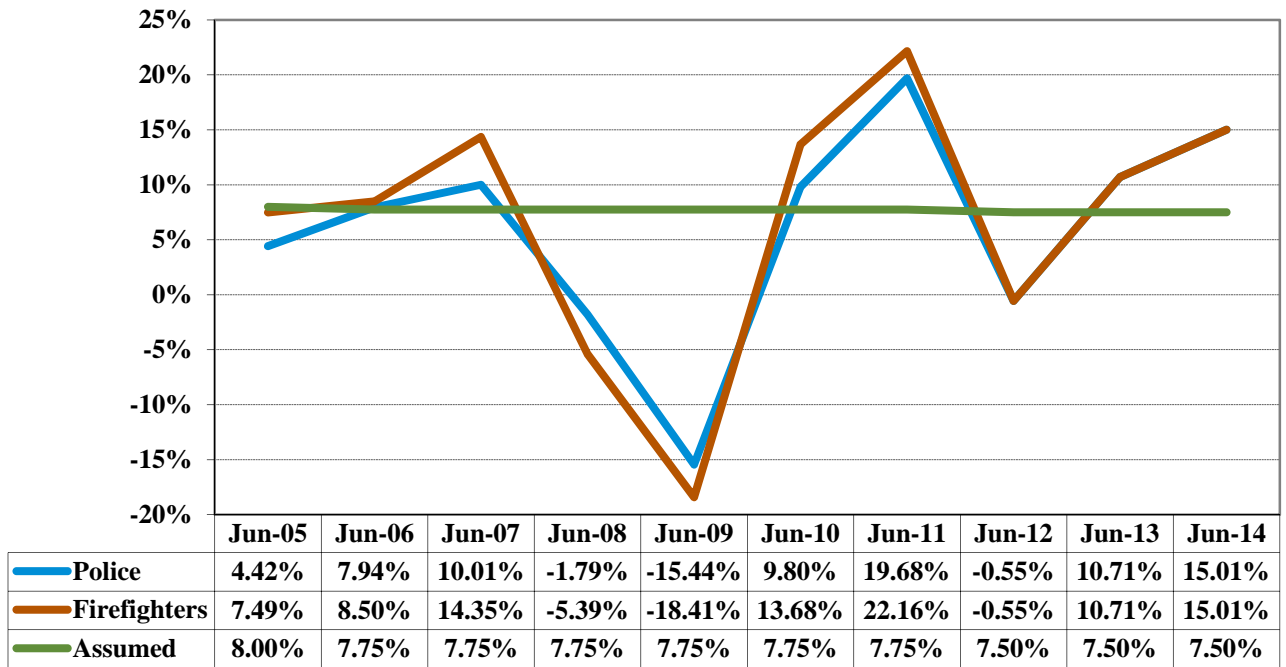
The investment rate of return assumption is developed using the "building block" approach as outlined in ASOP 27. Under this approach, the investment rate of return assumption is made up of two components; the inflation component and the real investment rate of return component. The reasonable range of the inflation component determined above is combined with the reasonable range of the real rate of return component. This reasonable range is then evaluated and refined. The final recommendation is a specific point in this best-estimate range.

In developing the reasonable range for the real rate of return, we consider future capital market assumptions for the Plans' major asset classes. Estimates of future capital market assumptions for the Funds' major asset classes are shown in the following table:

Asset Class	Assumed Future Real Rate Return	Target Asset Allocation
Domestic equities	6.3%	40.0%
International equities – developed markets	7.0%	17.5%
International equities – emerging markets	9.3%	2.5%
Fixed income – core	1.2%	28.0%
Fixed income – high yield	4.0%	6.0%
Real estate	5.0%	5.0%
Cash and cash equivalents	0.0%	1.0%

Based on the Plan's target investment allocation and the assumed future real return rates shown above, the real rate of return for the Plan is 4.76%. Combining the best-estimate real rate of return with the assumed rate of inflation of 2.75% yields an investment rate of return assumption of 7.51%, net of investment fees. Thus we recommend maintaining the 7.50% investment return assumption at this time.

Graphs 1A and 1B display the rates of return and the asset changes over the last ten years.

GRAPH 1A:
SUMMARY OF INVESTMENT RETURN
FOR THE PERIOD JUNE 30, 2005 THROUGH JUNE 30, 2014

	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14
Police	4.42%	7.94%	10.01%	-1.79%	-15.44%	9.80%	19.68%	-0.55%	10.71%	15.01%
Firefighters	7.49%	8.50%	14.35%	-5.39%	-18.41%	13.68%	22.16%	-0.55%	10.71%	15.01%
Assumed	8.00%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.50%	7.50%	7.50%

GRAPH 1B:
POLICE AND FIREFIGHTERS PLAN ASSETS
FOR THE PERIOD JUNE 30, 2005 THROUGH JUNE 30, 2014

	Jun-05	Jun-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11	Jun-12	Jun-13	Jun-14
Police	$11.46	$13.29	$15.52	$16.42	$14.20	$15.92	$18.11	$15.88	$15.82	$17.14
Firefighters	$13.55	$16.36	$20.66	$20.69	$17.47	$20.56	$23.70	$21.83	$22.05	$24.18

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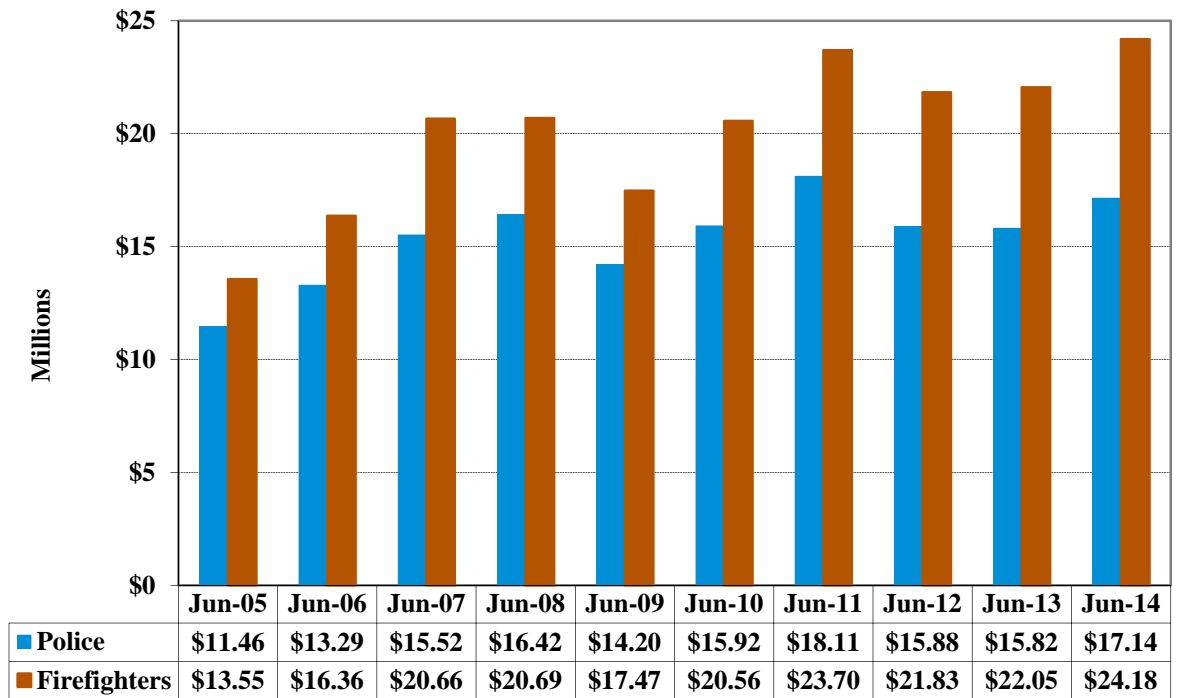
C. Payroll Growth

Payroll growth is used as the starting point for determining the COLA assumption. Currently the payroll growth assumption is 3.25% per year. Based on a long-term future productivity assumption of 0.50% coupled with the 2.75% inflation rate, we recommend no change in this assumption.

D. Salary Scale

The salary scale is used to determine participants' ultimate benefits in the Plan. Generally, a participant's salary will change over the long term in accordance with inflation, productivity growth and merit scale (promotional and longevity increases). The actuary should review available compensation data when selecting this assumption, including: Plan sponsor's current compensation practices and any anticipated changes; historical compensation increases and practices of the plan sponsor and other sponsors in the same industry or geographic area; and historical national wage and productivity increases.

The current salary increase assumption is a flat 4.00% annual increase regardless of age or years of service. Since more rapid career progression often occurs within the first few years of employment, the highest percentage increases in salary tend to happen in the first few years of service. The actual salary experience was examined by age. The experience did not show that participants at younger ages received higher salary increases. The current contracts call for minimal increases.

Since both Plans are only available to existing hires, the general increase rate in the most recent contracts is fixed, and there is no positive correlation between a participant's age and their salary increase, we have decided to maintain the flat increase rate. We also recognized the new contract rates and the long-term nature of the actuarial assumptions. Therefore, we propose maintaining the salary increase rate of 4.00%. The 4.00% increase is comprised of a 2.75% inflation increase, a 0.50% productivity increase, and a 0.75% promotional and longevity increase.

It should be noted that the experience analysis reveals significant variations from year to year. Table 2 displays the actual experience against the current assumption. Graphs 2A and 2B provide this information pictorially.

In addition to the salary increase assumption, the Firefighters Plan includes an assumption on severance pay where the severance pay is estimated as 50% of base pay at retirement. This increases the final average salary which includes overtime and other portions of total pay by 12.5%. A similar type of assumption does not exist in the Police Plan. The Police Plan benefit provisions differ in that instead of automatically increasing final year pay by severance pay, unused sick time can be counted toward additional service credits up to 240 days or as a cash reimbursement which could increase the final year pay. We are not recommending any changes to these assumptions.

TABLE 2:
SALARY SCALE EXPERIENCE
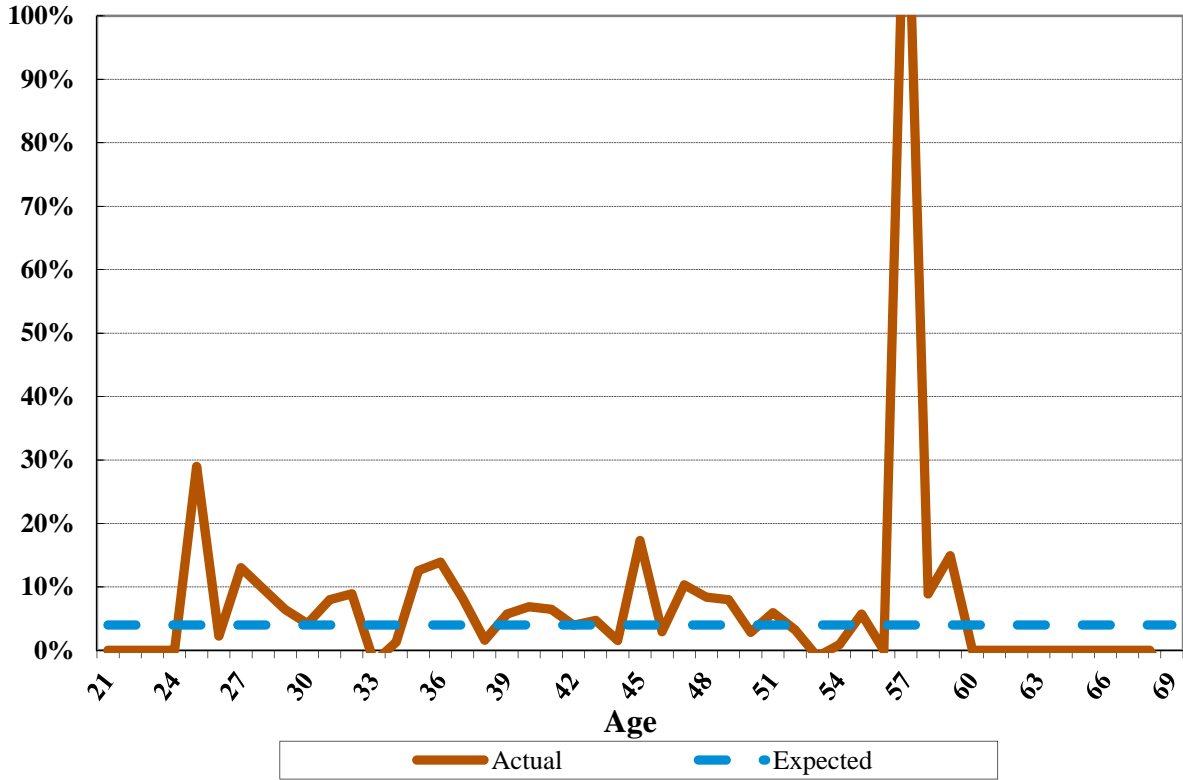## FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014

POLICE

Age	Total Exposures	Actual Salary Increase For the Year Ended June 30,			Study Period Actual	Study Period Expected
		2012	2013	2014		
Under 25	0	0.00%	0.00%	0.00%	0.00%	4.00%
25-29	17	15.37%	5.00%	7.93%	10.02%	4.00%
30-34	54	6.15%	1.44%	4.58%	4.03%	4.00%
35-39	21	6.83%	20.21%	2.56%	8.10%	4.00%
40-44	42	4.94%	4.26%	4.98%	4.72%	4.00%
45-49	31	5.55%	15.47%	8.25%	9.92%	4.00%
50-54	11	-0.38%	-1.21%	11.19%	2.53%	4.00%
55-59	4	131.65%	8.89%	10.64%	25.20%	4.00%
60-64	0	0.00%	0.00%	0.00%	0.00%	4.00%
65 &Over	3	-5.69%	14.24%	-14.50%	-2.61%	4.00%
TOTAL	**183**	**6.92%**	**6.72%**	**5.43%**	**6.39%**	**4.00%**

FIREFIGHTERS

Age	Total Exposures	Actual Salary Increase For the Year Ended June 30,			Study Period Actual	Study Period Expected
		2012	2013	2014		
Under 25	0	0.00%	0.00%	0.00%	0.00%	4.00%
25-29	0	0.00%	0.00%	0.00%	0.00%	4.00%
30-34	0	0.00%	0.00%	0.00%	0.00%	4.00%
35-39	4	10.30%	-5.95%	0.00%	1.78%	4.00%
40-44	48	11.37%	-3.81%	-1.94%	2.60%	4.00%
45-49	43	7.01%	1.34%	-0.20%	2.52%	4.00%
50-54	7	-3.51%	10.52%	6.79%	4.25%	4.00%
55-59	3	-6.10%	-4.52%	4.97%	-2.08%	4.00%
60-64	0	0.00%	0.00%	0.00%	0.00%	4.00%
65 &Over	0	0.00%	0.00%	0.00%	0.00%	4.00%
TOTAL	**105**	**8.29%**	**-1.14%**	**-0.02%**	**2.54%**	**4.00%**

GRAPH 2A:
SALARY SCALE - POLICE
FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014

GRAPH 2B:
SALARY SCALE - FIREFIGHTERS
FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014

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E. Administrative Expenses

Effective with the July 1, 2014 valuation, an explicit administrative assumption was introduced. When administrative expenses are paid from the pension plan trusts, it is typical for plans to include an assumption for administrative expenses as part of the Normal Cost. Prior to July 1, 2014, the administrative expenses were not provided separately for the Firefighters Plan and the Police Plan's asset reconciliation. However, for the year ending June 30, 2014 these expenses totaled $254,635 for both plans. A flat dollar assumption of $75,000 payable at the beginning of each year was introduced for each plan.

The investment return assumption of 7.50% is assumed to be net of investment expenses. If the amount of administrative expenses paid from plan assets is shown to stay closer to $250,000, we would increase this assumption with the 2015 valuation.

F. Cost-of-Living Assumptions

The COLA assumption is used to determine the assumed annual increase in the retirement benefit for retirees subject to increases based on 50% of the negotiated pay increases for active participants.

Retirees in the Firefighters Plan receive an annual COLA equal to one-half of the negotiated base pay increase for active firefighters. Based on the current 3.25% assumed payroll growth, the COLA assumption for the Firefighters valuation is 1.625%. Police Plan participants who retired prior to July 1, 2005 have this same provision while participants who retired after June 30, 2005 receive 3.00% increases compounded each year. The Police valuation uses a 1.625% assumed increase rate for participants who retired prior to July 1, 2005 and 3.00% otherwise.

We are not recommending any changes in the COLA assumption at this time.

III. Demographic Assumptions

The demographic assumptions used to value the Plan reflect the expected occurrences of various events among participants of the Plan. The assumptions should reflect specific characteristics of the plan and produce reasonable results. A reasonable assumption is one that is expected to model the contingency being measured and not expected to produce significant gains or losses over time. The types of demographic assumptions used to measure pension obligations include, but are not limited to the following:

> Mortality;

> Termination of Employment (Withdrawal);

> Retirement;

> Disability; and

> Others, including Percent Married and Spousal Age Difference

The Actuarial Standards Board (ASB) has adopted Actuarial Standard of Practice No. 35 (ASOP 35 - Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations) to provide actuaries guidance in developing demographic assumptions. The standard recommends the actuary follow a general process for selecting demographic assumptions. The first step of the general procedure is to identify the types of assumptions to use. The actuary should consider relevant plan provisions that will affect timing and value of any potential benefit payments, all contingencies that give rise to benefits or loss of benefits and the characteristics of the covered group. The next step is to identify the relevant assumption universe. The assumption universe may include prior experience studies or general studies of trends relevant to the type of demographic assumption in addition to plan experience to the extent that it is credible. The third step is to consider the assumption format. The format may include different tables for different segments of the covered population (i.e. different mortality tables for males and females, or different turnover before and after a select period). The final step is to select the specific assumption and evaluate the reasonableness of each assumption. The specific experience of the plan should be incorporated but not given undue weight to past experience if some of that experience is attributable to a phenomenon that is unlikely to continue. For example, if recent rates of termination were due to a one-time reduction in workforce it may be unreasonable to assume that such rates will continue.

A. Mortality Rates

One of the most basic actuarial assumptions is the probability of death. The mortality assumption takes the form of a mortality table which contains for each age in the table a probability of a person dying between that age and the next. There are two sets of mortality tables currently in use for the Plan. There are different mortality assumptions for non-disabled lives (which include pre-retirement and post-retirement participants) and for disabled retirees. The mortality rates match those used for MERS. Mortality rates are as follows:

Non-disabled lives:
Healthy Mortality for Males: 115% of the RP-2000 Combined Healthy Mortality Table for Males with White Collar adjustments, projected with Scale AA from 2000

Healthy Mortality for Females: 95% of the RP-2000 Combined Healthy Mortality Table for Females with White Collar adjustments, projected with Scale AA from 2000

Disabled lives:
Disabled Mortality for Males: 60% of PBGC Table V(a) for disabled males eligible for Social Security disability benefits

Disabled Mortality for Females: 60% of PBGC Table VI(a) for disabled females eligible for Social Security disability benefits

Changes to ASOP 35 have increased the actuary's responsibility to reflect and to disclose the allowance for future mortality improvement. Ways to reflect anticipated future mortality improvement include:

> Generational mortality. Each year of birth has its own mortality table that reflects the forecasted improvements. Thus, younger participants have more future mortality improvement built in than older participants do.

> Projection to a future year. The same mortality table is used for everyone, but that table is intended to be reflective of mortality at a future date, not as of today.

> Mortality of a longer-lived group. The table in use, without projection, forecasts fewer deaths than the current experience level, thus implicitly allowing for future mortality improvement.

1. Healthy Mortality

The mortality experience among retirees and beneficiaries determines the durations over which retirement benefits are paid. Lower mortality rates mean longer benefit payment periods and, therefore, higher benefit costs.

Due to the lack of credible experience for the combined System, we recommend continuing to match the MERS assumptions which have not been updated since our last experience review.

The experience analysis for the study period reveals that retirees and beneficiaries are dying at a rate higher than expected for Police and lower than expected for Firefighters. The following table provides a summary of retiree and beneficiary mortality experience by gender for the study period:

Post-Retirement Healthy Mortality	Exposures	Actual Deaths	Expected Deaths	Ratio of Actual Deaths to Expected Deaths
Police Male	158	5	2.26	221%
Police Female	59	4	1.69	237%
Police Total	**217**	**9**	**3.95**	**228%**
Firefighters Male	120	0	1.18	0%
Firefighters Female	9	1	0.09	1111%
Firefighters Total	**129**	**1**	**1.27**	**79%**

On the following pages, Tables 3A and 3B shows the post-retirement healthy mortality experience for the study period. Graphs 3A, 3B, 3C and 3D illustrate this information for males and females, Police and Firefighters, respectively.

TABLE 3A:
POST-RETIREMENT HEALTHY MORTALITY - POLICE
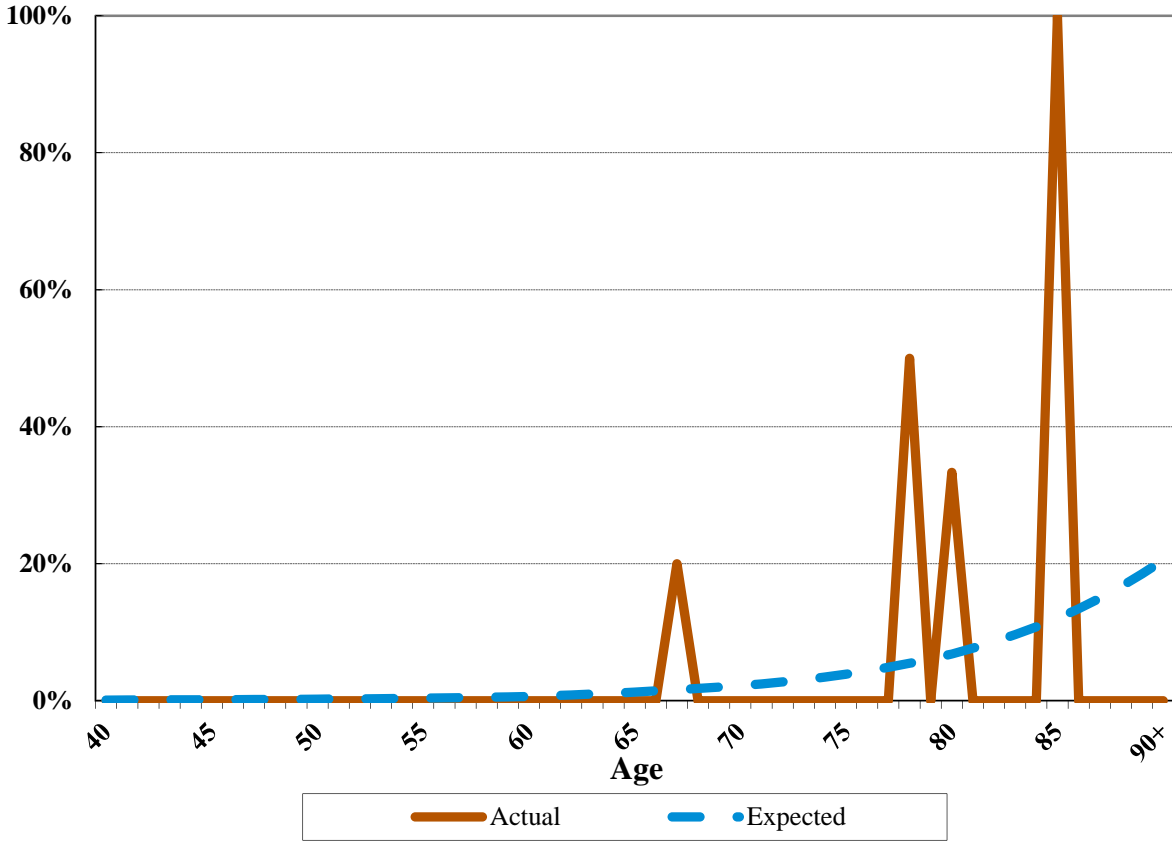## FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014
MALE

Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 50	39	0	0.00%	0.07	0.17%	0.00%
50-54	44	0	0.00%	0.13	0.29%	0.00%
55-59	9	0	0.00%	0.04	0.42%	0.00%
60-64	11	0	0.00%	0.11	0.96%	0.00%
65-69	18	1	5.56%	0.31	1.74%	319.98%
70-74	17	0	0.00%	0.45	2.65%	0.00%
75-79	15	2	13.33%	0.76	5.04%	264.65%
80-84	4	1	25.00%	0.28	7.04%	354.90%
85-89	1	1	100.00%	0.12	12.04%	830.81%
90 & Over	0	0	0.00%	0.00	0.00%	0.00%
Total	**158**	**5**	**3.16%**	**2.26**	**1.43%**	**221.24%**

FEMALE

Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 50	8	0	0.00%	0.01	0.10%	0.00%
50-54	6	0	0.00%	0.01	0.16%	0.00%
55-59	0	0	0.00%	0.00	0.00%	0.00%
60-64	6	0	0.00%	0.04	0.69%	0.00%
65-69	10	0	0.00%	0.10	1.05%	0.00%
70-74	6	0	0.00%	0.11	1.81%	0.00%
75-79	10	0	0.00%	0.27	2.73%	0.00%
80-84	5	0	0.00%	0.22	4.47%	0.00%
85-89	1	1	100.00%	0.08	7.87%	1270.76%
90 & Over	7	3	42.86%	0.84	11.98%	357.61%
Total	**59**	**4**	**6.78%**	**1.69**	**2.86%**	**236.69%**

Grand Total	**217**	**9**	**4.15%**	**3.95**	**1.82%**	**227.85%**

GRAPH 3A:
POST-RETIREMENT HEALTHY MORTALITY RATES – POLICE (MALE)

GRAPH 3B:
POST-RETIREMENT HEALTHY MORTALITY RATES – POLICE (FEMALE)

TABLE 3B:
POST-RETIREMENT HEALTHY MORTALITY - FIREFIGHTERS
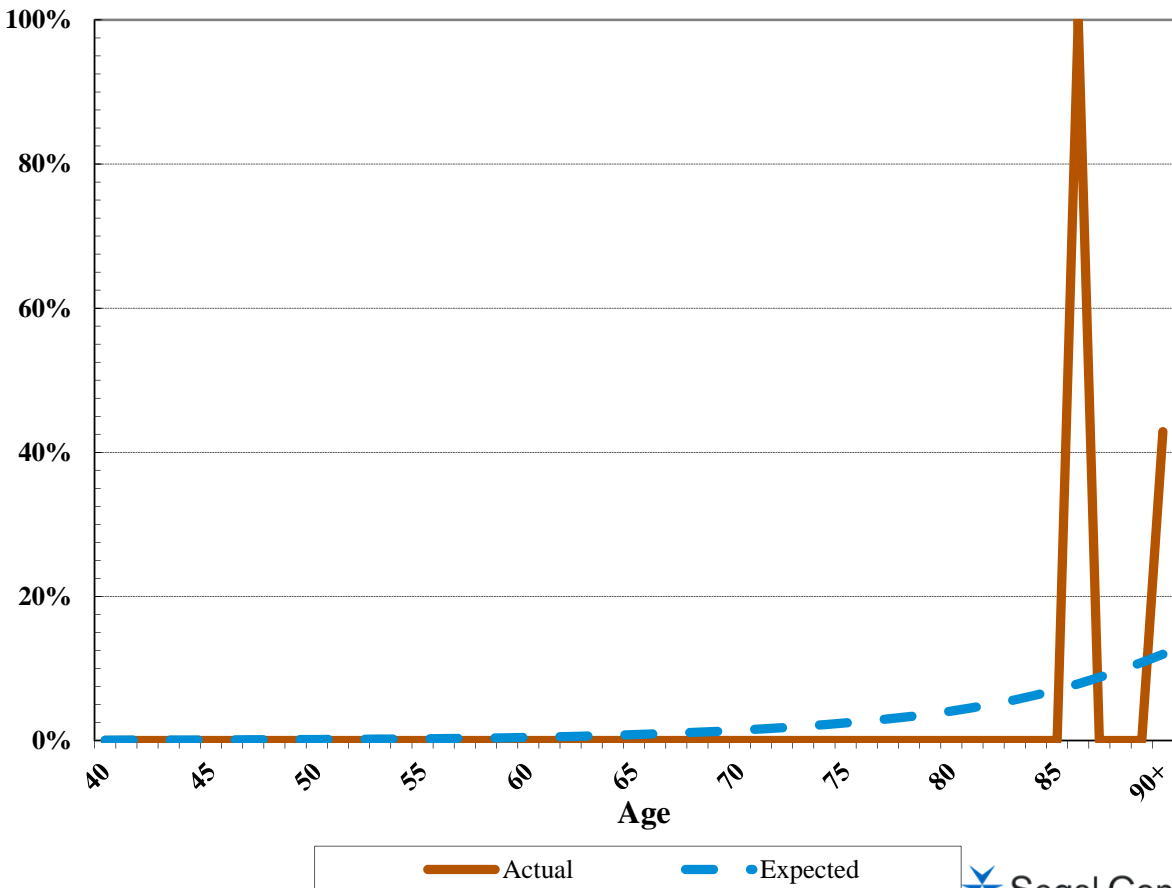## FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014
MALE

| Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 50	24	0	0.00%	0.04	0.18%	0.00%
50-54	23	0	0.00%	0.06	0.27%	0.00%
55-59	24	0	0.00%	0.12	0.50%	0.00%
60-64	17	0	0.00%	0.13	0.79%	0.00%
65-69	18	0	0.00%	0.28	1.55%	0.00%
70-74	8	0	0.00%	0.20	2.54%	0.00%
75-79	5	0	0.00%	0.27	5.40%	0.00%
80-84	1	0	0.00%	0.07	6.83%	0.00%
85-89	0	0	0.00%	0.00	0.00%	0.00%
90 & Over	0	0	0.00%	0.00	0.00%	0.00%
Total	**120**	**0**	**0.00%**	**1.18**	**0.98%**	**0.00%**

FEMALE

Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 50	0	0	0.00%	0.00	0.00%	0.00%
50-54	0	0	0.00%	0.00	0.00%	0.00%
55-59	3	0	0.00%	0.01	0.35%	0.00%
60-64	3	0	0.00%	0.02	0.57%	0.00%
65-69	0	0	0.00%	0.00	0.00%	0.00%
70-74	2	0	0.00%	0.04	2.10%	0.00%
75-79	1	1	100.00%	0.02	2.44%	4093.16%
80-84	0	0	0.00%	0.00	0.00%	0.00%
85-89	0	0	0.00%	0.00	0.00%	0.00%
90 & Over	0	0	0.00%	0.00	0.00%	0.00%
Total	**9**	**1**	**11.11%**	**0.09**	**1.00%**	**1111.11%**

| **Grand Total** | **129** | **1** | **0.78%** | **1.27** | **0.98%** | **78.74%** |

GRAPH 3C:
POST-RETIREMENT HEALTHY MORTALITY RATES – FIREFIGHTERS (MALE)
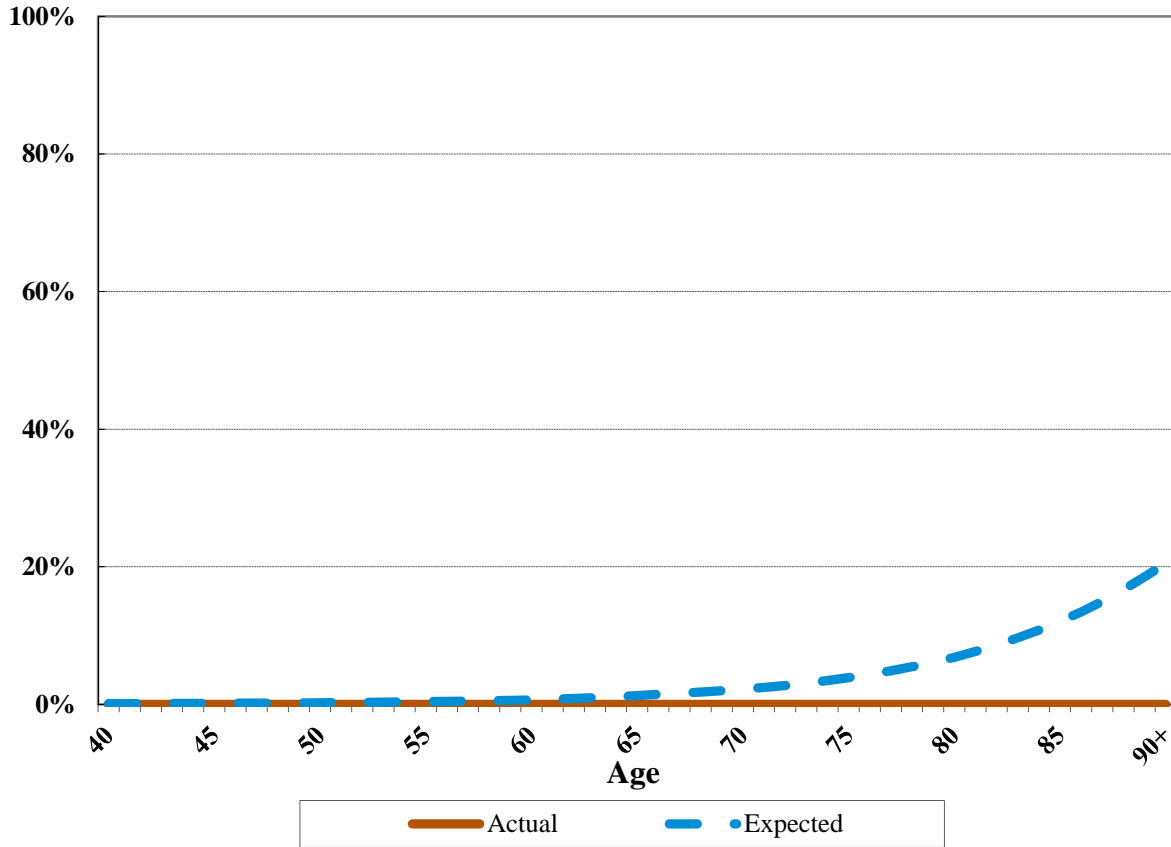
GRAPH 3D:
POST-RETIREMENT HEALTHY MORTALITY RATES – FIREFIGHTERS (FEMALE)
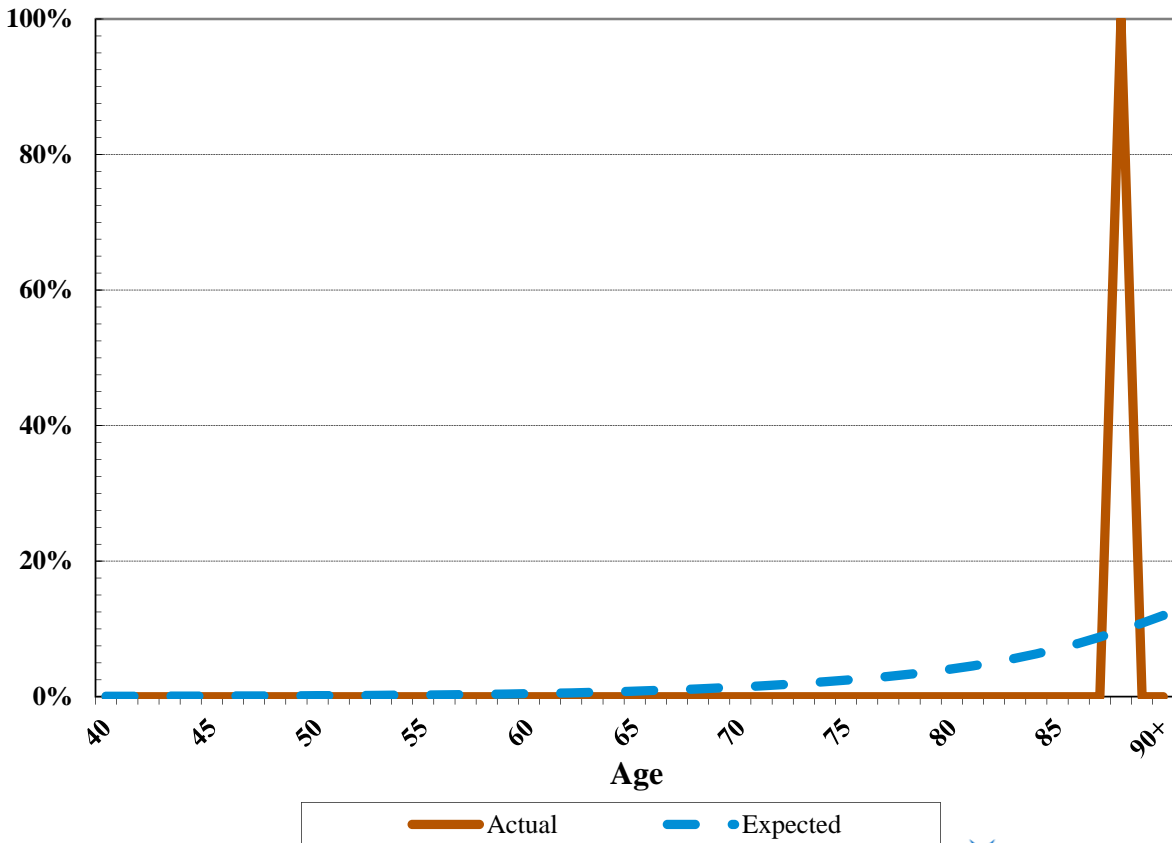
2. Disabled Annuitant Mortality

Mortality experience among disabled annuitants is studied separately from other retirees because of characteristically higher levels of mortality exhibited by disabled retirees. The current assumption for disabled male lives is based on 60% of PBGC Table V(a) for disabled males eligible for Social Security disability benefits. The current assumption for disabled female lives is based on 60% of PBGC Table VI(a) for disabled females eligible for Social Security disability benefits.

Among disabled lives in pay status, the Police Plan mortality rates were more than expected for males and less than expected for females. The Firefighters Plan mortality rates were less than expected for both males and females. The following table summarizes the disabled annuitant mortality experience:

Disabled Annuitant Mortality	Exposures	Actual Deaths	Expected Deaths	Ratio of Actual Deaths to Expected Deaths
Police Male	54	4	2.69	149%
Police Female	9	0	0.12	0%
Police Total	**63**	**4**	**2.81**	**142%**
Firefighters Male	99	0	2.96	0%
Firefighters Female	3	0	0.04	0%
Firefighter Total	**102**	**0**	**3.00**	**0%**

Due to the small numbers of participants in both Plans, the disabled experience is generally not considered credible. It is our understanding that the State of Rhode Island will deem the mortality assumptions reasonable if they match the assumptions used for the State of Rhode Island Municipal Employees Retirement System (MERS). Since the current assumption matches the MERS disabled annuitant mortality assumption in place as of June 30, 2014 (unchanged from the MERS assumption at June 30, 2011), we are not recommending a change in the disabled annuitant mortality at this time.

Tables 4A and 4B summarize the disabled annuitant mortality experience for the study period for Police and Firefighter respectively. Graphs 4A, 4B, 4C and 4D illustrate this information for males and females.

TABLE 4A:
DISABLED ANNUITANT MORTALITY - POLICE
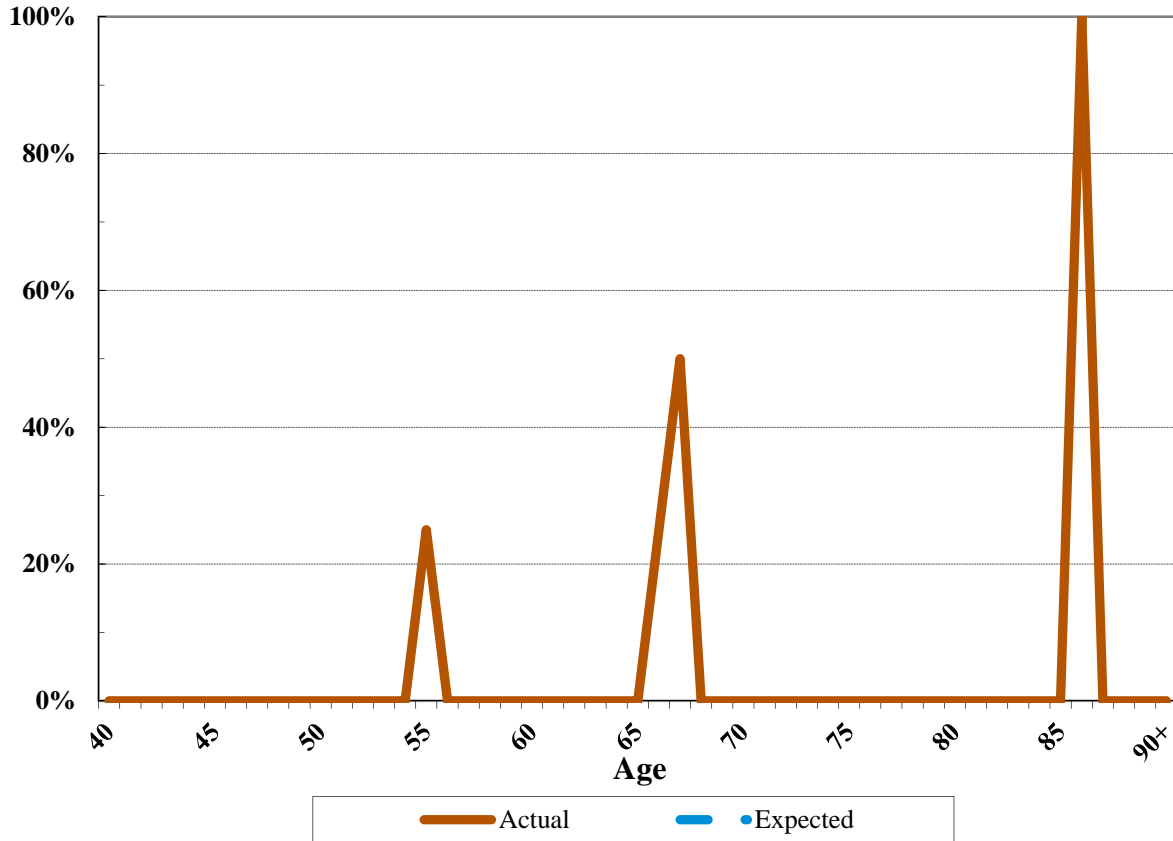## FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014
MALE

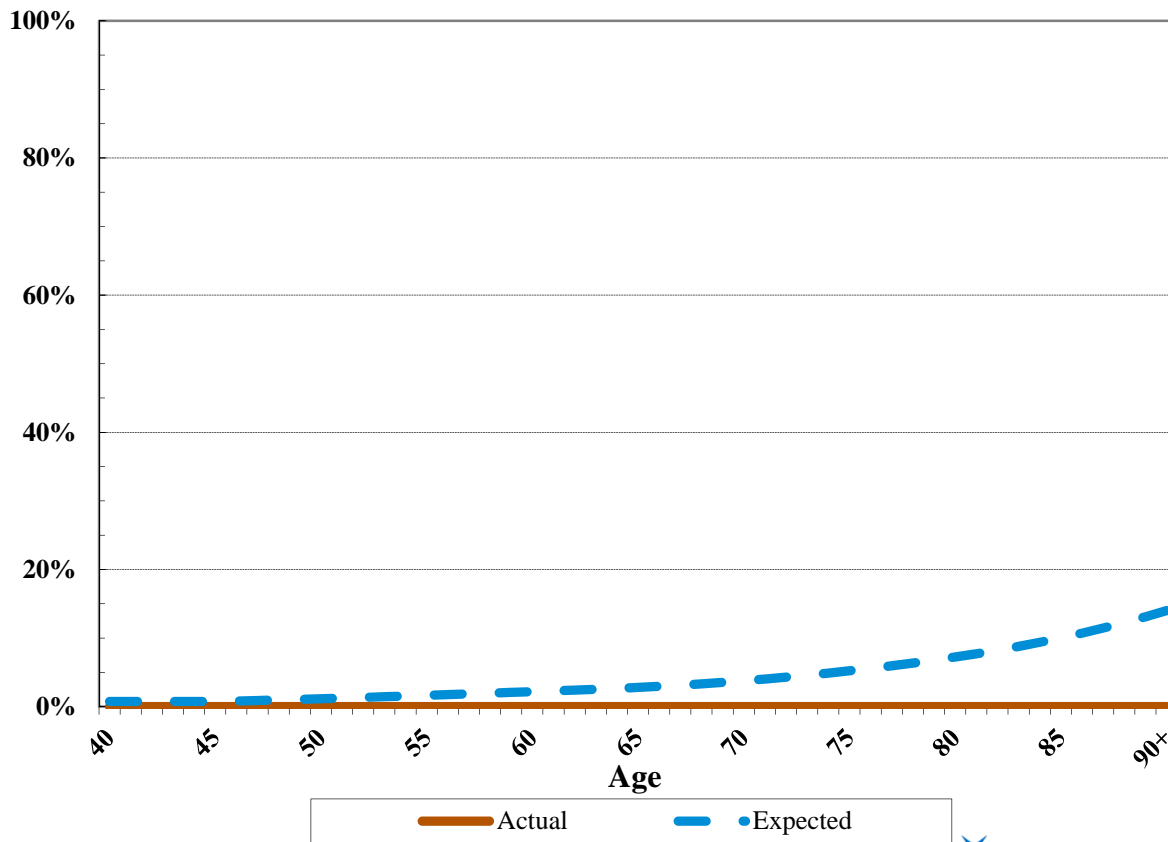| Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 45	6	0	0.00%	0.14	2.26%	0.00%
45-49	4	0	0.00%	0.10	2.61%	0.00%
50-54	12	0	0.00%	0.38	3.16%	0.00%
55-59	8	1	12.50%	0.29	3.64%	343.31%
60-64	6	0	0.00%	0.28	4.67%	0.00%
65-69	11	2	18.18%	0.58	5.32%	342.00%
70-74	2	0	0.00%	0.14	7.17%	0.00%
75-79	1	0	0.00%	0.09	8.70%	0.00%
80 & Over	4	1	25.00%	0.68	17.11%	146.11%
Total	**54**	**4**	**7.41%**	**2.69**	**4.98%**	**148.70%**

FEMALE

Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 45	3	0	0.00%	0.02	0.75%	0.00%
45-49	0	0	0.00%	0.00	0.00%	0.00%
50-54	3	0	0.00%	0.05	1.52%	0.00%
55-59	3	0	0.00%	0.05	1.69%	0.00%
60-64	0	0	0.00%	0.00	0.00%	0.00%
65-69	0	0	0.00%	0.00	0.00%	0.00%
70-74	0	0	0.00%	0.00	0.00%	0.00%
75-79	0	0	0.00%	0.00	0.00%	0.00%
80 & Over	0	0	0.00%	0.00	0.00%	0.00%
Total	**9**	**0**	**0.00%**	**0.12**	**1.33%**	**0.00%**

| **Grand Total** | **63** | **4** | **6.35%** | **2.81** | **4.46%** | **142.35%** |

GRAPH 4A:
DISABLED ANNUITANT MORTALITY RATES – POLICE (MALE)

GRAPH 4B:
DISABLED ANNUITANT MORTALITY RATES – POLICE (FEMALE)

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TABLE 4B:
DISABLED ANNUITANT MORTALITY EXPERIENCE - FIREFIGHTERS
FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014
MALE

Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 45	19	0	0.00%	0.33	1.76%	0.00%
45-49	15	0	0.00%	0.31	2.06%	0.00%
50-54	17	0	0.00%	0.43	2.55%	0.00%
55-59	10	0	0.00%	0.32	3.25%	0.00%
60-64	24	0	0.00%	0.93	3.86%	0.00%
65-69	8	0	0.00%	0.33	4.13%	0.00%
70-74	2	0	0.00%	0.09	4.49%	0.00%
75-79	4	0	0.00%	0.21	5.29%	0.00%
80 & Over	0	0	0.00%	0.00	0.00%	0.00%
Total	**99**	**0**	**0.00%**	**2.96**	**2.99%**	**0.00%**

FEMALE

| Age	Total Exposures	Actual Deaths	Actual Mortality Rate	Expected Deaths	Current Mortality Rate	Ratio of Actual Rate to Expected Rate
Under 45	3	0	0.00%	0.04	1.26%	0.00%
45-49	0	0	0.00%	0.00	0.00%	0.00%
50-54	0	0	0.00%	0.00	0.00%	0.00%
55-59	0	0	0.00%	0.00	0.00%	0.00%
60-64	0	0	0.00%	0.00	0.00%	0.00%
65-69	0	0	0.00%	0.00	0.00%	0.00%
70-74	0	0	0.00%	0.00	0.00%	0.00%
75-79	0	0	0.00%	0.00	0.00%	0.00%
80 & Over	0	0	0.00%	0.00	0.00%	0.00%
Total	**3**	**0**	**0.00%**	**0.04**	**1.33%**	**0.00%**

| **Grand Total** | **102** | **0** | **0.00%** | **3.00** | **2.94%** | **0.00%** |

GRAPH 4C:
DISABLED ANNUITANT MORTALITY RATES – FIREFIGHTERS (MALE)
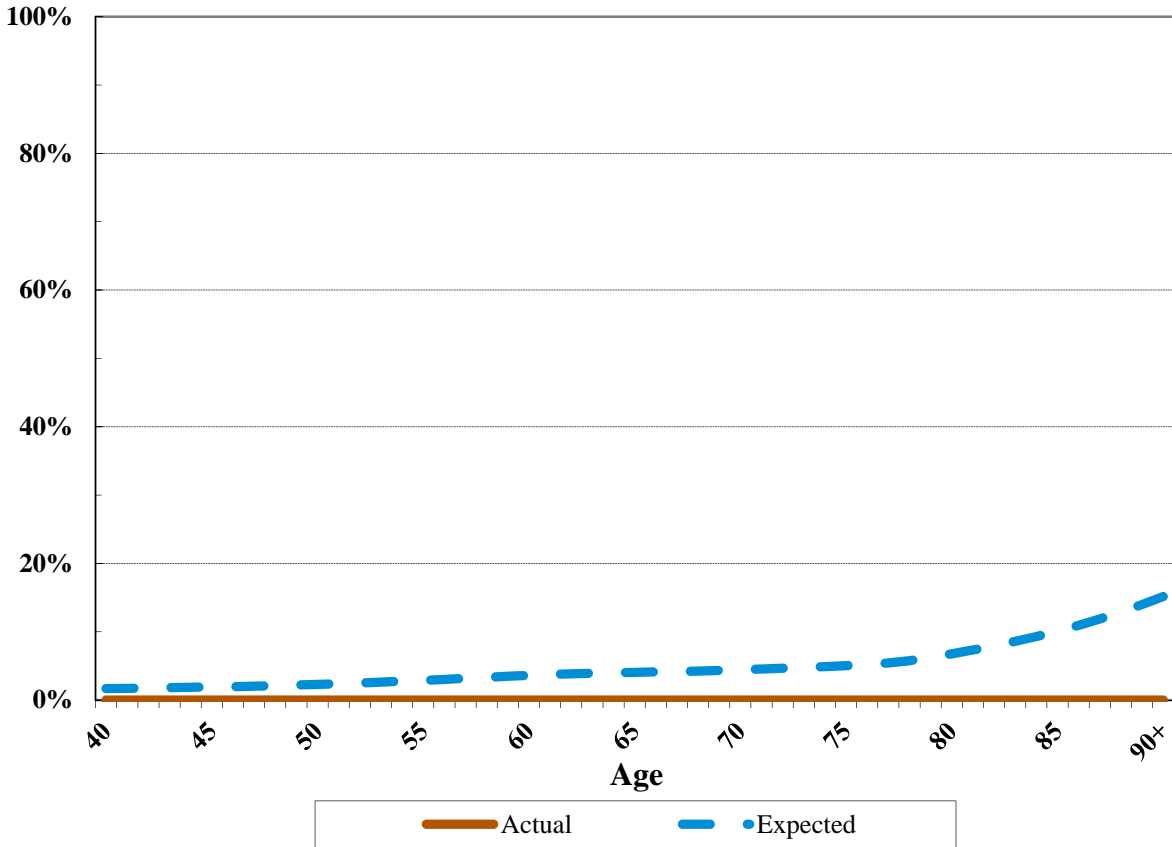
GRAPH 4D:
DISABLED ANNUITANT MORTALITY RATES – FIREFIGHTERS (FEMALE)
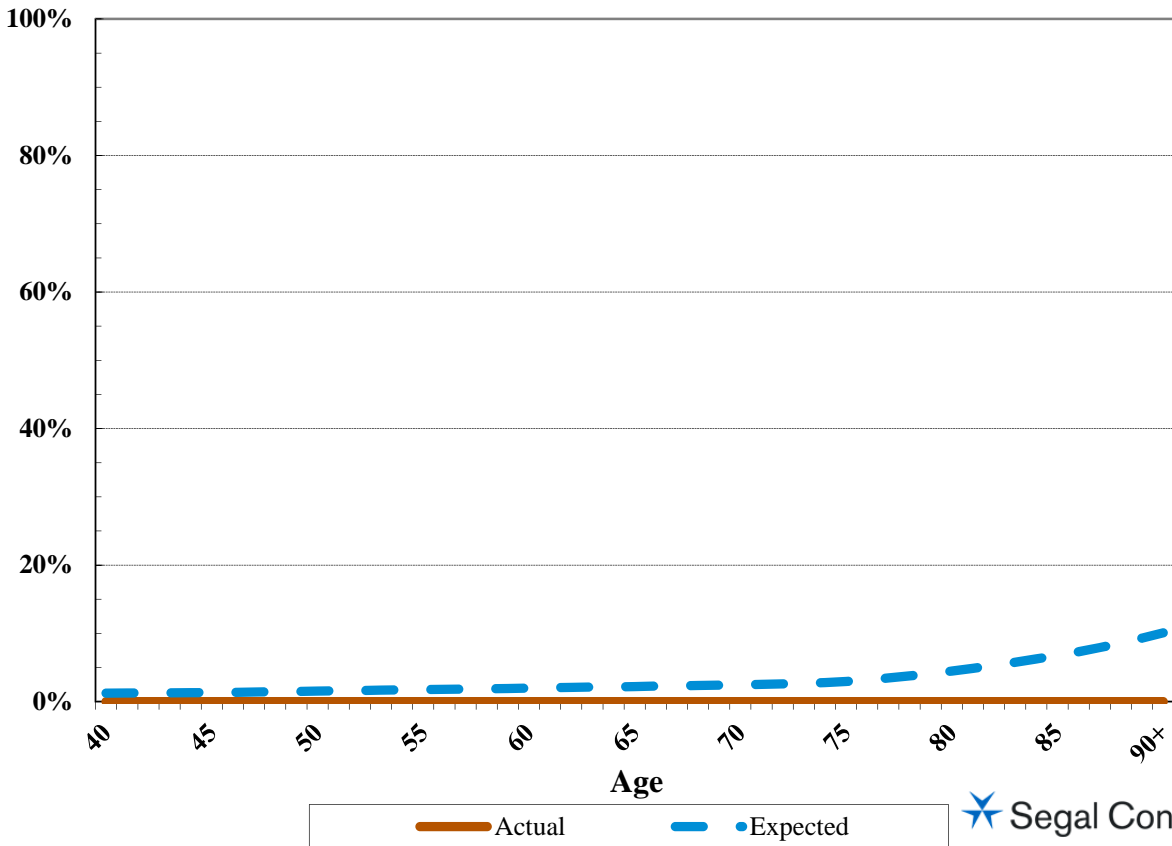
B. Turnover Rates

The assumed turnover rates used in annual actuarial valuations project the percentage of employees at each age or service duration who will terminate employment prior to retirement. These rates take into account possible terminations from all causes other than retirement, death, or disability. They include both voluntary and involuntary withdrawals from service.

Terminations before retirement give rise to some benefit rights, but may also involve the forfeiture of a portion of previously accrued benefits. Forfeitures resulting from turnover are anticipated in advance and help finance benefits which become payable to other employees.

Currently, no participants in either Plan are assumed to withdraw. During the three-year study period, one police officer and no firefighters withdrew from the force. Since no new hires will be eligible for either Plan, we recommend continuing the current assumption of no withdrawals.

C. Retirement Rates

Under the Plan, Police participants are eligible to retire with an unreduced benefit after attaining 18 years of service, regardless of age. Likewise, Firefighters participants are allowed to retire at any age upon attaining 20 years of service.

An accurate prediction of the ages at which members will retire is essential in order to obtain a realistic assessment of the Plan's liabilities for retirement benefits. Because retirement accounts for most of the plan's liability, it is important to review this assumption thoroughly in order to predict the relative value of retirement benefits versus ancillary (i.e., death and disability) benefits, and to properly measure the overall magnitude of retirement liabilities.

A total of 19 participants retired during the study period.
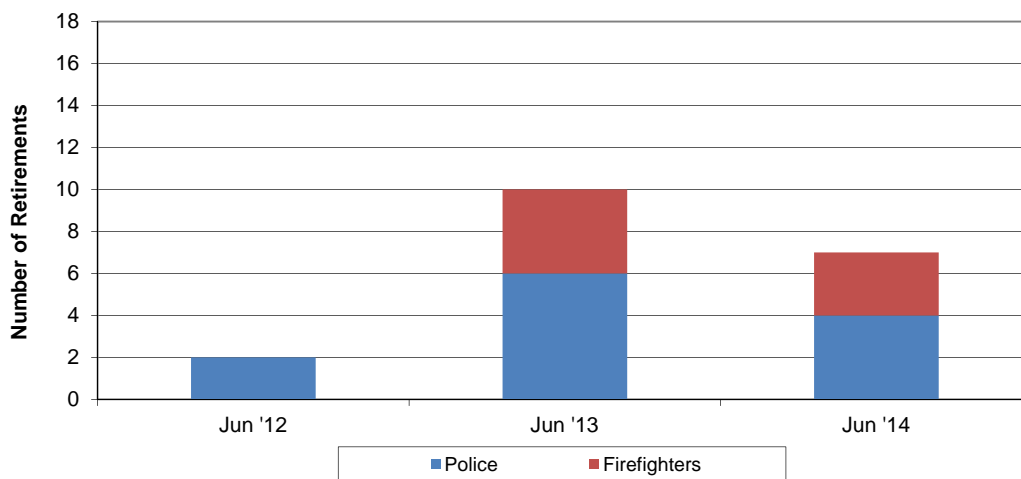
The actual number of retirements has been more than expected for Police and less than expected for Firefighters, as shown in the table below.

Group	Exposures	Actual Retirements	Expected Retirements	Ratio of Actual Retirements to Expected Retirements
Police	198	12	8.15	147%
Firefighters	113	7*	8.00	88%
Total	**311**	**19**	**16.15**	**118%**

* Includes 3 Firefighters with less than 20 years of service at retirement, prior to purchase of military service.

Currently, each plan has their own unique set of service-related retirement rates based on years of service at retirement. We are proposing modifying the rates of retirement for the Police Plan only. Table 5 shows the actual, expected and proposed number of retirements for Police. Graph 5 displays the actual, expected and new proposed retirement rates. Table 6 shows the actual and expected number of retirements for Firefighters while Graph 6 displays the actual and expected retirement rates for this group.

A complete table of proposed rates for the Police Plan is shown in Appendix A.

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TABLE 5:
RETIREMENT RATES – POLICE
FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014

| Age	Total Exposures	Actual Retirements	Actual Retirement Rate	Expected Retirements	Current Retirement Rate	Proposed Retirements	Proposed Retirement Rate
Under 18	170	0	0.00%	0.00	0.00%	0.00%	0.00
18	7	2	28.57%	1.05	15.00%	25.00%	1.75
19	3	2	66.67%	0.45	15.00%	25.00%	0.75
20	2	1	50.00%	0.30	15.00%	25.00%	0.50
21	1	1	100.00%	0.15	15.00%	35.00%	0.35
22	3	0	0.00%	0.45	15.00%	35.00%	1.05
23	5	2	40.00%	0.75	15.00%	50.00%	2.50
24	4	1	25.00%	2.00	50.00%	50.00%	2.00
25 & Over	3	3	100.00%	3.00	100.00%	100.00%	3.00
Total	**198**	**12**	**6.06%**	**8.15**	**4.12%**	**6.01%**	**11.90**

GRAPH 5:
RETIREMENT RATES – POLICE
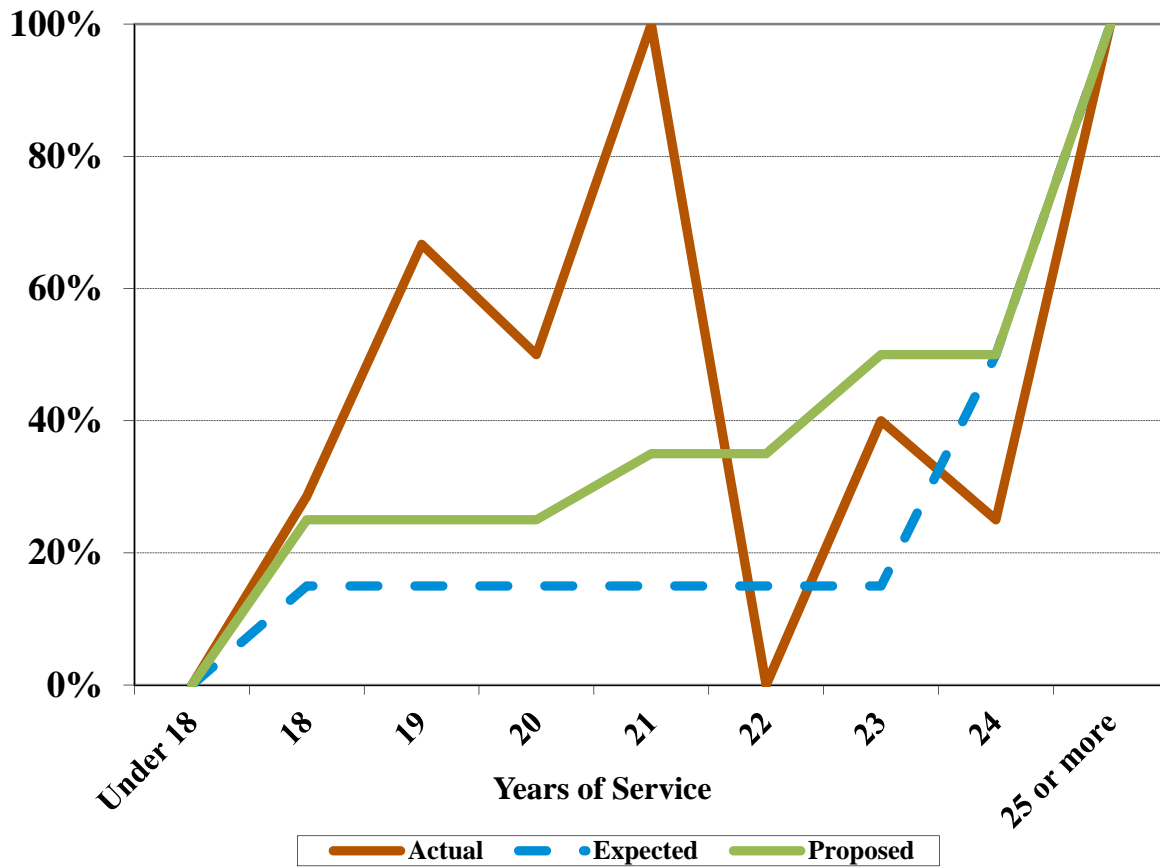
TABLE 6:
RETIREMENT RATES – FIREFIGHTERS
FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014

Age	Total Exposures	Actual Retirements	Actual Retirement Rate	Expected Retirements	Current Retirement Rate
Under 20	101	0	0.00%	0.00	0.00%
20	8	6	75.00%	6.00	75.00%
21	4	1	25.00%	2.00	50.00%
22	0	0	0.00%	0.00	50.00%
23	0	0	0.00%	0.00	50.00%
24	0	0	0.00%	0.00	50.00%
25	0	0	0.00%	0.00	50.00%
26 & Over	0	0	0.00%	0.00	100.00%
Total	**113**	**7**	**6.19%**	**8.00**	**7.08%**

GRAPH 6:
RETIREMENT RATES – FIREFIGHTERS

Years of Service

Actual   Expected
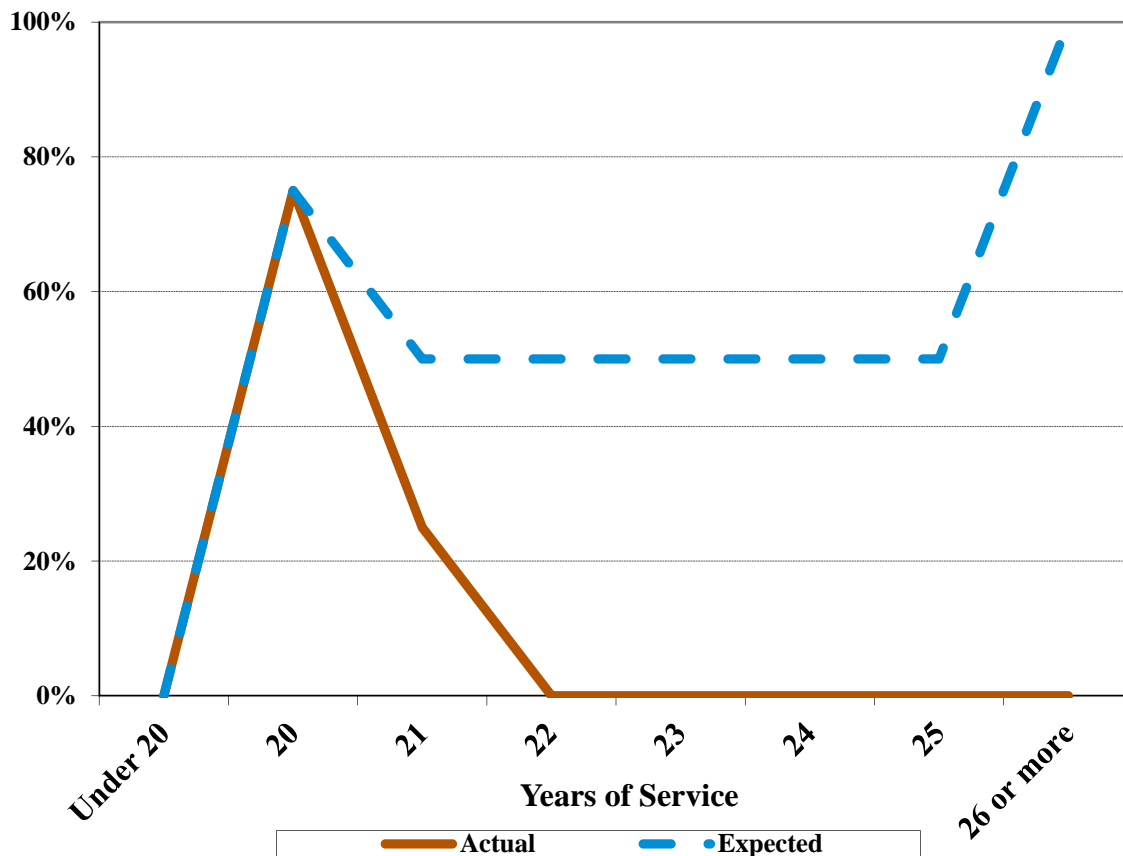
D. Disability Rates

Disability rate tables function in the same way as mortality tables. The rate at each age indicates the probability of becoming disabled before the next age. Disability rates add liability for the value of the disability benefits, but lessen the value of retirement benefits ultimately payable, since anyone who becomes disabled will generally not accrue a full service benefit.

Plan participants are eligible for service-related disability benefits at any age. The current disability assumption is a table of unisex rates based on age. Chart 7 summarizes the experience during the study period. Graphs 7A and 7B summarize the experience during the three-year study period.

For the study period, the actual number of disabilities was lower than expected in the Firefighters Plan and slightly lower than expected in the Police Plan. The following table summarizes the disability experience:

	Exposures	Actual Disabilities	Expected Disabilities	Ratio of Actual Disabilities to Expected Disabilities
Police	198	2	2.03	99%
Firefighter	114	1	1.60	62%
Total	**312**	**3**	**3.63**	**83%**

As shown on the charts, during the study period, police officers had an overall higher rate of disability than firefighters. Since the number of disabilities is low, we are not recommending any changes in the disability rates.

TABLE 7:
DISABILITY RATES
FOR THE PERIOD JULY 1, 2011 THROUGH JUNE 30, 2014
POLICE

| Age	Total Exposures	Actual Disabilities	Actual Disability Rate	Expected Disabilities	Current Disability Rate	Ratio of Actual Rate to Expected Rate
Under 20	0	0	0.00%	0.00	0.00%	0.00%
20-24	2	0	0.00%	0.00	0.00%	0.00%
25-29	24	0	0.00%	0.09	0.39%	0.00%
30-34	53	1	1.89%	0.26	0.49%	386.16%
35-39	23	1	4.35%	0.17	0.74%	588.24%
40-44	47	0	0.00%	0.52	1.11%	0.00%
45-49	32	0	0.00%	0.57	1.78%	0.00%
50-54	11	0	0.00%	0.27	2.42%	0.00%
55-59	3	0	0.00%	0.07	2.42%	0.00%
60-64	0	0	0.00%	0.00	0.00%	0.00%
65 & Over	3	0	0.00%	0.07	2.42%	0.00%
Total	**198**	**2**	**1.01%**	**2.03**	**1.02%**	**98.69%**

FIREFIGHTERS

Age	Total Exposures	Actual Disabilities	Actual Disability Rate	Expected Disabilities	Current Disability Rate	Ratio of Actual Rate to Expected Rate
Under 20	0	0	0.00%	0.00	0.00%	0.00%
20-24	0	0	0.00%	0.00	0.00%	0.00%
25-29	0	0	0.00%	0.00	0.00%	0.00%
30-34	0	0	0.00%	0.00	0.00%	0.00%
35-39	10	0	0.00%	0.08	0.78%	0.00%
40-44	56	1	1.79%	0.63	1.13%	158.31%
45-49	41	0	0.00%	0.72	1.77%	0.00%
50-54	4	0	0.00%	0.10	2.42%	0.00%
55-59	3	0	0.00%	0.07	2.42%	0.00%
60-64	0	0	0.00%	0.00	0.00%	0.00%
65 & Over	0	0	0.00%	0.00	0.00%	0.00%
Total	**114**	**1**	**0.88%**	**1.60**	**1.41%**	**62.38%**

GRAPH 7A:
DISABILITY RATES - POLICE
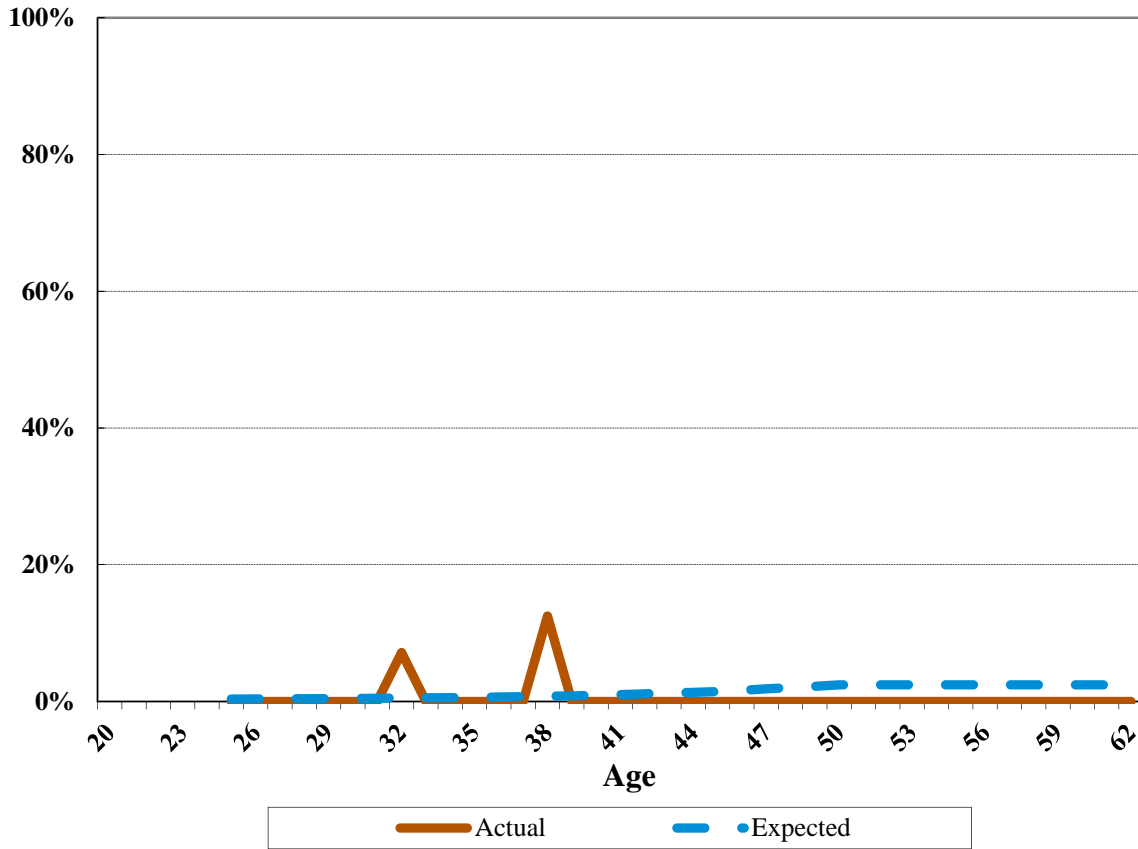
GRAPH 7B:
DISABILITY RATES – FIREFIGHTERS
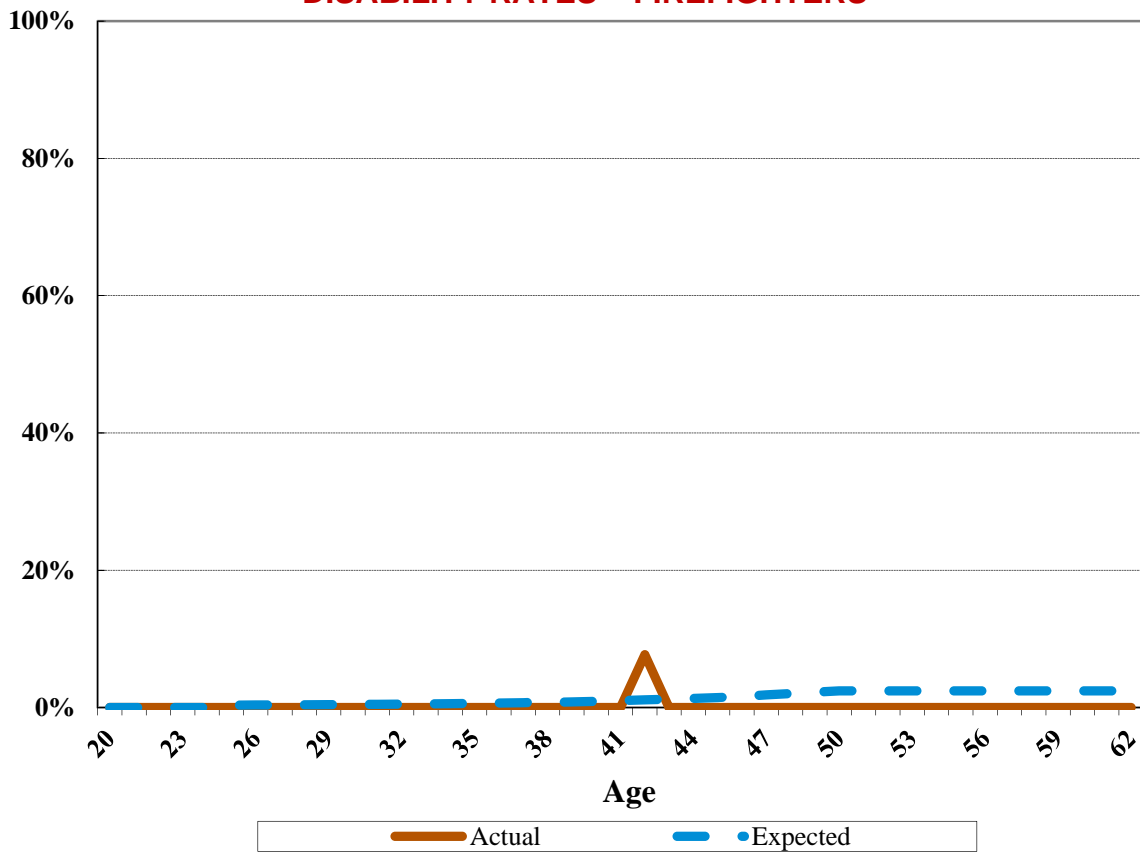
E. Marriage Assumption and Spousal Age Difference

As described in the Executive Summary, we recommend maintaining the assumed married percentage of 85% as well as maintaining the assumption that female spouses are three years younger than male spouses.

IV. Actuarial Methods

A. Asset Smoothing

There was a historical drop in the Plan's assets during the 2008-2009 plan year and many plans are revisiting the methodology for determining the actuarial value of assets. Most ongoing plans use some form of asset smoothing with a corridor around the market value of assets. The most common smoothing period is five years and the most common corridor is 20%. Recently, the Society of Actuaries issued Actuarial Standards of Practice (ASOP) No. 44 to provide actuaries guidance with smoothing techniques. This ASOP provides guidance in helping the actuary determine a "reasonable" smoothing period and corridor. In light of ASOP No. 44 and that both Plans are closed to new hires, we are not proposing a change in asset method.

B. Actuarial Cost Method

Actuarial cost methods are the means by which the present value of future benefits are allocated over the working lifetime of plan participants. The most commonly used method for public sector plans is the Entry Age Normal method.

Under the Entry Age Normal method the annual normal cost is a function of the member's plan entry age and represents the share of the cost of the expected retirement benefit that is allocated to each year. The allocation is designed to produce a normal cost that remains level as a percentage of payroll for the working career of the member. The Entry Age Normal method develops a normal cost that stays constant as a percentage of payroll for each member.

The Segal Company uses a variation of the Entry Age Normal method called the Replacement Life method. It recognizes that every member that retires is likely to be *replaced* by a new member. This method bases the normal cost exclusively on the most recent plan provisions, and allows historical plan structures to all flow into the actuarial accrued liability calculation. We have found that this approach provides a more stable and level normal cost calculation, because the normal costs for current members and new members are based on exactly the same plan design.

As most of the System's liabilities are attributable to retirees and beneficiaries in pay status, the normal cost calculation has minimal impact on plan cost. We are therefore not recommending any changes to the method at this time.

C. Amortization of Unfunded Actuarial Accrued Liability

The unfunded actuarial accrued liability (UAAL) is amortized on a level dollar basis over a closed 24-year period commencing on July 1, 2012. There are 22 years remaining on this period as of July 1, 2014.We recommend continuation of the level dollar method, that the period remain closed, and that the period not be reset.

V. Appendices

Appendix A. Proposed Retirement Rates

Police Years of Service at Retirement	
Service	**Rate**
Under 18	0.00%
18	25.00%
19	25.00%
20	25.00%
21	35.00%
22	35.00%
23	50.00%
24	50.00%
25 & Over	100.00%