USI
CONSULTING GROUP

A Mortality Assumption Experience Study

For:
City of Woonsocket
Rhode Island
Policemen's Pension Fund
Firemen's Pension Fund

Prepared by:
The USI Consulting Group

As of:
April 3, 2012

The purpose of this report is to present the results of an Experience Study of the mortality assumptions utilized to calculate the liabilities of the Woonsocket Firemen's and Policemen's Pension Fund . The Study is completed by comparing the mortality assumption in use to actual experience over the past eight years to evaluate its appropriateness. Before presenting the results, a discussion of the proper context of such a Study is worthwhile.

The ultimate cost of a pension plan is determined by the level of benefits provided, the group of participants who will receive the benefits, and the experience of the plan. The annual valuation process represents a structure and discipline whereby the costs of the pension plan are projected and estimated using assumptions intended to accurately predict those costs. The trend of the funded statuses of the plan and any annual contributions can then be analyzed.

The "experience" of the plan refers to results that affect the amount and timing of development of the plan's assets and liabilities. For example, large investment earnings will reduce the contributions otherwise required by the plan. Participants who die soon after retirement tend to decrease plan costs. On the other hand, people who live to be 100 years old will increase plan costs beyond what was expected.

The assumptions used to determine the financial health of a defined benefit plan and the contributions required to fund its future are set using a future expectation that is primarily based on and/or consistent with historical results of the plan. At plan inception, no history is available so assumptions are set based on experience of similar plans or information that may describe some actual or expected experience of the covered group.

Assumptions should not be changed often because they are intended to reflect long-term results and the ongoing nature of the plan. On the other hand, the assumption set should be reviewed periodically to be sure each component is still appropriate. Judgment must be used to determine whether past experience is credible and should be reflected into the future or perhaps only an aberration. The assumption set requires ongoing attention and slow evolution will reflect the consistent and significant trend of actual experience.

One final observation is that assumptions tend to be a bit conservative. We have an overall belief that if assumptions prove to be incorrect (as they surely will), it is better that they are too conservative instead of jeopardizing the solvency of the plan and its benefits.

<u>Mortality</u>

The mortality table assumption determines the expected number of deaths that a group will incur in any year. The actual number of deaths is compared to the expected. If the actual number of deaths is greater, then liability is less than expected and a mortality gain has occurred. If fewer deaths occur, then liability is greater than expected and a loss has occurred.

The mortality table for all lives is the 1994 GAM Static Table, set forward one year for males, as dictated by the bond issue's enabling legislation.   This table was put in place beginning with the 7/1/2008 – 6/30/2009 plan year. Prior to this change, the mortality table in use was the 1971 GAM table. The 1994 GAM table, compared to the 1971 GAM table, reflects overall improvement in mortality by the general population.   However, use of these generalized tables cannot apply to all groups of persons or employees equally. The nature of police and firefighter work generally and widely results in higher mortality rates for these occupations. The 1994 GAM rates at sample ages are:

	Mortality Rate	
Age	Males	Females
30	0.082%	0.035%
40	0.116%	0.071%
50	0.287%	0.143%
55	0.495%	0.229%
60	0.899%	0.444%
65	1.624%	0.864%
70	2.595%	1.373%
75	4.086%	2.269%

Among active lives, the actual and expected numbers of deaths are as follows:

	Fire	
Year	Actual	Expected
7/1/2003 – 6/30/2004	0	0.15
7/1/2004 – 6/30/2005	0	0.15
7/1/2005 – 6/30/2006	0	0.12
7/1/2006 – 6/30/2007	0	0.12
7/1/2007 – 6/30/2008	0	0.10
7/1/2008 – 6/30/2009	0	0.05
7/1/2009 – 6/30/2010	0	0.03
7/1/2010 – 6/30/2011	0	0.02

The number of active lives is so small that these results are not meaningful.

The numbers of retired lives are much greater, allowing for more meaningful results. Among retired lives, the actual and expected numbers of deaths are as follows:

| | Fire | | Police | |
Year	Actual	Expected	Actual	Expected
7/1/2003 – 6/30/2004	2	3.63	5	3.17
7/1/2004 – 6/30/2005	7	4.17	6	3.08
7/1/2005 – 6/30/2006	8	3.86	5	3.42
7/1/2006 – 6/30/2007	8	3.74	4	3.32
7/1/2007 – 6/30/2008	10	3.73	6	3.60
7/1/2008 – 6/30/2009	1	2.68	4	2.75
7/1/2009 – 6/30/2010	10	2.87	2	2.69
7/1/2010 – 6/30/2011	4	2.81	7	2.93

The expected and actual numbers of deaths for the aggregate group (fire and police, retired and non-retired lives) are as follows:

Year	Actual	Expected
7/1/2003 – 6/30/2004	7	6.95
7/1/2004 – 6/30/2005	13	7.40
7/1/2005 – 6/30/2006	13	7.40
7/1/2006 – 6/30/2007	12	7.18
7/1/2007 – 6/30/2008	16	7.43
7/1/2008 – 6/30/2009	5	5.47
7/1/2009 – 6/30/2010	12	5.59
7/1/2010 – 6/30/2011	11	5.75

It may be helpful to graphically compare the expected aggregate rate of death to the actual aggregate rate of death. The expected death rate remains relatively constant over time. The drop in the expected death rate occurring between 2007 and 2008 is due to a change in the mortality assumption from the 1971 GAM table to the 1994 GAM table. The actual death rate has been consistently greater than the expected death rate, implying that the mortality table in use may be too conservative.
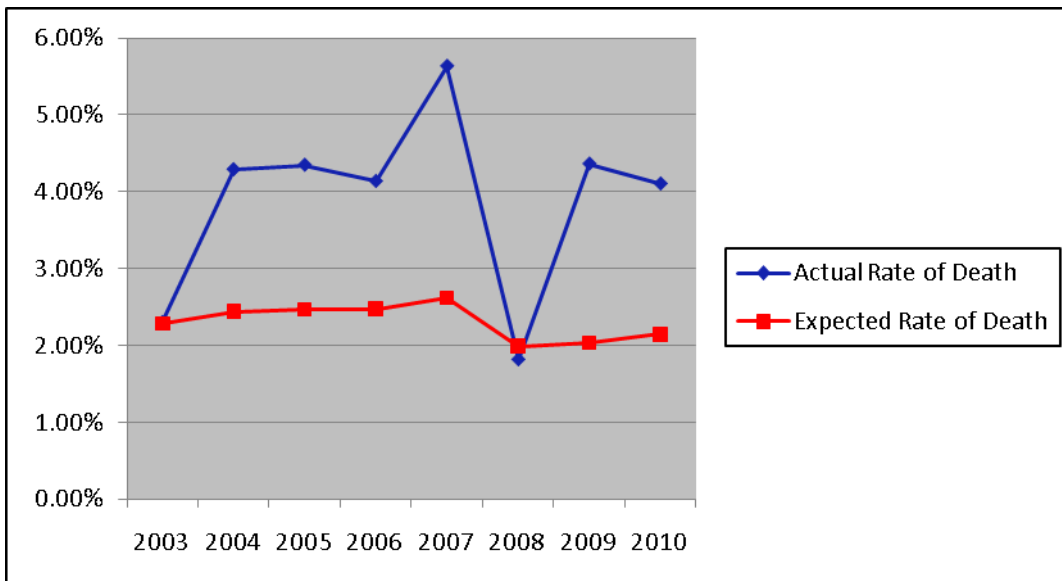
Note that this evidence strongly suggests that even the older 1971 GAM table assumes deaths that are lower than this group's actual experience. Continued use of the 1994 GAM table results in liability amounts that are about 6% higher than amounts using the 1971 GAM, which itself could be too conservative.

Over the last eight years, the mortality assumption has generated an aggregate financial gain of approximately $6.2 million. It seems likely that continued use of the 1994 GAM table will generate annual gains of similar magnitude, or about $800,000 per year. The Funds' liability as of 7/1/11 using the current 1994 GAM mortality table is $102,486,401. The liability re-calculated using the previous mortality table (1971 GAM) is $96,775,332. Based on the mortality experience, use of this mortality table would still generate experience gains, though smaller than the current table would generate.

In summary, the mortality experience of this participant group reflects significantly more deaths than expected. Adoption of the 1994 GAM table increased the difference between actual and assumed mortality. This is strong evidence that the mortality table used to value the Funds' liability is too conservative and increases the calculated liability unnecessarily. Use of a table that could be more realistic than even the previously used 1971 GAM table could easily be justified, reducing the calculated liability below the amount based on use of the 1971 GAM table. For example, if we compare the group's actual experience to the even less conservative UP84 mortality table, we still find the group's actual rate of death to be greater than the expected rate of death. This implies that we could be using a liability that is at least 10% less than the liability generated using the 1994 GAM table.

The next step in the process, if appropriate and allowable, could be to identify a mortality table that is better suited to the experience of this participant group. This process could also consider separate use of a more conservative table for the growing beneficiary population that likely would not exhibit the same experience as the retiree group.