

City of Rockville

Actuarial Experience Study 2006-2010 Plan Years

November 8, 2011

HayGroup[®]



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Executive Summary

Pension plan funding has the goal of ensuring sufficient assets are on hand to pay benefits when due – even when the benefits are payable in sixty or more years in the future. To evaluate whether the funding is on track, plan sponsors should periodically evaluate the assumptions used in the valuation.

The City of Rockville (“the City”) charged Hay Group with conducting an evaluation of the experience of The City of Rockville Employees Retirement System (ROCKERS) over the past five years, and based on that analysis setting out recommendations for actuarial assumptions to be used in future valuations.

Based on our study of the demographic and economic assumptions and the actual experience of active participants in Rockers, we recommend a number of proposed changes to the Plans’ demographic and economic assumptions.

Demographic Assumptions

In brief, the changes in demographic assumptions reflect **later retirements** for the Administrative (Admin) and Union employees (enrolled in either the Thrift or Defined Benefit (DB) plans) and **later retirement** rates for the Police employees. Active employees are expected to **terminate at a lower rate** under the proposed assumptions as compared to the current assumptions.

The termination rates were changed from age and service based rates to rates based on completed years of service. These rates were developed after the analysis of the withdrawal experience of the City’s employees over the past five years.

We are not recommending a change to the mortality rates which are based on the RP-2000 mortality table. This mortality table projects improvements in life expectancy and is an appropriate table for ROCKERS. The number of covered lives in the retirement plan is too few to develop a separate mortality table, therefore this table is appropriate.

The salary growth rates were **reduced slightly** for the employees under the **DB plan** and **increased slightly** for employees under the **Thrift plan**, and **Police plan**.

Economic Assumptions

We recommend lowering the long-term inflation assumption from 3.5% to 2.75%. Commensurate with this change, we also recommend lowering the salary growth rates by 0.75% after fitting to the last five-years’ experience. We recommend reducing the investment return assumption from 7.75% to 7.50%.

Section 1 – Introduction

Hay Group conducted a demographic and economic experience study of the City of Rockville (the City) Employees Retirement System for Admin employees, Union employees and Police employees collectively the “Plans” for the period January 1, 2006 through December 31, 2010 (the evaluation period).

The purpose of this study was to determine the reasonableness and appropriateness of the demographic and economic assumptions of the Plans and to recommend changes to those assumptions as we deemed appropriate, in consultation with the City’s Retirement Board.

As detailed in this Report we analyzed the most recent five years of data for each assumption used in the determination of the Plans’ liabilities, the Annual Required Contribution, and other actuarial analyses presented in our annual Actuarial Valuations of the Plans, and made recommendations for changes where appropriate.

The new actuarial assumptions will be used for both the City’s Defined Benefit Pension and the Retiree Benefit Trust (OPEB) valuations.

This is the first study of actuarial experience for the Plans performed by the Hay Group.

This Report formalizes our findings and recommendations to the City Retirement Board. We have included in this report our proposed assumption changes, which have utilized the proposed retirement rates in our July 1, 2011 Trust valuation and April 1, 2011 Defined Benefit Pension Plan valuation. The remaining assumptions will be used in our July 1, 2013 Trust and April 1, 2012 Defined Benefit Pension Plan valuations.

Background

For the Plans to operate on a sound actuarial basis, Plan assets together with expected future contributions must be adequate to cover the value of future promised benefit payments. Each year, as part of the actuarial valuation process, we, as the Plans’ actuary, project future benefits and determine the present value of such benefits. These projections serve as a basis for determining, as of the actuarial valuation date, each Plan’s unfunded actuarial accrued liability and the City’s normal cost.

These projections are based on numerous economic and demographic assumptions (as explained below). Since both the economic and demographic experience change over time, it is essential to conduct a periodic review of the experience and to adjust the assumptions in the valuation to reflect the most recent experience.

It is general practice to introduce some degree of conservatism in setting actuarial assumptions. However, the degree of conservatism varies widely among pension plans. Some plans set assumptions so that the pension plan contributions will be at least as great as the contributions needed in the most adverse foreseeable circumstances. Other plans set assumptions that are close to the actual experience but conservative enough to protect against small deviations from past experience. The latter, a moderately conservative approach, has been used by the Hay

Group in this study and the assumption revisions presented in this report were developed on that basis.

Section 2 of this Report describes the methodology that was used to analyze the data and develop the demographic rates. Section 3 presents the results of the analysis of the demographic experience, and the basis for the proposed demographic assumptions. Section 4 presents the results of the analysis of the economic experience, and the basis for the proposed economic assumptions. Appendix A shows the full set of rates to be used as part of the actuarial assumptions for actuarial valuations for plan years beginning on and after January 1, 2012.

We wish to thank the City staff for their cooperation and assistance in providing us with the participant census data, and answers to our questions.

Section 2 – Methodology

The specific objective of this actuarial experience study is the development of the demographic and economic assumptions, considering the experience of the Admin and Union employees separately from the Police employees, as to the expected experience of the Plans.

Demographic assumptions

Demographic assumptions include the set of rates that predict certain events occurring to a group of employees or retirees. Events of significance to a retirement system are those that result in a commencement or termination of a benefit payment. The events affecting active employees include reasons for leaving the Plans such as retirement (retirement rates), becoming disabled (disability rates), terminating service (termination rates), or death (mortality rates). The events affecting annuitants include death (post disability or post retirement). If an annuitant would return to service, or if a disabled annuitant were to recover, the benefit payments to the annuitant would stop. However, these events are not included in the analysis because the occurrences of these events are rare, and would not materially affect the calculation of the decrement rates. During our study of the evaluation period we analyzed the following demographic assumptions:

- the rates of terminations (separation from active duty for reasons other than death or disability) among active duty participants who are not eligible for retirement
- the rates of nondisabled retirements among active duty participants who are eligible for retirement

Due to the paucity of the data we did not examine emerging mortality or disability experience. Based on emerging mortality experience from other similar plans and large-scale actuarial studies of mortality we recommend no change in the mortality table of RP-2000.

Economic assumptions

The economic assumptions cover the salary growth, inflation and investment return. These relatively few assumptions, compared to the larger number of demographic assumptions, generally have the most significant effect on the value of future benefits. The following economic assumptions were reviewed as part of the experience study and adjusted to keep pace with changes in the rate of general inflation.

- the salary growth rates specific for the DB plan,
- the salary growth rates specific for the Thrift plan
- the salary growth rates specific for the Police plan

Development of the assumptions begins with the analysis of actual experience over the evaluation period and a comparison to expected experience, analyzing the experience of each plan separately. Expected experience is derived by applying the current (most recent actuarial valuation) assumptions to past active duty populations for each plan. This analysis results in the calculation of the actual-to-expected ratio. The actual-to-expected ratio, which is developed

separately for each completed years of service, and in total, gives a measure of how closely the assumption predicted what actually happened. If the actual-to-expected ratio is greater than 1.0, then the actuarial assumption under-predicted; if the actual-to-expected ratio is less than 1.0, then the assumption over-predicted the number of occurrences.

The product of the analysis is a set of proposed actuarial assumptions that produce an actual-to-expected ratio closer to 1.0, based upon the Plans' actual experience and our judgment as actuaries regarding the reliability of that experience as a predictor of future experience. When an actuarial experience analysis produces an actual-to-expected ratio which is close to 1.0 (e.g., in the range of 0.9 to 1.1), it will often be viewed as a match, and no adjustment to that assumption is warranted.

The demographic assumptions were developed by analyzing the actual experience of the participants in the Plans and comparing that experience to what was expected based on the demographic assumptions currently being used in the two actuarial valuations. During the evaluation period we were provided with the annual data files by the City. These files contain a "snap-shot" of the active employees participating in each Plan as well as the retired and survivors currently receiving benefit payments. The annual files also included terminated deferred vested employees.

To determine the number of employees who left the City during the evaluation period, we matched consecutive annual files. For example, we matched the January 1, 2006 active member file to the January 1, 2007 active member file to determine who had left each plan during calendar year 2006. We repeated the process for the other 4 years and for the 5 years of data we had collected on the retired, survivor, and terminated deferred vested employees.

Overall, we found that the actuarial assumptions of the Plans warranted some relatively modest changes to better reflect a reasonable forecast of future experience based on currently available information.

Section 3 – Demographic Assumptions Analysis

Overview

The terminations from active employment for the City participants were analyzed by three categories, depending on the eligibility for plan benefits:

- Termination
- Retirement
- Mortality

Tables 1 and 2, below, compare the actual occurrences (*i.e.*, for terminations, retirements and deaths) that have occurred during the evaluation period to the expected results based on the current set of actuarial assumptions separately for each Plan. These Tables will be discussed in greater detail in the subsequent parts of this Section.

TABLE 1			
COMPARISON OF ACTUAL AND EXPECTED OCCURRENCES			
THRIFT AND DEFINED BENEFIT (DB) EMPLOYEE PLAN			
	Expected	Actual	Ratio Actual-to-Expected
Terminations	110	112	1.02
Retirement	154	34	0.22
Death	<1	1	NA

TABLE 2			
COMPARISON OF ACTUAL AND EXPECTED OCCURRENCES			
POLICE PLAN			
	Expected	Actual	Ratio Actual-to-Expected
Terminations	8	17	2.17
Retirement	10	2	0.20
Death	<1	0	NA

Based on our study, we recommend the following changes in demographic assumptions:

- Change the termination assumptions, which are currently developed based on both current age and service for all employees under the Thrift and DB plans to assumptions based on service.
- Change the current age and service based termination assumption table to a service based table for the employees in the Police plan.

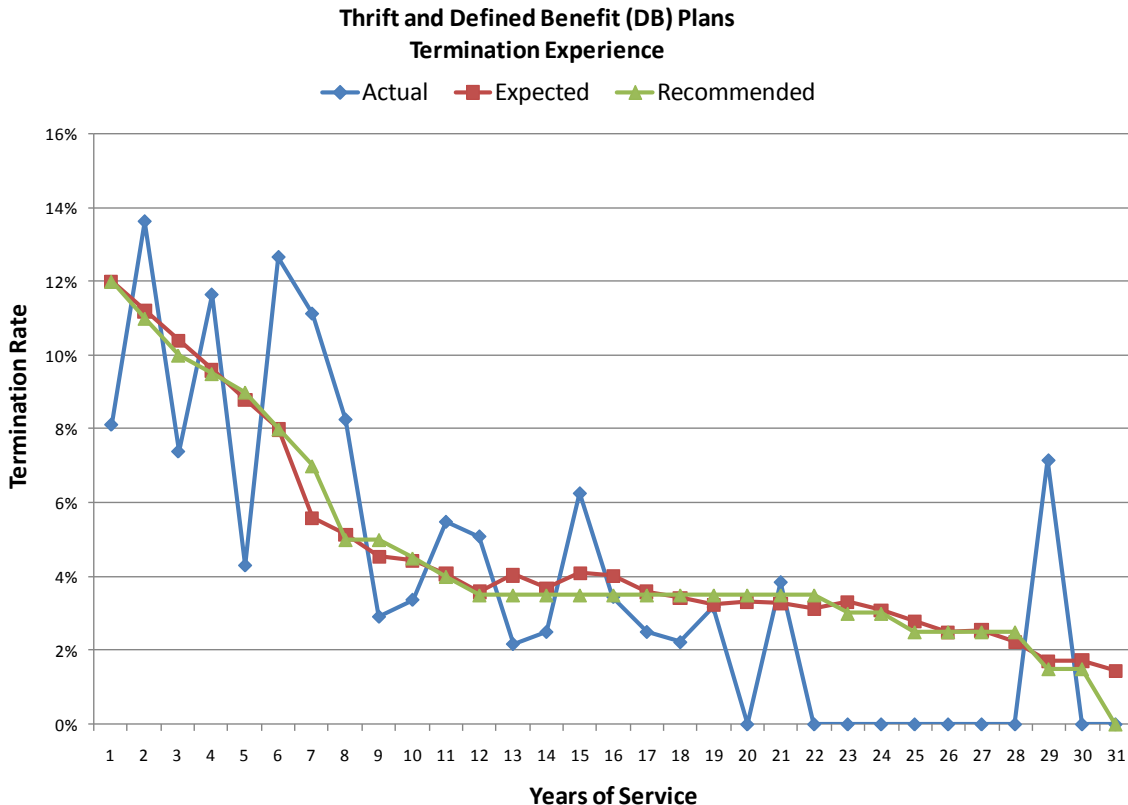
- Modify retirement assumptions for employees under the Thrift and DB plans. Move from the current assumption that the employee will retire at first eligibility to an age based table.
- Modify retirement assumptions for employees under the Police plan. Move from the current assumption, wherein employees are assumed to retire at first eligibility to an age based table.
- No change is recommended to the current mortality assumption table. We recommend continuing the RP-2000 mortality rate table to predict active employee, post-retirement and post-disability mortality.

Nondisabled Termination Assumptions

Termination is the term commonly given to separations from active duty for reasons other than retirement, disability, or death. Terminations generally include members who cease to be on active status, whether or not they have a right to receive future Plan benefits (i.e., those who withdraw may or may not be vested in a benefit). For the City’s actuarial valuation purposes, different age based termination rates are currently applied to active participants depending upon the number of years of service they have completed, ranging from zero to 6 years of service. The current assumptions are based on the V table from August 1992 Pension Forum published by Society of Actuaries adjusted by plan specific factors. The factors used to adjust the rates are 0.90 for Admin and Union Thrift employees, 0.25 for Admin DB employees and 0.25 for Police employees.

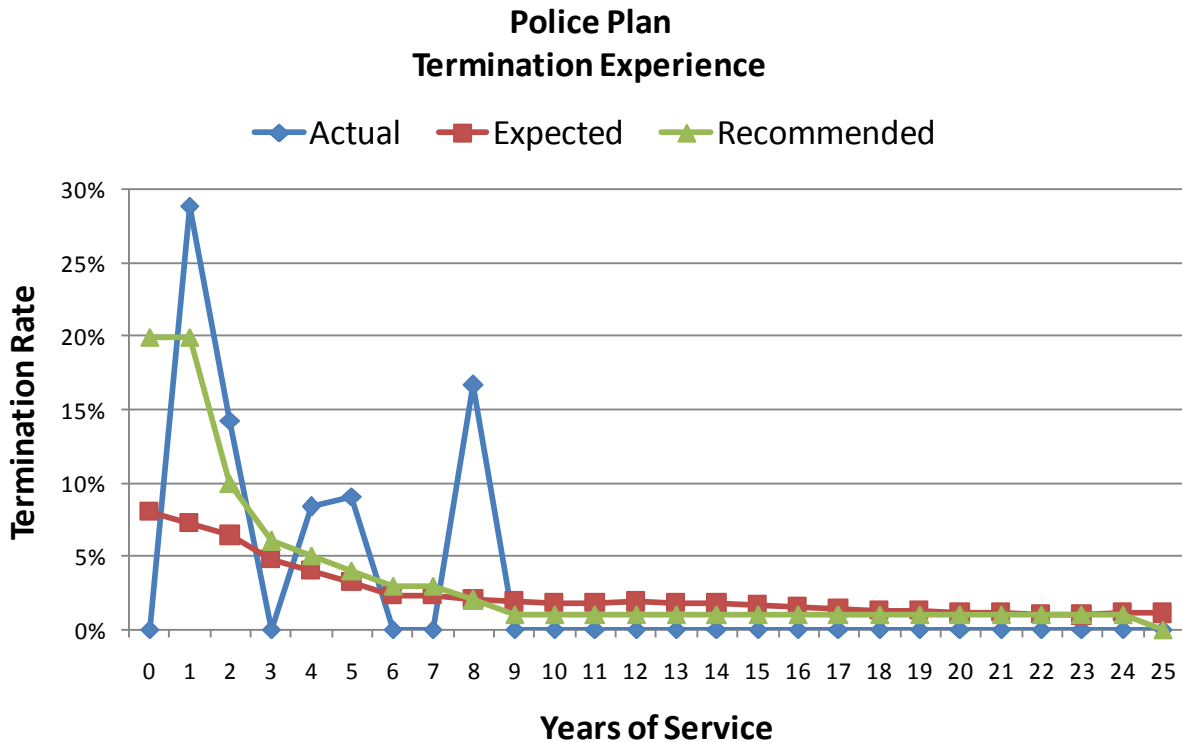
Thrift and Defined Benefit (DB) Employee Plan

Table 1, on page 6, shows that 110 employees were expected to leave during the evaluation period. During this period there were 112 actual terminations. Therefore, the actual-to-expected ratio was 102.0 percent. A ratio close to 100 percent shows the actual withdrawal experience was in line with the expected rates. The current termination assumption assumes rates that vary by attained age and completed years of service. We recommend moving to a table that predicts terminations based on completed years of service. In developing our rates we used the smoothed actual experience to develop rates producing an actual-to-expected ratio of close to 1.0. The following chart shows the comparison of the actual, expected and proposed termination rates. Detailed rates based on completed years of service can be found in the Appendix.



Police Plan

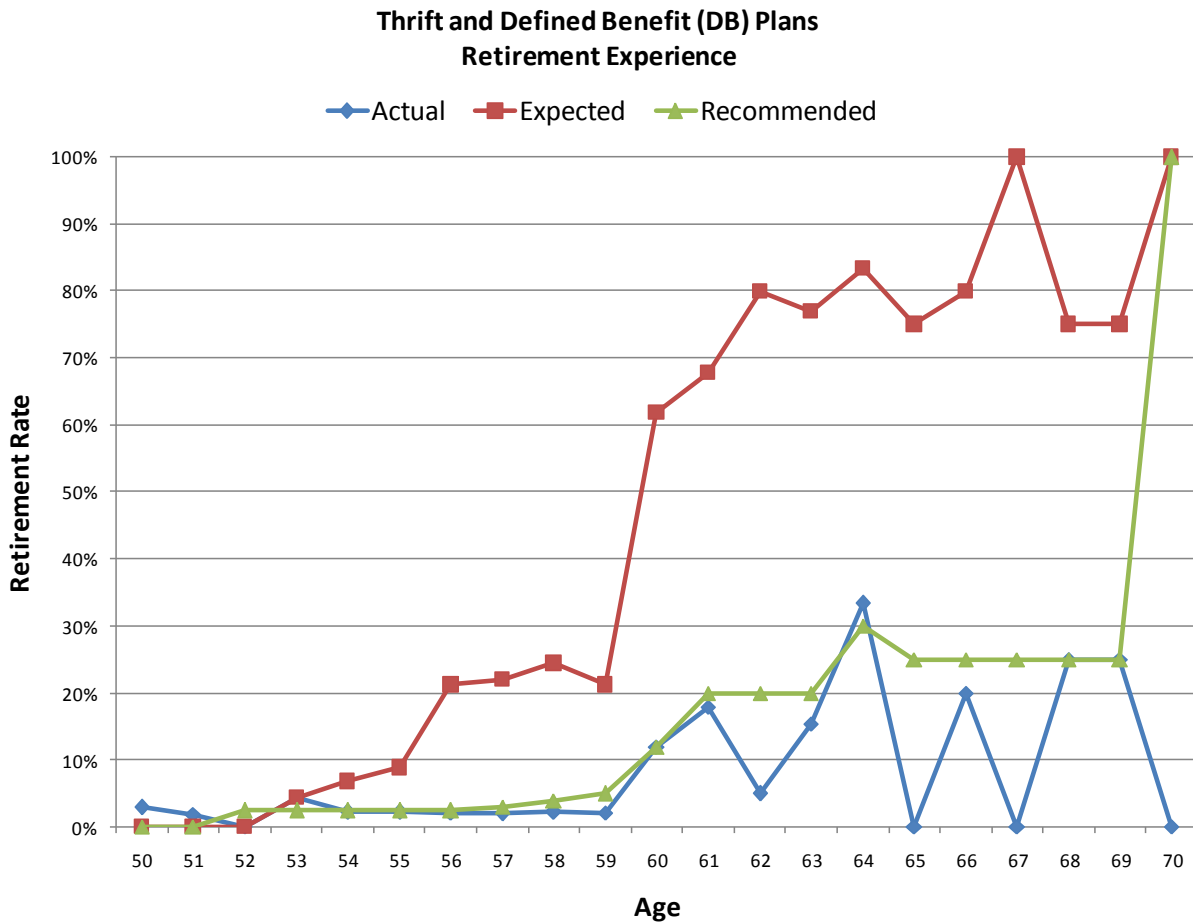
Table 2, on page 6, shows that 8 Police employees were expected to leave during the evaluation period. During this period there were 17 actual terminations. Therefore, the actual-to-expected ratio was 216.6 percent. A ratio more than 100 percent shows there were more terminations than expected. The current termination assumption assumes rates that vary by attained age and completed years of service. The actual experience shows that the current assumptions are not a good fit for the Police population. We recommend moving to a table that predicts terminations based on completed years of service. In developing our rates we used the smoothed actual experience to develop rates producing an actual-to-expected ratio of close to 1.0. The following chart shows the comparison of the actual, expected and proposed termination rates. Detailed rates based on completed years of service can be found in the Appendix.



Nondisabled Retirement Assumptions

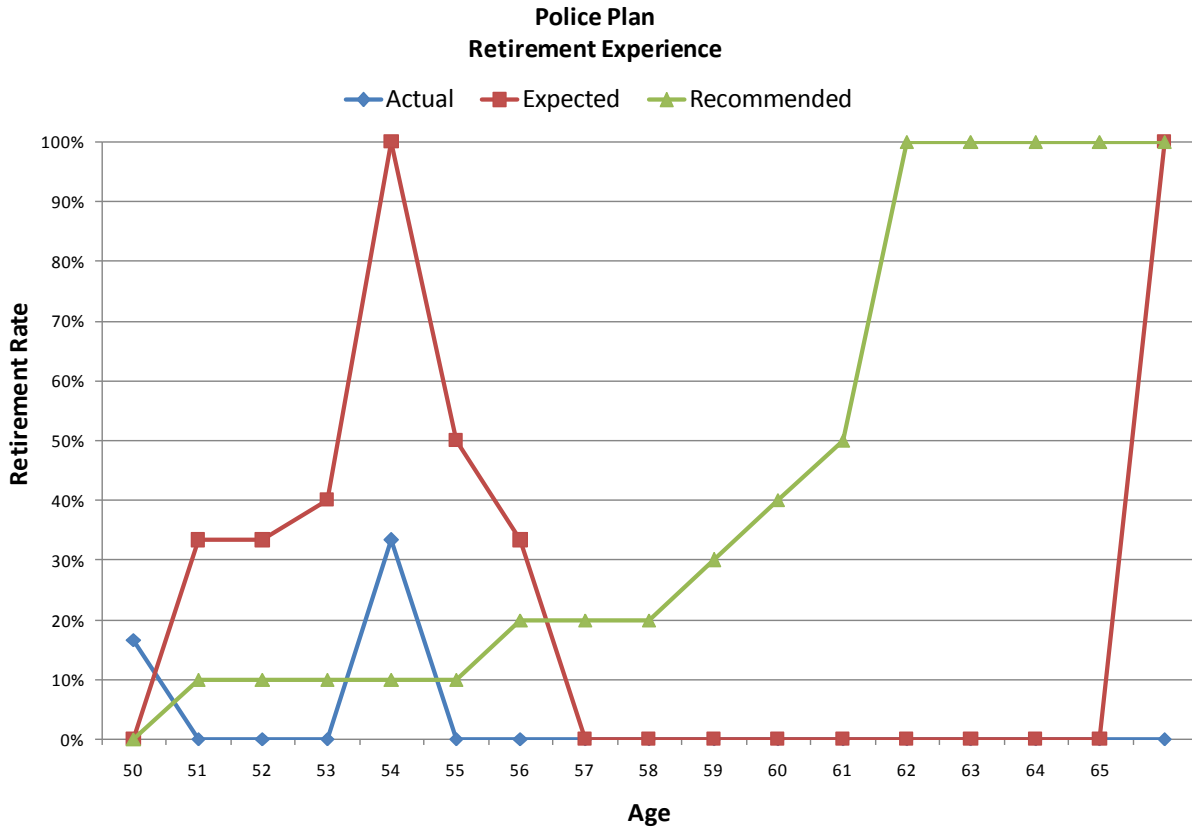
Thrift and Defined Benefit (DB) Employee Plan

Table 1, on page 6, shows that based on current assumption 154 employees were expected to retire during the evaluation period. During this period there were 34 actual retirements. Therefore, the actual-to-expected ratio was 22.1 percent. A ratio less than 100 percent shows there were fewer retirements than expected. We did a closer analysis of the distribution of retirements in the Thrift and DB employee plan, using an age-based analysis, and found lower than expected retirements for people of all ages. Based on the analysis we recommend a change from the current assumption; where a Thrift or DB employee is expected to retire at first eligibility to retirement rates that vary by attained age. All employees are expected to retire at age 70 in our recommended assumption. For the other ages we developed rates producing an actual-to-expected ratio of close to 1.0. The following chart shows the comparison of the actual, expected and proposed retirement rates. Detailed age base comparisons and rates can be found in the Appendix.



Police Plan

Table 2, on page 6, shows that 10 Police employees were expected to retire during the evaluation period. During this period there were 2 actual retirements. Therefore, the actual-to-expected ratio was 20.0 percent. A ratio less than 100 percent shows there were fewer retirements than expected. Based on the analysis we recommend a change from the current assumption; where a Police employee is expected to retire at first eligibility to retirement rates that vary by attained age. Due to the paucity of data over the study period with only 2 actual retirements and 234 exposures, we do not recommend using the City’s actual experience to develop the retirement rates for employees under the Police plan. To develop the retirement rates we supplemented the City’s data with data from employers with similar plan provisions and census characteristics. To maintain a degree of conservatism we developed rates assuming all police employees will retire at age 61. Going forwards with more emerging experience we will modify this assumption. The following chart shows the comparison of the actual and expected/proposed retirement rates. Detailed age base comparisons and rates can be found in the Appendix.



Nondisabled Mortality Assumptions

Thrift and Defined Benefit (DB) Employee and Police Employee Plan

Occurrences of death are rare and difficult to predict in a small population. The rate of death, the mortality assumption, is applied to the active population as well as the retirement population. The mortality assumption is used to predict how long the fund will be paying retirement benefits to the participants once they retire.

The recommendation of this study is to not to change the RP-2000 mortality tables being used in the prior valuations. The RP-2000 tables project a longer life expectancy, and therefore more benefit payments from the Plans thus keeping.

Disability Retirement Assumptions

Thrift and Defined Benefit (DB) Employee and Police Employee Plan

Occurrences of disability are rare and difficult to predict in a small group. Because the numbers of the study are small and hard to predict, no change in the current assumption is proposed. There has not been sufficient experience to warrant a change.

Summary of Demographic Assumption Analysis

Withdrawal Rates

Based on the analysis of the withdrawal experience the current rates were changed from the age and service based rates to completed years of service based rates for Thrift and DB employee plan, and Police employees plan.

Retirement Rates

Based on the analysis of the retirement experience the current assumption was adjusted to account for the fewer number of retirements for Thrift and DB employee plan, and Police employees plan. Age based retirement rates were developed for both the plans.

Mortality Rates

The recommendation of this study is no change to the current RP-2000 mortality table for valuations going forward for both plans.

Disability Rates

There has not been sufficient experience to warrant a change in the disability retirement rates.

Section 4 - Economic Assumption Analysis

Overview

The economic assumptions for the City participants were analyzed by the following categories:

- Salary growth rate
- Inflation rate

Based on our study, we made the following recommendations:

- Modify salary growth rate assumption for employees under the Thrift plan, employees under the Defined Benefit (DB) plan and employees under the Police plan. The proposed rates are lower for employees under the DB plan. For employees under the Thrift plan and the Police plan the proposed rates are higher.
- Lower expected inflation assumption for employees under the Thrift plan, employees under the DB plan and employees under the Police plan from current rate of 3.5 percent to 2.75 percent.

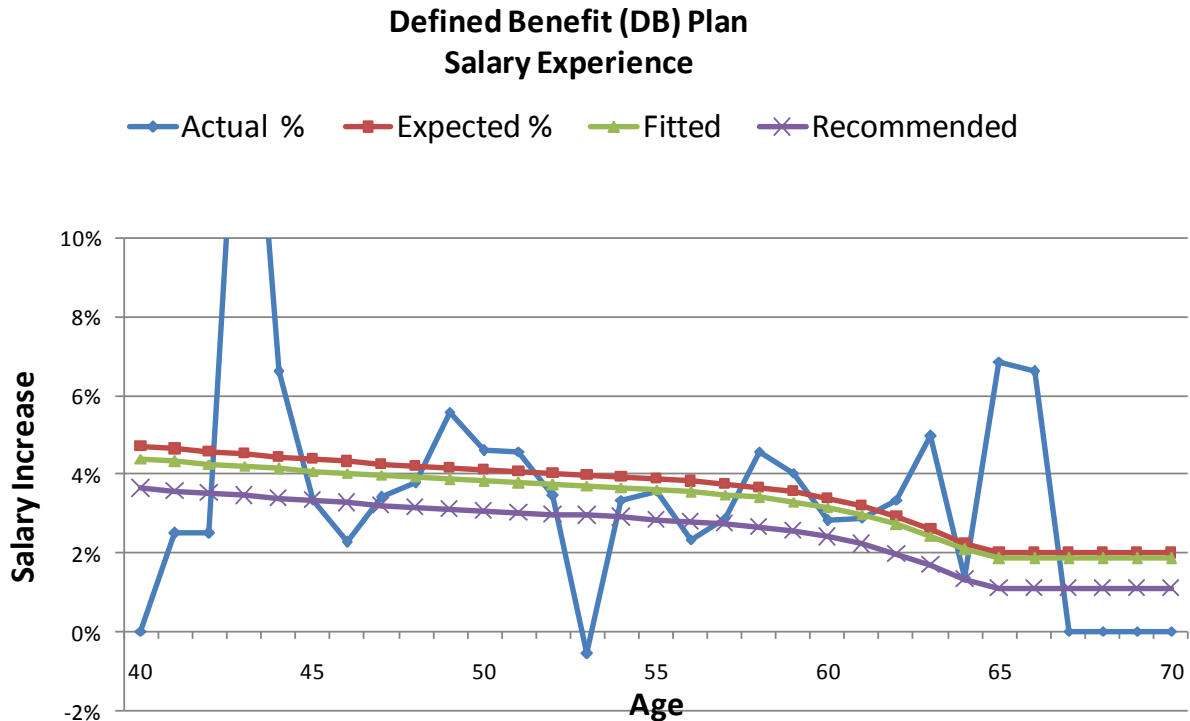
Table 3 compares the actual salary growth that has occurred during the evaluation period to the expected salary growth based on the current set of actuarial tables. This Table 3 will be explained in greater detail in the parts of this Section.

TABLE 3			
COMPARISON OF ACTUAL AND EXPECTED SALARY GROWTH RATE			
	Expected	Actual	Ratio Actual-to-Expected
DB Plan	3.82%	3.55%	0.93
Thrift Plan	5.43%	6.52%	1.20
Police Plan	5.34%	6.31%	1.18

Salary Growth Rate Assumptions

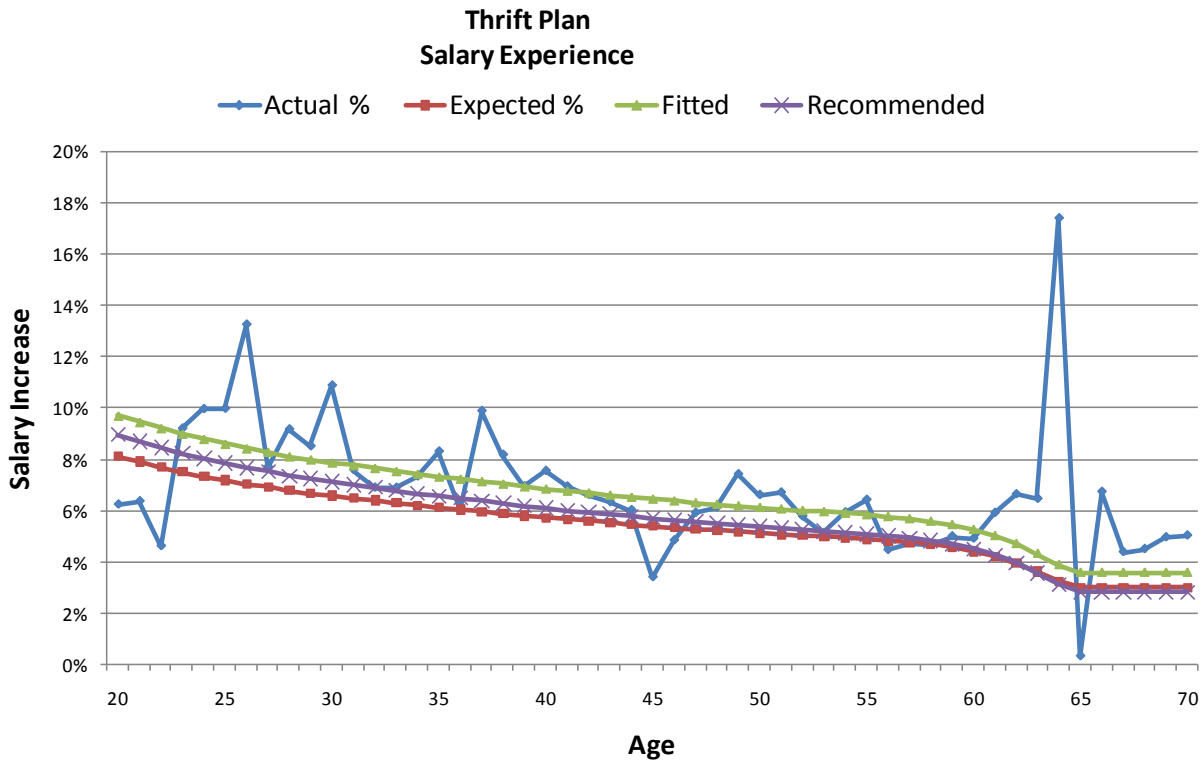
Defined Benefit (DB) Employee Plan

Table 3, shows that the salaries for DB plan employees were expected to grow at an average rate of 3.82 percent during the evaluation period. During this period the actual salary growth was around 3.55 percent. Therefore, the actual-to-expected ratio was 93.9 percent. A ratio less than 100 percent shows that the salaries for DB plan employees grew at a slower rate. A closer analysis of the distribution of salary growth in the DB employee plan shows lower than expected salary for employees of some ages and higher for employees at other ages. Multiplying the current assumption across all ages with 0.93 and producing an actual-to-expected ratio close to 1.0 we developed our recommended salary growth rates assumption to be used for the employees under the DB plan. The following chart shows the comparison of the actual, expected and proposed salary growth rates. Detailed age base comparisons and rates can be found in the Appendix.



Thrift Employee Plan

Table 3 on page 13, shows that the salaries for Thrift plan employees were expected to grow at an average rate of 5.43 percent during the evaluation period. During this period the actual salary growth was around 6.52 percent. Therefore, the actual-to-expected ratio was 120.0 percent. A ratio greater than 100 percent shows that the salaries for Thrift plan employees grew at a higher rate. A closer analysis of the distribution of salary growth in the Thrift employee plan, shows higher than expected salary for all almost all employees except employees at age 20, 21 22, 45 and 46. Multiplying the current assumption across all ages with 1.20 and producing an actual-to-expected ratio close to 1.0 we developed our recommended salary growth rates assumption to be used for the employees under the Thrift plan. The following chart shows the comparison of the actual, expected and proposed salary growth rates. Detailed age base comparisons and rates can be found in the Appendix.



Police Employee Plan

Table 3, on page 13, shows that the salaries for Police employees were expected to grow at an average rate of 5.34 percent during the evaluation period. During this period the actual salary growth was approximately 6.31 percent. Therefore, the actual-to-expected ratio was 118.1 percent. A ratio that exceeds 100 percent indicates that the salaries for Police employees grew at a higher rate than expected under current assumptions. A closer analysis of the distribution of salary growth in the Police plan, shows higher than expected salary for almost all ages. Multiplying the current assumption across all ages with 1.18 and producing an actual-to-expected ratio close to 1.0 we developed our recommended salary growth rates assumption to be used for the employees under the Police plan. The following chart shows the comparison of the actual, expected and proposed salary growth rates. Detailed age base comparisons and rates can be found in the Appendix.



Inflation Rate Assumptions

The inflation assumption is a common component of both salaries and investment return.

The most important set of rates in the valuation is the set of economic assumptions that include the prediction of future rates of investment return and general salary increases. The assumed rates of investment return and general salary increases are nominal rates and are therefore developed from an assessment of the underlying rate of inflation.

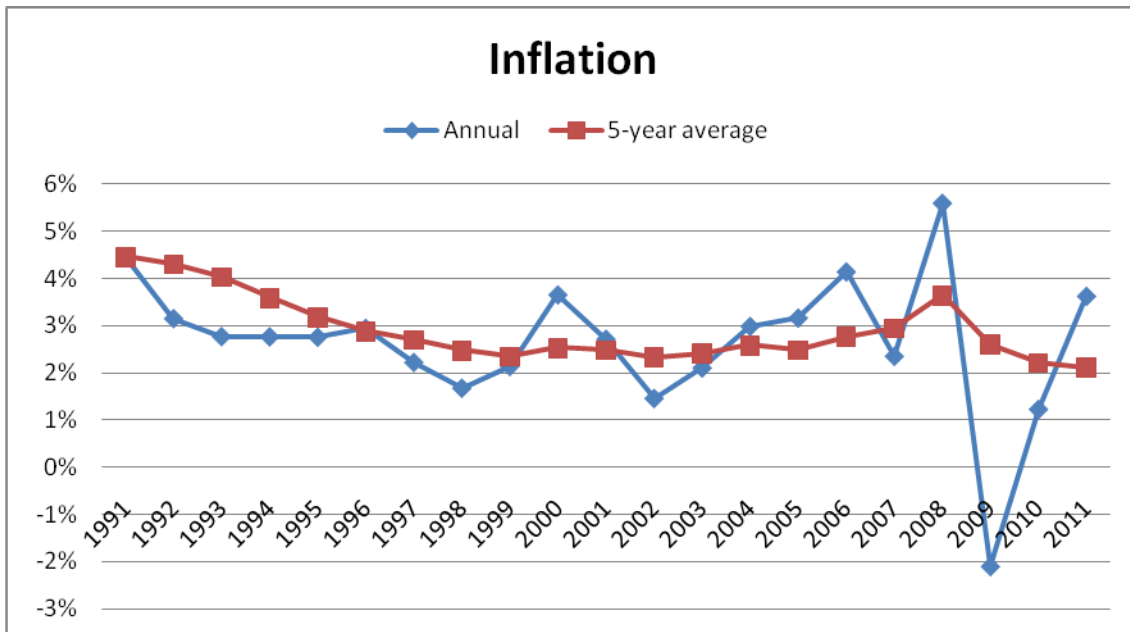
While inflation does not directly affect Rockers liabilities or assets (as it would if automatic COLAs applied), it is an important consideration in our review of both the investment return and general salary increase assumptions. There has been a gradual decline in inflation in the United

States, with the rolling five-year average staying below 3 percent for 14 of the past 15 years. The significant federal stimulus monies and expansionary monetary policies have prevented the US economy from entering a deflationary phase but are unlikely to lead to an increase in inflation in the long-term.

The Social Security Administration, for purposes of cost projections included in their most recent annual Trustees’ Reports (based upon their “intermediate assumptions”), projects that future annual inflation will be at a rate of 2.8 percent.

We believe, based upon historical inflation rates and our current expectations for the future (giving appropriate consideration to the recent stimulus, monetary policy, and supportive points covered in the prior paragraph) that it is reasonable and appropriate to recommend lowering the anticipated annual inflation assumption from 3.5 percent to 2.75 percent.

While over the last 20 years the annual inflation rate has ranged from a low of -2.1 percent to a high of 5.6 percent, the rolling 5-year average has ranged between 2.1 percent and 4.3 percent. The current five-year average is 2.11 percent and the 10-year average is 2.44 percent.



Investment Return

The historical investment performance was taken from the summary in the Segal Advisors reports for the period since inception (June 2002) to June 2011. The period of performance is only nine years and includes the extraordinarily poor return experienced in 2008/2009. The absolute annual average return over the five years to June 30, 2011 was 2.25% and the average annual real return (i.e. net of inflation) was 0.1%. Over the last nine years, the absolute annual return averaged 4.4% and the real return was 1.8%.

Year ending June 30	Market Value As of Beginning of Year	Net Cash Flow	Investment Earnings	Market Value As of End of Year	Annual Return
2003	\$41,225,900	\$0	(\$1,992,067)	\$39,233,833	-4.83%
2004	\$39,233,833	\$0	\$6,846,203	\$46,080,036	17.45%
2005	\$46,080,036	\$0	\$4,796,275	\$50,876,311	10.41%
2006	\$50,876,311	(\$398,198)	\$3,418,539	\$53,896,652	6.75%
2007	\$53,896,652	(\$324,056)	\$7,356,426	\$60,929,022	13.69%
2008	\$60,929,022	(\$580,112)	\$4,031,612	\$64,380,522	6.65%
2009	\$64,380,522	(\$1,062,417)	(\$20,327,948)	\$42,990,157	-31.84%
2010	\$42,990,157	(\$266,329)	\$7,026,529	\$49,750,357	16.40%
2010	\$49,750,357	(\$945,702)	\$7,968,507	\$56,773,162	16.17%
2011	\$56,773,162	\$3,241,316	\$3,254,887	\$63,269,365	5.57%

The investment time horizon for the pension plan is over 30 years. While the recent experience is important to review, unlike the demographic assumptions and salary increase assumption, which reflect the decisions of the City, the investment performance is driven more by outside forces and factors. The key areas of the investment return that can be affected by decisions of the Retirement Board are selection of the asset allocation policy and selection of investment managers.

The pension plan assets are invested in a diversified portfolio of asset classes. The following table shows the asset allocation policy and actual allocation as of June 30, 2011.

Asset Class	Minimum	Target	Actual	Maximum
Large Cap Equity	20%	25%	26.71%	30%
Fixed Income	20%	25%	25.30%	30%
International Equity	15%	20%	19.60%	25%
Small Cap Equity	10%	15%	17.49%	20%
Real Estate	10%	15%	10.91%	20%

The use of professional investment managers, selection of a portfolio of multiple asset classes and frequent monitoring of their performance supports a long-term real investment return in the range of 4.00% to 5.50% per year. As the plan’s funding requirements will result in limited liquidity needs in the next several years, it is reasonable to expect a real return at or above the middle of the range. We therefore recommend a real return assumption of 4.75%. This return, combined with the long-term inflation assumption of 2.75%, results in a recommended nominal investment return of 7.50%.