

# Town of Smithfield

## Retirement Plan for Former Employees of the Police Department of the Town of Smithfield

### Results of the Experience Study

Period Covering

July 1, 2009 – June 30, 2014

May 2015





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Mr. Randy R. Rossi  
Finance Director  
Town of Smithfield  
64 Farnum Pike  
Smithfield, RI 02917

Dear Randy:

The results of our experience study of the Retirement Plan for Former Employees of the Police Department of the Town of Smithfield covering the five-year period ending June 30, 2014, are described in this report, along with our recommendations for changes in the present assumptions.

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

Respectfully submitted,

A handwritten signature in black ink that reads "David Driscoll". The signature is written in a cursive, slightly slanted style.

David L. Driscoll, FSA, EA, MAAA  
Principal, Consulting Actuary

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Smithfield Fire 042415 JD\_ExperienceStudy2015

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# I. Introduction

In order to accumulate funds to pay retirement benefits on a reasonable and relatively stable basis, the actuary prepares annual valuations of the Plan's assets and liabilities to measure the funded status and to ensure that funding is progressing at a rate that is adequate to meet the Plan's obligations.

The primary purposes of funding are to equitably allocate costs between generations of taxpayers and to provide security to members, who view the funds set aside as assurance that their benefits will be paid.

While the ultimate cost of the Plan is not determinable until all benefits are paid and expenses provided for, each actuarial valuation attempts to estimate costs based on assumptions selected to predict, as accurately as possible, future experience in order to produce stable contribution rates.

Overly conservative or aggressive assumptions will result in actuarial gains or losses each year. When translated into contributions, this will result in decreasing or increasing contribution rates and an inequitable allocation of costs.

The major categories of actuarial assumptions are:

- (a) Active service demographic assumptions,
- (b) Compensation increase assumptions,
- (c) Post-retirement mortality rates, and
- (d) Interest rate.

As this plan covers only retirees and their beneficiaries, only the latter two categories are relevant

Before presenting our analysis of the Plan's experience and discussion of the proposed assumptions, it is important to outline considerations that should govern the selection of actuarial assumptions. The recommendations of the American Academy of Actuaries are as follows:

- (i) The actuarial assumptions selected should reflect the actuary's best judgement of future events. They should take into account actual experience to the extent possible, but they should also reflect long-term future trends rather than give undue weight to recent past experience.
- (ii) The actuary should consider the impact of inflation in selecting the actuarial assumptions to be used.
- (iii) The actuary should give consideration to the reasonableness of each actuarial assumption independently as well as the combined impact of all the assumptions.
- (iv) The actuary should give careful attention to changes in plan design that may significantly alter expected future experience. For example, a liberalization of early retirement benefits may make advisable a revision in the retirement assumption.
- (v) The actuary, in choosing assumptions, should take into account general or specific information available from other sources, including the plan sponsor, plan administrator, investment managers, accountants, economists, etc.

The purpose of this Report is to provide the information necessary to decide on the appropriate assumptions to be used in future valuations. It should be noted that these decisions cannot be made "in a vacuum" but must reflect the present and expected situation within the State and the Plan.

The balance of this Report deals in detail with the various assumptions. In each area we have made recommendations as to what we believe are appropriate assumptions. These recommendations reflect our "best estimate" of the likely future experience based on:

- (a) the recent past experience,
- (b) the general economic views prevailing at this time, and
- (c) anticipated trends.

## II. Post-Retirement Mortality Rates

During the five-year period of this study, there were two retiree deaths. The expectation under the current mortality assumption was about three. This is summarized in Table 1 of Appendix I.

This small set of experience data does not constitute statistically credible experience; thus, we will not use it to establish a mortality assumption. Instead, we can examine the assumption used by the Employees' Retirement System of Rhode Island (ERSRI), which covers similar employees, and is sufficiently large to have statistically credible experience. This assumption is as follows:

- For male annuitants, 115% of the RP-2000 Combined Table for Healthy Males with White Collar adjustments, projected generationally with Scale AA from 2000.
- For female annuitants, 95% of RP-2000 Combined Table for Healthy Females with White Collar adjustments, projected generationally with Scale AA from 2000.

This assumption was reviewed in a recent (2014) experience study performed for ERSRI and found to be appropriate for continued use for that system.

# III. Economic Assumptions

## Interest Rate

The present interest assumption used in the funding of the Plan is 7.75% per year. Over the five years covered by the study, the annual rates of return earned on the assets of the Plan have fluctuated widely, as shown below:

Fiscal year ending in	Approximate rate of return
2010	53.7%
2011	11.2%
2012	6.8%
2013	17.5%
2014	17.7%

### III. Economic Assumptions (continued)

However, the focus of the analysis here is most appropriately directed to the expected future return on the assets held by the Plan. In an effort to forecast the expected long-term rate of return on Plan assets, we use a capital market model known as GEMS (General Economy and Market Simulator, described in more detail in Appendix III), in which individual asset class returns are estimated under a wide variety of simulated economic environments based on their underlying relationships to key economic variables, and then incorporated into a forecast of the performance of a portfolio invested in accordance with the Plan's present asset allocation. The model is calibrated to current economic and market conditions, and trends to a state of equilibrium. Over a 30- year period, the 50th percentile annual rate of return forecast for such a portfolio is approximately 10.94%. The 75<sup>th</sup> and 25<sup>th</sup> percentiles of the distributions of annual rate of return forecasts over 30 years are 10.94% and 7.67%, respectively. On the basis of these results, and bearing in mind the volatility of returns observed in the recent past as well as the dispersion in forecasted future returns, we recommend that the rate of return assumption used in the valuation be maintained at 7.75% per year.

#### Inflation Rate

The 50<sup>th</sup> percentile 30-year projection of inflation from GEMS is 3.01%. This is consistent with the rate of return assumptions developed here and suggests that setting the inflation assumption at 3.00% would be reasonable.

## IV. Cost Analysis and Conclusions

To assist in the selection and approval of the final package of valuation assumptions to be used prospectively from July 1, 2015, we have recalculated the results of the valuation of the Plan as of July 1, 2014, to reflect the potential impact of the adoption of the recommended change to the assumptions, which is to replace the RP-2000 Mortality Table with projections specified by IRS Regulation 1.430(h)(3)-1, as applicable to the valuation year using a combined static table for both annuitants and non-annuitants, with the following:

1. For male annuitants, 115% of the RP-2000 Combined Table for Healthy Males with White Collar adjustments, projected generationally with Scale AA from 2000.
2. For female annuitants, 95% of RP-2000 Combined Table for Healthy Females with White Collar adjustments, projected generationally with Scale AA from 2000.

Based on the revised valuation the recommended Town contribution for the year beginning July 1, 2014, would have increased from \$2,079,553 to \$2,111,480. These results are summarized in Appendix II.

We would be pleased to discuss the results of this experience investigation with the Board prior to the preparation of the July 1, 2015 valuation of the Plan.

# Appendix I: Actual and Expected Experience

Table 1: Summary of Mortality Experience of Pensioners

Group	Actual	Expected	Ratio of Actual To Expected
Service Retirees	2	2.92	0.685
Disability Retirees	0	0.04	0.000
Dependents of Deceased Members	0	0.24	0.000
Total	2	3.20	0.625

## Appendix II: Comparative Valuation Results

Results for the Actuarial Valuation Prepared as of July 1, 2014,  
on Current and Recommended Assumptions

Item	Current Assumptions	Recommended Assumptions
1. Accrued Liabilities:		
Active and Members	\$ 0	\$ 0
Retired Members, Beneficiaries and Members Entitled to Deferred Vested Benefits	<u>25,174,686</u>	<u>25,472,781</u>
Total	25,174,686	25,472,781
2. Assets	5,942,754	5,942,754
3. Unfunded Actuarial Accrued Liability	\$ 19,231,932	\$ 19,530,027
4. 16-year Amortization of Unfunded Actuarial Liability	\$ 1,984,371	\$ 2,015,128
5. Normal Contribution	\$ 0	\$ 0
6. Expected Expenses	\$ 19,000	\$ 19,000
7. Adjustment for interest to mid-year	<u>\$ 76,182</u>	<u>\$ 77,352</u>
Total Recommended Contribution = (4) + (5) + (6) +(7)	\$ 2,079,553	\$ 2,111,480

## Appendix III: About GEMS

### About GEMS (General Economy and Market Simulator)

GEMS<sup>®</sup> is a cutting-edge Economic Scenario Generator (ESG) that enables users to simulate future states of the global economy and financial markets, including the pricing of derivatives and alternative assets. It uses financial models that are the most technologically advanced in the industry, ensuring that models perform consistently with history, provide a realistic representation of extreme events and support hedging strategies with market consistent pricing. GEMS includes comprehensive yield curve modeling and a multifactor arbitrage pricing model that develops asset-class return series based on asset-class relationships to underlying economic and capital market variables such as GDP, inflation, interest rates, credit spreads, and unemployment. The model is calibrated to current market conditions and trends the economic variables to longer-term historical norms – simulating a variety of economic environments and concomitant asset-class returns in the process.

Some of the other distinguishing features of GEMS are:

1. Many asset-class return distributions are non-normal even though many models historically have treated them as such. Asset classes exhibit non-normal return distribution characteristics such as skew and kurtosis. GEMS is more effective at capturing these characteristics. In doing so, it more effectively captures outlier fat-tail events (leptokurtosis) and positive or negative skew in a manner that more closely resembles what actually occurs.
2. Asset-class returns are linked to underlying economic conditions in the model so the user can relate a specific asset-class or portfolio return path to conditions that can be described in terms of economic variables.
3. Because GEMS is calibrated to current levels of economic activity and trends to a longer-term state of equilibrium, shorter-term asset returns forecasts in GEMS are more reflective of recent market activity and short-term characteristics and trends in economic and market variables, and longer-term returns reflect asset performance over complete market cycles.
4. There is empirical evidence that asset correlations are dynamic and move closer to unity when markets are volatile and under stress. GEMS models asset correlations dynamically.