

**REPORT ON THE RESULTS OF AN  
EXPERIENCE STUDY OF THE  
RETIREMENT PLAN FOR FORMER EMPLOYEES OF THE POLICE DEPARTMENT OF  
THE TOWN OF SMITHFIELD**

**COVERING THE PERIOD JULY 1, 2006 THROUGH JUNE 30, 2011**

March 21, 2011

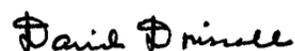
Mr. Randy R. Rossi  
Finance Director  
Town of Smithfield  
64 Farnum Pike  
Smithfield, RI 02917

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, 2011, 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,



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

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
I Introduction.....	1
II Post-Retirement Mortality Rates .....	3
III Economic Assumptions.....	4
IV Cost Analysis and Conclusion .....	5

### Appendix

I Actual and Expected Experience .....	6
II Comparative Valuation Results .....	8
III About GEMS .....	10

## **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 actuarial assumptions are:

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

Since this plan covers only retirees and their beneficiaries, only the latter two items 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 Town 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 three retiree deaths. The expectation under the current mortality assumption was about three. This is summarized in Table 1 of Appendix I.

This result indicates that the current assumption matches current experience about as closely as possible in a group of this size. The current assumption consists of the table prescribed for use by the Internal Revenue Service in the valuation of private-sector plans and is updated annually. Continued use of this table seems advisable in view of its fit with recent experience and the annual update, which is consistent with the need under the current version of Actuarial Standard of Practice No. 35 to incorporate a provision for expected future improvement in longevity in the mortality assumption.

### **III. ECONOMIC ASSUMPTIONS**

#### *Interest Rate*

The present interest assumption used in the funding of the Plan is 8.50% per year.

In view of recent changes in the investment arrangements made for the Plan, the focus of the analysis here is most appropriately on 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 7.75%. We recommend that the rate of return assumption used in the valuation be changed to 7.75% per year.

#### **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, 2011, we have recalculated the results of the valuation of the Plan as of July 1, 2011, to reflect the potential impact of the recommended assumptions.

Based on the revised valuation the recommended Town contribution for the year beginning July 1, 2011, would have increased from \$1,894,932 to \$1,988,399. 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, 2012, valuation of the Plan.

**APPENDIX I**

**ACTUAL AND EXPECTED EXPERIENCE**

**TABLE 1**  
**SUMMARY OF MORTALITY EXPERIENCE**  
**OF PENSIONERS**

<b>Group</b>	<b>Actual</b>	<b>Expected</b>	<b>Ratio of Actual To Expected</b>
Service Retirees	3	2.46	1.220
Disability Retirees	0	0.07	0.000
Dependents of Deceased Members	0	0.05	0.000
Total	3	2.58	1.163

**APPENDIX II**

**COMPARATIVE VALUATION RESULTS**

**RESULTS FOR THE ACTUARIAL VALUATION  
PREPARED AS OF JULY 1, 2011, 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>22,525,995</u>	<u>24,402,748</u>
Total	\$ 22,525,995	\$ 24,402,748
2. Assets	4,524,755	4,524,755
3. Unfunded Actuarial Accrued Liability	\$ 18,001,240	\$ 19,877,993
4. 19-year Amortization of Unfunded Actuarial Liability	\$ 1,790,193	\$ 1,886,556
5. Expected Expenses	29,000	29,000
6. Adjustment for interest to mid-year	<u>75,739</u>	<u>72,843</u>
7. Total Recommended Contribution = (4) + (5) + (6)	\$ 1,894,932	\$ 1,988,399

**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.