Milliman

RETIREMENT PLAN FOR EMPLOYEES OF THE TOWN OF PORTSMOUTH

2011 EXPERIENCE STUDY

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March 30, 2012

PERSONAL & CONFIDENTIAL

Mr. David P. Faucher
Finance / Personnel Director
Town of Portsmouth
2200 East Main Street
Portsmouth, RI 02871

Re: 2011 Experience Study – Town of Portsmouth, Rhode Island

Dear Dave:

We are pleased to present the results of the 2011 Experience Study for the Town of Portsmouth, Rhode Island.

The enclosed study reviews experience through June 30, 2011 and summarizes the results of the following economic and demographic experience: Consumer Price Inflation, Salary Scale, Payroll Growth Rate, Cost of Living Adjustment, Investment Return, Turnover, Retirement, Healthy Mortality, Disabled Mortality, Disability, and Percent Married. The following actuarial methods are also reviewed: Asset Valuation Method (Actuarial Value), and the Actuarial Cost Method. Section II contains a discussion of the economic assumptions used in the actuarial valuation. Details regarding demographic assumptions are found in Section III. Section IV reviews the actuarial methods.

Proposals for new assumptions are included in this report, as well as the estimated impact of the proposed assumptions on the funded ratio and recommended Town contribution. We believe that this report will be a useful tool for looking at past experience when reviewing these proposed assumptions. However, just as important will be any expected future experience which we will be pleased to incorporate into the final new assumptions.

In preparing this study, we relied without audit on employee census data and financial information as of each July 1, 2006 through July 1, 2011, furnished by the Town of Portsmouth. This information includes, but is not limited to, plan provisions, employee data, and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised. If there are material defects in the data, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data

values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of our assignment.

The calculations reported herein have been made on a basis consistent with our understanding of the plan provisions for the Retirement Plan for Employees of the Town of Portsmouth. Furthermore, the calculations were determined in conformance with generally recognized and accepted actuarial principles and practices, which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions, and supporting Recommendations of the American Academy of Actuaries.

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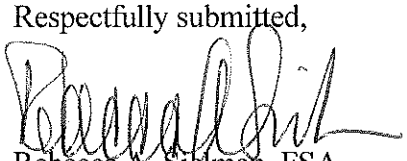
The calculations reported herein have been made on a basis consistent with our understanding of ERISA and the related sections of the tax code. Additional determinations may be needed for other purposes, such as judging benefit security at plan termination or meeting employer accounting requirements. On the basis of the foregoing, we hereby certify that, to the best of our knowledge, this report is complete and accurate and all costs and liabilities were determined in conformance with generally accepted actuarial principles and practices. We further certify that, in our opinion, each actuarial assumption, method and technique used is reasonable taking into account the experience of the Plan and reasonable expectations or would, in the aggregate, result in a total contribution equivalent to that which would be determined if each such assumption, method, or technique were reasonable. Differences between our projections and actual amounts depend on the extent to which future experience conforms to the assumptions made for this analysis. Actual experience will not conform exactly to the assumptions

made for this analysis. Actual amounts will differ from projected amounts to the extent that actual experience deviates from expected experience.
I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

I look forward to discussing this report with you. In the meantime, please call if I can be of assistance.

Respectfully submitted,



Rebecca A. Sielman, FSA
Consulting Actuary

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RETIREMENT PLAN FOR EMPLOYEES OF THE TOWN OF PORTSMOUTH 2011 EXPERIENCE STUDY

TABLE OF CONTENTS

Section		Page
	LETTER OF TRANSMITTAL	
I	EXECUTIVE SUMMARY	
	Discussion of Study Results	1
	Exhibit A - Current and Proposed Actuarial Assumptions	7
	Exhibit B - Estimated Impact of Proposed Assumptions on Funded Ratio and Annual Town Cost	11
II	ECONOMIC ASSUMPTIONS	
	A. Overview	12
	B. Consumer Price Inflation	13
	C. Salary Scale and Payroll Growth Rate	15
	D. Cost of Living Adjustment	17
	E. Investment Return	18
III	DEMOGRAPHIC ASSUMPTIONS	
	A. Turnover	25
	B. Retirement	27
	C. Healthy Mortality	31
	D. Disabled Mortality	32
	E. Disability	33
	F. Percent Married	34
IV	ACTUARIAL METHODS	
	A. Asset Valuation Method (Actuarial Value)	35
	B. Actuarial Cost Method	35
V	APPENDIX	
	Selected Economic Assumptions from the 2011 OASDI Trust Funds Annual Report (Social Security Administration, May 13, 2011)	36

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SECTION I
EXECUTIVE SUMMARY

The following is a discussion of the key findings of the 2011 Experience Study for the Retirement Plan for Employees of the Town of Portsmouth.

Consumer Price Inflation

Current Basis	3.0% per year.
Recommendation	Based on the history over the last 75 years and future expectations, we recommend that the long-term assumed price inflation rate be lowered from 3.00% to 2.75%. This rate will be used to build the net investment return, pension escalation, and salary scale assumptions.

Salary Scale

Current Basis	4.0% per year.
Comment	Experience shows that average salary increases per year from 2006 to 2011 were higher than the current basis earlier in an employee's career (on average, at younger ages), and lower than the current basis later in an employee's career (on average, at older ages).
Recommendation	Move from a flat salary scale assumption to a graded salary scale assumption. Rates at younger ages are assumed to be greater than the current basis, while rates at older ages are assumed to be lower than the current basis.

Payroll Growth Rate

Current Basis	This assumption is currently not applicable for the valuation because the amortization of the plan's unfunded actuarial liability is done on a "level dollar" basis.
Recommendation	In conjunction with a change in the amortization method to a "level percent of payroll" basis (discussed below), adopt a payroll growth rate assumption of 3.5% per year. The proposed assumption is consistent with the "ultimate" proposed rate of salary increase.

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SECTION I
EXECUTIVE SUMMARY

Cost of Living Adjustment

Current Basis	Fire, retired before 6/30/2007: 2.0% (based on 50% of the salary projection) Fire, retired after 6/30/2007: 3.0% Police: 3.0% Public Works: 2.0% (based on 50% of the salary projection) School Management and Non-Certified: 1.7% Town Management, retired before 7/1/2004: 2.0% Town Non Management: 2.0% Town Management, retired after 7/1/2004: 3.0%
Comment	Public Works members and Fire members who retired before June 30, 2007 are entitled to post-retirement benefit adjustments equal to 50% of the percentage salary increase received by active bargaining unit members in the department from which the member retired. The 2.0% assumption is 50% of the current 4.0% salary scale assumption. For other members, the current assumption matches the applicable fixed rate cost of living adjustment.
Recommendation	No change.

Investment Return

Current Basis	8.0% per year, net of investment expenses.
Comment	Based on updated capital market assumptions (Milliman, December 2011) and your current asset mix, we propose that the investment return assumption be reduced.
Recommendation	6.75% per year, net of investment expenses. Exhibit B on page 12 also shows the estimated impact of the proposed assumptions under an alternative asset mix that would support an investment return assumption of 7.25% per year, net of investment expenses.

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SECTION I
EXECUTIVE SUMMARY

Turnover

Current Basis	Light turnover scale assumed for School, Public Works and Town employees. Slightly lighter scale used for Police and Fire employees.
Comment	Experience has been relatively on target.
Recommendation	No change.

Retirement

Current Basis	Employees are assumed to retire as follows: Fire: 100% at 27 years of service. Police: 50% at 25 years of service and the remainder at 27 years of service. Town and Public Works: 100% at the later of age 60 or 10 years of service. School (Council #94): 50% on completion of age 55 and 20 years of service, 100% at age 60 with 10 years and 5% between age 56-59. School (Non-Council #94): 100% on completion of age 60 with 10 years of service. Any employee who has already passed the Assumed Retirement Age is assumed to retire immediately.
Comment	For Police and Fire, experience indicates that members are retiring generally earlier than assumed under the current basis. For all other groups, experience indicates that members are retiring at generally later ages than assumed under the current basis.
Recommendation	For Police and Fire, retirement rates based on length of service, as shown below. For all others, retirement rates based on age, as shown below.

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SECTION I
EXECUTIVE SUMMARY

Service	Police	Fire
20	25%	20%
21	15	10
22	5	10
23	5	10
24	5	10
25	50	10
26	50	10
27	50	30
28	50	30
29	50	30
30	100	100

Age	School	Town Mgmt & Public Works	Town Non-Mgmt
55	2%	5%	
56	2	5	
57	2	5	
58	2	5	
59	2	5	
60	30	10	10%
61	5	10	10
62	35	15	15
63	35	15	15
64	10	15	15
65	10	50	50
66	10	50	50
67	10	100	100
68	30		
69	30		
70	100		

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SECTION I
EXECUTIVE SUMMARY

Healthy Mortality

Current Basis	RP-2000 Combined Healthy Mortality Table for males and females with mortality projection to 2010 with Scale AA. Pre-retirement mortality rates for Fire and Police are assumed to be 110% of these rates.
Comment	Experience indicates that mortality has been generally consistent with the current assumption.
Recommendation	The mortality table should be updated and should provide a margin for future mortality improvement. We recommend that the mortality assumption continue to be the RP-2000 Combined Healthy Mortality Table, but with generational projection per Scale AA. The RP-2000 mortality table is the table recommended by the Society of Actuaries Retirement Plan Experience Committee (RPEC), and generational projection is consistent with the RPEC's recommendation that "pension valuations should take trends in long-term mortality improvement into account."

Disabled Mortality

Current Basis	Unpublished OASDI table of 1957-1966 experience, adjusted for actual experience through 1973, for ages 65 and under; graded into the 1951 Group Annuity projected to 1975 non-disabled life mortality, for ages 85 and over.
Recommendation	We recommend moving to the RP-2000 Disabled Mortality Table.

Disability

Current Basis	Police/Firefighters: 160% of the 1968-1972 Group LTD experience, excluding very large cases, published by the Society of Actuaries. 50% of disabilities are assumed to be ordinary and 50% are assumed to be work related. School/Public Works/Town: 100% of the 1968-1972 Group LTD experience, excluding very large cases, published by the Society of Actuaries.
Recommendation	We recommend moving to a more recent table for both groups:

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SECTION I
EXECUTIVE SUMMARY

	Police/Firefighters: 50% of the 1985 Pension Disability Table (DP-85 Table) Class 4. 50% of disabilities are assumed to be ordinary and 50% are assumed to be work related.
	School/Public Works/Town: 50% of the 1985 Pension Disability Table (DP-85 Table) Class 1.

Percent Married

Current Basis	80% of active members are assumed to be married at retirement, with husbands 3 years older than their spouses.
Comment	Experience indicates that a slightly higher percentage of retirees are married than under the current basis.
Recommendation	85% of active members are assumed to be married at retirement, with husbands 3 years older than their spouses.

Asset Valuation Method (Actuarial Value)

Current Basis	You are using a smoothing method which phases in recognition of the difference between the actual return on market value and the expected return on market value over a five-year period at 20% per year.
Recommendation	We recommend the continued use of this method.

Actuarial Cost Method

Current Basis	The current method is the Entry Age Normal Cost Method. It is used in determining the contributions required for funding future benefits by determining two pieces: the Normal Cost of each individual's benefit accrued during the year and any prior service costs amortized as a level dollar amount over a 28 year period (starting July 1, 2009). This amortization period will decline by one year until it reaches 10 years, after which it will remain at 10 years.
Recommendation	We recommend the continued use of this funding method. However, we also recommend changing to a "level percent of payroll" amortization of any prior service costs. This recommended approach is designed to produce an Annual Required Contribution which will remain stable as a percentage of payroll as long as the average entry age of the group remains stable.

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SECTION I

EXHIBIT A - CURRENT AND PROPOSED ACTUARIAL ASSUMPTIONS

The current actuarial assumptions used in the 2011 Retirement Plan for Employees of the Town of Portsmouth valuation plus the proposed changes in actuarial assumption are compared as follows:

	Current Assumption	Proposed Assumption
Consumer Price Inflation	3.00% per year.	2.75% per year.
Salary Scale	4.00% per year.*	Age / Rate*
	*Includes 3.00% for inflation	25 6.50% 30 5.00% 35 4.50% 40 4.25% 45 4.00% 50 3.75% 55+ 3.50%
		*Includes 2.75% for inflation
Payroll Growth Rate	Not applicable.	3.50% per year.
Cost of Living Adjustment		
Fire	Retired before 6/30/2007: 2.0% (based on 50% of salary projection)	No change.
	Retired after 6/30/2007: 3.0%	No change.
Police	3.0%	No change.
Public Works	2.0% (based on 50% of salary projection)	No change.
School	1.7%	No change.
Town	Management retired before 7/1/2004: 2.0%	No change.
	Management retired after 7/1/2004: 3.0%	No change.
	Non-Management: 2.0%	No change.
Investment Return	8.00% per year, net of investment expenses	6.75% per year, net of investment expenses (based on current policy asset mix). Exhibit B on page 12 also shows the estimated impact of the proposed assumptions under an alternative asset mix that would support an investment return assumption of 7.25% per year, net of investment expenses.

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SECTION I

EXHIBIT A - CURRENT AND PROPOSED ACTUARIAL ASSUMPTIONS

Turnover

Current Assumption

Police and Fire:

Age	Male	Female
25	6.87%	9.87%
30	4.87%	6.87%
35	3.87%	4.87%
40	2.65%	3.65%
45	1.50%	2.50%
50	0.16%	1.16%
55	0.00%	0.00%
60>	0.00%	0.00%

School, Public Works and Town:

Age	Male	Female
25	6.92%	9.92%
30	4.92%	6.92%
35	3.92%	4.92%
40	2.78%	3.78%
45	1.69%	2.69%
50	0.47%	1.47%
55	0.08%	0.08%
60>	0.00%	0.00%

Proposed Assumption

No change.

No change.

Retirement

Police: 50% at 25 years of service and the remainder at 27 years of service.

Fire: 100% at 27 years of service.

For Police and Fire, rates based on length of service:

Service	Police	Fire
20	25%	20%
21	15	10
22	5	10
23	5	10
24	5	10
25	50	10
26	50	10
27	50	30
28	50	30
29	50	30
30	100	100

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SECTION I

EXHIBIT A - CURRENT AND PROPOSED ACTUARIAL ASSUMPTIONS

	Current Assumption	Proposed Assumption
Retirement	Town and Public Works: 100% at the later of age 60 or 10 years of service. School (Council #94): 50% on completion of age 55 and 20 years of service, 100% at age 60 with 10 years and 5% between age 56-59. School (Non-Council #94): 100% on completion of age 60 with 10 years of service. Any employee who has already passed the assumed retirement age is assumed to retire immediately.	For School, Public Works and Town, rates based on age as follows:

Age	School	Town Mgmt/ Public Works	Town Non-Mgmt
55	2%	5%	
56	2	5	
57	2	5	
58	2	5	
59	2	5	
60	30	10	10%
61	5	10	10
62	35	15	15
63	35	15	15
64	10	15	15
65	10	50	50
66	10	50	50
67	10	100	100
68	30		
69	30		
70	100		

Healthy Mortality	RP-2000 Combined Healthy Mortality Table projected to 2010 per Scale AA, with separate male and female tables.	RP-2000 Combined Healthy Mortality Table with generational projection per Scale AA, with separate male and female tables.
Disabled Mortality	Unpublished OASDI table of 1957-1966 experience, adjusted for actual experience through 1973, for ages 65 and under; graded into the 1951 Group Annuity projected to 1975 non-disabled life mortality, for ages 85 and over.	RP-2000 Disabled Mortality Table, with separate male and female tables.
Disability		
Police/Firefighters	160% of the 1968-1972 Group LTD experience, excluding very large cases, published by the Society of Actuaries.	50% of the 1985 Pension Disability Table (DP-85 Table) Class 4.
School/Public Works/Town:	100% of the 1968-1972 Group LTD experience, excluding very large cases, published by the Society of Actuaries.	50% of the 1985 Pension Disability Table (DP-85 Table) Class 1.

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SECTION I

EXHIBIT A - CURRENT AND PROPOSED ACTUARIAL ASSUMPTIONS

	Current Assumption	Proposed Assumption
Percent Married	80% of active members are assumed to be married at retirement, with husbands 3 years older than their spouses.	85% of active members are assumed to be married at retirement, with husbands 3 years older than their spouses.
Asset Valuation Method (Actuarial Value)	The total value of the plan assets is adjusted by phasing in recognition of the difference between the expected return on market value and the actual return on market value over a five-year period at 20% per year.	No change.
Actuarial Cost Method	Entry Age Normal actuarial cost method. The Unfunded Accrued Liability is amortized as a level dollar amount over a decreasing number of years, starting with 30 years on July 1, 2009. The amortization period will decline by one each year until it reaches 10 years, after which time it will remain at 10 years.	Continued use of this funding method, but with a "level percent of payroll" amortization of any prior service costs.

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SECTION I

EXHIBIT B - ESTIMATED IMPACT OF PROPOSED ASSUMPTIONS
($ millions)

		Current Assumptions	After Proposed Assumption Changes	
		July 1, 2011 Valuation	Investment Return = 6.75% (per current asset allocation)	Investment Return = 7.25% (alternative asset allocation)
Funded Ratio*				
1.	Actuarial Value of Assets at July 1, 2011	$35.267	$35.267	$35.267
2.	Actuarial Liability as of July 1, 2011	57.377	68.181	63.768
3.	Unfunded Accrued Liability (UAL) as of July 1, 2011	22.110	32.914	28.501
4.	Funded Ratio at July 1, 2011: (1) / (2)	61.5%	51.7%	55.3%
Annual Town Cost for 2012-2013*				
1.	Normal Cost	$0.782	$1.388	$1.178
2.	Past Service Cost (28 year amortization of UAL)	2.001	1.847	1.694
3.	Total Town Contribution for 2012-2013: (1) + (2), not less than 0	2.783	3.235	2.872
4.	Total Compensation as of July 1, 2011	8.782	8.782	8.782
5.	Total Town Contribution for 2012-2013 as a Percentage of Compensation	31.7%	36.8%	32.7%
Annual Required Contribution for 2012-2013		2.783	3.235	2.872

* Note: The estimated impact on the July 1, 2011 funded ratio and Annual Required Contribution for 2012-2013 is for illustrative purposes only. We understand that any adopted changes in the actuarial assumptions would first be required to be included in the July 1, 2012 actuarial valuation (which develops the Annual Required Contribution for 2013-2014).

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SECTION II
ECONOMIC ASSUMPTIONS

A. OVERVIEW OF ECONOMIC ASSUMPTIONS

Actuarial Standard of Practice (ASOP) No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*, provides guidance to actuaries on selecting economic assumptions for measuring obligations under defined benefit plans. Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the Standard explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one "right answer", the Standard calls for the actuary to develop a best estimate range for each economic assumption, and then recommend a specific point within that range. Each economic assumption should individually satisfy the Standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

In our opinion, the economic assumptions set forth in this report have been developed in accordance with ASOP No. 27.

The remainder of this section contains the study results for the following economic assumptions:

- Consumer Price Inflation (CPI)
- Salary Scale and Payroll Growth Rate
- Cost of Living Increase
- Investment Return

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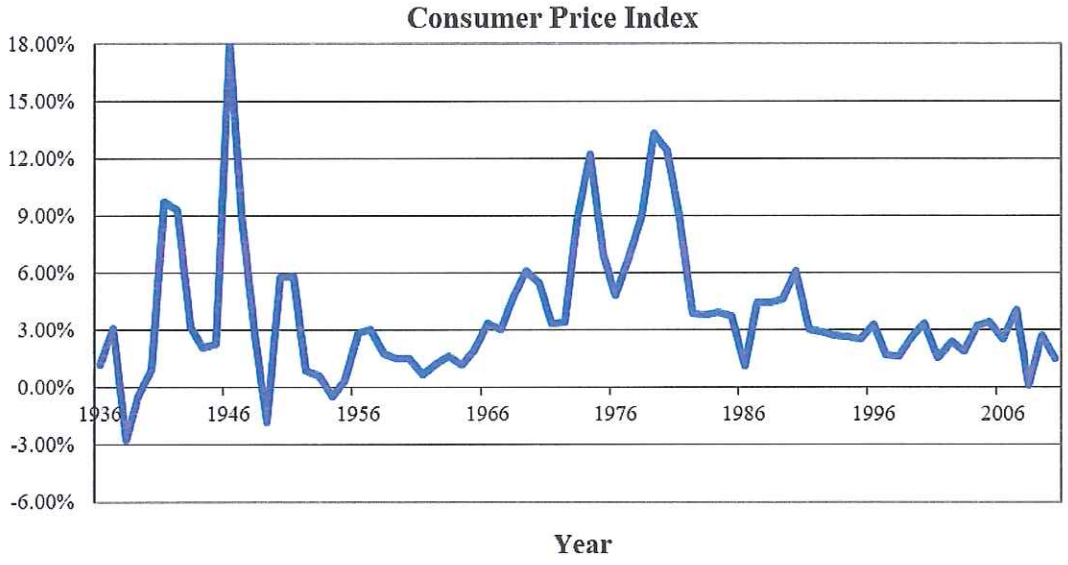
SECTION II
ECONOMIC ASSUMPTIONS

B. CONSUMER PRICE INFLATION (CPI)

Use in the Valuation: Future price inflation has an indirect impact on the results of the actuarial valuation through the development of the assumptions for investment return, cost of living adjustment, and salary scale.

The current assumption for price inflation is 3.00% per year.



Historical Perspective: We have used certain published economic statistics that have been accumulated on a monthly basis over the last 75 years. The data for price inflation is based on the Consumer Price Index, US City Average, All Urban Consumers (CPI). The data for periods ending in December of each year is shown graphically below.

There are numerous ways to review this data. The table below shows the compounded annual price inflation rate for various 10 year periods and for longer periods ended in December 2011. Standard Deviation is a measure of the extent to which inflation varied from the Mean, or average, for the period.

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SECTION II
ECONOMIC ASSUMPTIONS

B. CONSUMER PRICE INFLATION (CPI)

Period	Mean	Standard Deviation
2001-2011	2.48%	1.07%
1991-2001	2.51%	0.64%
1981-1991	3.91%	1.20%
1971-1981	8.62%	3.11%
1961-1971	3.19%	1.68%
2001-2011	2.48%	1.07%
1991-2011	2.49%	0.88%
1981-2011	2.96%	1.20%
1971-2011	4.35%	3.10%
1961-2011	4.12%	2.91%
75 years	3.78%	3.50%
25 years	2.90%	1.21%

Many economists forecast that future price inflation will be lower than the current assumption of 3.00%, but they may be looking at shorter periods than are appropriate for a pension valuation. To find an economic forecast with a long enough time frame to suit our purpose, we looked at the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the 2011 Trustees Report, the projected average annual increase in the CPI over the next 30 years under the intermediate cost assumptions was 2.8%. The reasonable range was stated as 1.8% to 3.8%.

Reasonable Range and Recommendation: Based on the history over the last 75 years, and future expectations, we recommend that the long-term assumed price inflation rate be lowered from 3.00% to 2.75%. This rate will be used to build the net investment return, pension escalation, and salary scale assumptions.

Consumer Price Inflation	
Current Assumption	3.00%
Reasonable Range	1.8% - 3.8%
Recommended Assumption	2.75%

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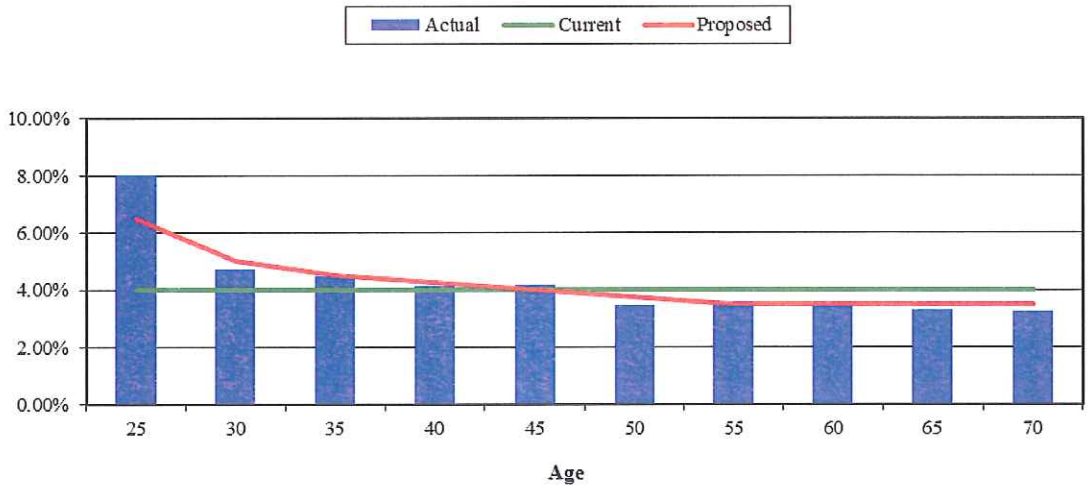
SECTION II
ECONOMIC ASSUMPTIONS

C. SALARY SCALE AND PAYROLL GROWTH RATE

Current Assumption: The current salary scale assumption is 4.00% per year. The payroll growth rate assumption is currently not applicable.

Study Design: We looked at the impact of age on annual salary increases for each individual in our study. We segregated the experience into 5-year age groups (i.e. ages 23-27, 28-32, etc.) and then smoothed the raw experience data to develop the proposed salary scale assumption.

Results: The graphs below correspond to different 5-year age groups. Actual experience is shown in blue; the results predicted by the current assumption are shown in green, and the proposed assumptions are shown in red.



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SECTION II
ECONOMIC ASSUMPTIONS

Salary Scale Recommendation: Move from a flat salary scale assumption to a graded salary scale assumption. Rates at younger ages are assumed to be greater than the current basis, while rates at older ages are assumed to be lower than the current basis.

Age	Rate
25	6.50%
30	5.00
35	4.50
40	4.25
45	4.00
50	3.75
55	3.50
60	3.50
65	3.50
70	3.50

Payroll Growth Rate Recommendation: Adopt a payroll growth rate assumption of 3.50% per year. The proposed assumption is consistent with the "ultimate" proposed rate of salary increase, shown above.

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SECTION II
ECONOMIC ASSUMPTIONS

D. COST OF LIVING ADJUSTMENT

Use in the Valuation: Public Works members and Fire members who retired before June 30, 2007 are entitled to post-retirement benefit adjustments equal to 50% of the percentage salary increase received by active bargaining unit members in the department from which the member retired. The current 2.0% assumption is 50% of the current 4.0% salary scale assumption. For other members, the current assumption matches the applicable fixed rate cost of living adjustment.

Fire, retired before 6/30/2007: 2.0% (based on 50% of the salary projection)

Fire, retired after 6/30/2007: 3.0%

Police: 3.0%

Public Works: 2.0% (based on 50% of the salary projection)

School Management and Non-Certified: 1.7%

Town Management, retired before 7/1/2004: 2.0%

Town Non Management: 2.0%

Town Management, retired after 7/1/2004: 3.0%

Recommendation: No change. For Public Works members and Fire members hired prior to June 30, 2007, the 2.0% COLA assumption is consistent with 50% of the average salary scale assumption of 4.0%. For the other group, the COLA is a fixed percentage increase and the current assumptions are equal to the fixed percentages.

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SECTION II
ECONOMIC ASSUMPTIONS

E. INVESTMENT RETURN

Current Assumption: 8.00% (net of investment-related administrative expenses).

Recommendation: Lower the assumption to 6.75% (net of investment-related administrative expenses). Under an alternative policy asset mix, lower the assumption to 7.25% (net of investment related administrative expenses).

Basis for Recommendation

Based on the following analysis, we have developed the best estimate range for the assumption regarding the long-term annualized rate of return on Plan assets, net of investment-related fees.

Investment Return	
Current Assumption	8.00%
Best-Estimate Range	5.25% to 8.19%
Best-Estimate	6.73%
Recommended Assumption	6.75% (current policy asset mix)
	7.25% (alternative policy asset mix)

The investment return assumption is one of the primary determinants in the allocation of the expected cost of the Fund's benefits, providing a discount of the estimated future benefit payments to reflect the time value of money. The valuation investment return assumption should represent the expected long-term rate of return on the actuarial value of assets, considering the Fund's asset allocation policy, expected long-term real rates of return on specific asset classes, the underlying inflation rate and investment-related expenses.

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SECTION II
ECONOMIC ASSUMPTIONS

ASOP No. 27 provides guidance to actuaries on selecting assumptions for measuring obligations under defined benefit pension plans. Because the future cannot be accurately predicted, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a combination of past experience, future expectations, and professional judgment. The actuary should consider a number of factors including the purpose and nature of the measurement and appropriate recent and long-term historical economic data. However, ASOP No. 27 explicitly advises the actuary not to give undue weight to recent experience.

Recognizing that there is not one "right answer", ASOP No. 27 calls for the actuary to develop a best estimate range for each economic assumption and then recommend a specific point within that range. Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

The Fund's Investment Policy

The Fund's long-term rate of return on its investments will be mostly determined by its allocation to various asset classes. According to the Fund's Investment Policy Statement, the target asset allocation is composed of 16.5% domestic large cap equity, 12.0% domestic mid cap equity, 10.5% domestic small cap equity, 13.0% international equity, 6.5% emerging markets equity, 6.5% real estate securities and 35.0% short term bonds.

For illustration purposes, we note that an alternative target asset allocation could be as follows: 16.5% domestic large cap equity, 12.0% domestic mid cap equity, 10.5% domestic small cap equity, 13.0% international equity, 6.5% emerging markets equity, 6.5% real estate securities, 25% investment grade fixed income and 10% high yield fixed income.

Domestic Large Cap Equity

We use the Dividend Discount Model to forecast the long-term return on large cap equity. According to this model, the expected annualized return on the equity market is the sum of long-term inflation, the current dividend yield (based on next year's expected dividend), and the expected long-term real growth rate in dividends.

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SECTION II
ECONOMIC ASSUMPTIONS

Our long-term assumption for the annualized rate of inflation is 2.75%. This is based on the difference between current yields on long maturity treasury bonds and inflation-indexed treasury bonds at the end of December 2011.

The trailing dividend yield on the S&P 500 Index was 2.19% at the end of December 2011. We expect the real growth rate in dividends to match the real growth in corporate earnings which, in turn, should closely track, but not exceed, the real growth rate in GDP. The December 2011 issue of Blue Chip Financial Forecasts reports a consensus forecast for average U.S. real GDP growth of about 2.70% over the next 10 years. We use 2.40% as our forecast for the growth in real earnings and dividends. Therefore, the current dividend yield based on next year's expected dividend is 2.24% (2.19% x 1.024 = 2.24%). Adding the dividend growth rate to the yield gives us an expected real return of 4.64% (2.24% + 2.40% = 4.64%). Finally, we add (using geometric addition) expected inflation of 2.75% per year to adjust the real return to a nominal return. This leads to the expected annualized return for large cap equity of 7.52%.

$$(1 + 4.64\%) \times (1 + 2.75\%) - 1 = 7.52\%$$

We round this result to 7.50%.

Core Fixed Income

We assume that the yield to maturity of the Barclays Capital Aggregate Bond Index will move over the next five years from its current level to an expected level. The expected level is equal to the forecasted yield of long Treasury bonds in five years based on consensus forecasts (5.60%) plus the Aggregate's average historical yield spread to long Treasury bonds. Expected 30-year returns reflect the impact of this yield movement. The yield to maturity of the Barclays Capital Aggregate Bond Index was 2.24% at the end of December 2011. Its yield spread over long Treasury bonds has averaged -0.08% since 1990. Applying this process leads to an expected annualized yield of 5.52% in 5 years and an annualized return of 4.65% over the 30-year period.

Other Asset Classes

We use capital asset pricing theory to develop expected returns for other asset classes. The theory holds that the expected return for an asset class is based on its contribution to the risk of the total market portfolio containing all assets. Assets that bring high risk to the market portfolio have higher expected returns than assets that bring low risk. Risk is measured by covariance. The level of expected return associated with the amount of risk

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SECTION II
ECONOMIC ASSUMPTIONS

is calibrated by the expected returns developed above for large cap equity and core fixed income.

The expected returns for the portfolio's asset classes are shown in the tables below for both the current policy asset mix and an alternative policy asset allocation. We show both the expected annualized rate of return and the expected arithmetic average return for each asset class and the total portfolio. The expected arithmetic average return for each asset class is a necessary input to determine the expected annualized return on the total portfolio. The expected arithmetic average return is the best estimate of the return in any single year, and is always higher than the expected annualized return. The annualized return over a multiple-year period is less than the arithmetic average return due to volatility and the process of compounding. The expected annualized rate of return is based on a 30-year horizon. We also show the expected standard deviation of annual returns for each asset class. The standard deviations and the correlations between each pair of assets (not shown) are estimated based on actual returns over the last 42 years (or longest time period available).

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SECTION II
ECONOMIC ASSUMPTIONS

Current Policy Asset Mix

Asset Class	Policy Target Weight	Expected 30-Year Annualized Return	Expected Arithmetic Average Annual Return	Expected Annual Standard Deviation
Domestic Large Cap Equity	16.5%	7.50%	8.90%	17.92%
Domestic Small Cap Equity	12.0	7.50	9.59	26.49
Domestic Mid Cap Equity	10.5	7.50	10.45	22.05
International Equity	13.0	7.50	9.34	20.65
Emerging Markets Equity	6.5	7.50	11.70	32.09
Real Estate	6.5	6.50	7.26	13.00
Short Term Bonds	35.0	3.70	3.76	3.45
Total Portfolio	100.0%	6.83%*	7.48%*	12.04%*

Alternative Policy Asset Mix

Asset Class	Policy Target Weight	Expected 30-Year Annualized Return	Expected Arithmetic Average Annual Return	Expected Annual Standard Deviation
Domestic Large Cap Equity	16.5%	7.50%	8.90%	17.92%
Domestic Small Cap Equity	12.0	7.50	9.59	26.49
Domestic Mid Cap Equity	10.5	7.50	10.45	22.05
International Equity	13.0	7.50	9.34	20.65
Emerging Markets Equity	6.5	7.50	11.70	32.09
Real Estate	6.5	6.50	7.26	13.00
Investment Grade Fixed Income	25.0	4.65	4.85	6.57
High Yield Fixed Income	10.0	6.75	7.31	11.15
Total Portfolio	100.0%	7.35%*	8.11%*	13.04%*

* The derivation of the portfolio's annualized rate of return and standard deviation are complicated and cannot be calculated by what is provided in the above table.

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SECTION II
ECONOMIC ASSUMPTIONS

Under the current policy asset mix, our best estimate assumption for the long-term annualized rate of return on the Fund's policy portfolio is 6.83% before investment management fees. Our best estimate for the long-term arithmetic average return is 7.48% before investment management fees.

Under the alternative policy asset mix, our best estimate assumption for the long-term annualized rate of return on the Fund's policy portfolio is 7.35% before investment management fees. Our best estimate for the long-term arithmetic average return is 8.11% before investment management fees.

Since the Fund's assets accumulate at the long-term annualized rate of return, this is the expected rate of return that should be used as the basis for selecting the investment return assumption.

Investment Management Fees

Most funds pay considerable fees to active investment managers. If active management fails to outperform an index fund by at least the amount of the difference between active management fees and index fund fees, the Fund always has the option to use index funds. So, over the long run, we would expect the Fund's long-term rate of return, net of fees, to be the same or higher than that which could be earned using index funds. For a Fund this size, index fees are estimated to be about 10 basis points, or 0.10%.

Under the current policy asset mix, our best estimate assumption for the long-term annualized rate of return on the Fund's policy portfolio is 6.73% after reflecting investment management fees. Our best estimate assumption for the long-term arithmetic average return on the Fund's policy portfolio is 7.38% after reflecting investment management fees.

Under the alternative policy asset mix, our best estimate assumption for the long-term annualized rate of return on the Fund's policy portfolio is 7.25% after reflecting investment management fees. Our best estimate assumption for the long-term arithmetic average return on the Fund's policy portfolio is 8.01% after reflecting investment management fees.

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SECTION II
ECONOMIC ASSUMPTIONS

Reasonable Range and Recommendation: Based on the ASOP No. 27 guidelines, we conclude that the reasonable range should be based on the expected nominal rates of return between the 25th and the 75th percentile projected out 75 years, less investment-related administrative expenses.

	Investment Return	
Current Assumption	8.00%	
Reasonable Range	5.25% - 8.19%	(current policy asset mix)
	5.65% - 8.83%	(alternative policy asset mix)
Recommended Assumption	6.75%	(current policy asset mix)
	7.25%	(alternative policy asset mix)

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SECTION III
DEMOGRAPHIC ASSUMPTIONS

A. TURNOVER

Current Assumption: Age-graded rates per the following tables;

Fire and Police

Age	Male	Female
25	6.87%	9.87%
30	4.87%	6.87%
35	3.87%	4.87%
40	2.65%	3.65%
45	1.50%	2.50%
50	0.16%	1.16%
55	0.00%	0.00%
60 and over	0.00%	0.00%

School, Public Works and Town

Age	Male	Female
25	6.92%	9.92%
30	4.92%	6.92%
35	3.92%	4.92%
40	2.78%	3.78%
45	1.69%	2.69%
50	0.47%	1.47%
55	0.08%	0.08%
60 and over	0.00%	0.00%

Results: We analyzed the data for 2006 through 2011 by age for each individual in our study. We combined the experience into 5-year age groups (i.e. ages 23-27, 28-32, etc.) and then smoothed the raw experience data to develop the proposed turnover assumption. Any turnover experience occurring at central ages of 55 and above was considered to be an "outlier" and was not used for purposes of developing the proposed turnover assumption. Each graph below shows the results by age group. Actual experience is shown in blue (males) and orange (females) while the results predicted by the current assumptions are shown in red (males) and green (females).

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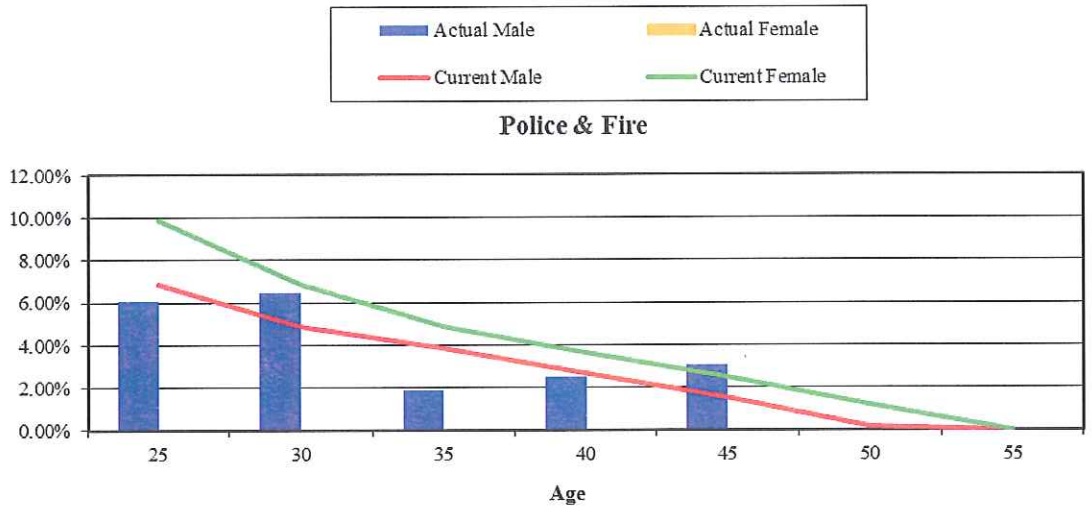
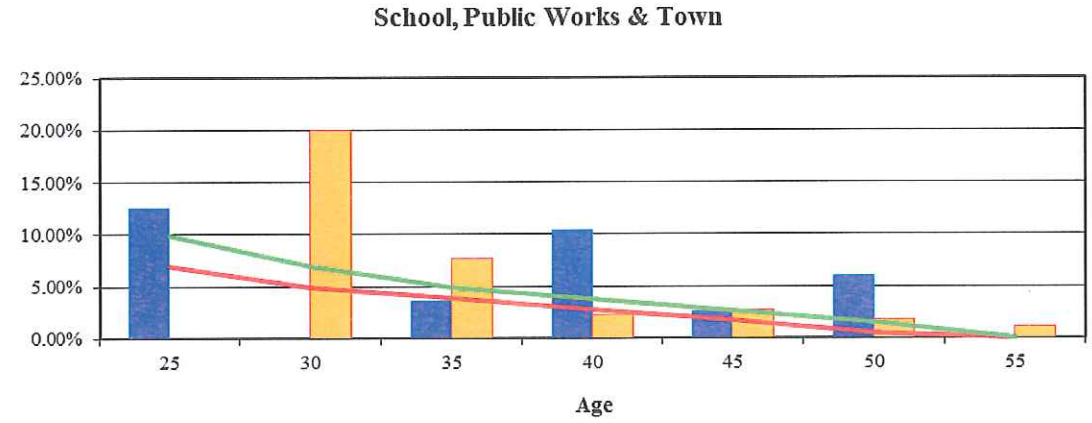
SECTION III
DEMOGRAPHIC ASSUMPTIONS





Recommended Assumption: Based on our judgment, the current age-graded rates are reasonable. During economic downturns, turnover experience tends to be lighter than expected. We recommend the continued use of the current assumptions for all groups.

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SECTION III
DEMOGRAPHIC ASSUMPTIONS

B. RETIREMENT

Current Assumption:

Employees are assumed to retire as follows:

Fire: 100% at 27 years of service.

Police: 50% at 25 years of service and the remainder at 27 years of service.

Town and Public Works: 100% at the later of age 60 or 10 years of service.

School (Council #94): 50% on completion of age 55 and 20 years of service, 100% at age 60 with 10 years and 5% between age 56-59.

School (Non-Council #94): 100% on completion of age 60 with 10 years of service.

Any employee who has already passed the Assumed Retirement Age is assumed to retire immediately.

Study Design: We analyzed the data for 2006 through 2011 by age for each individual in our study. We smoothed the raw experience data to develop the proposed retirement assumption for each group. Each graph below shows the results by age group. Actual experience is shown in blue. The results predicted by the current assumptions are shown in green, and the results predicted by the proposed assumptions are shown in red.

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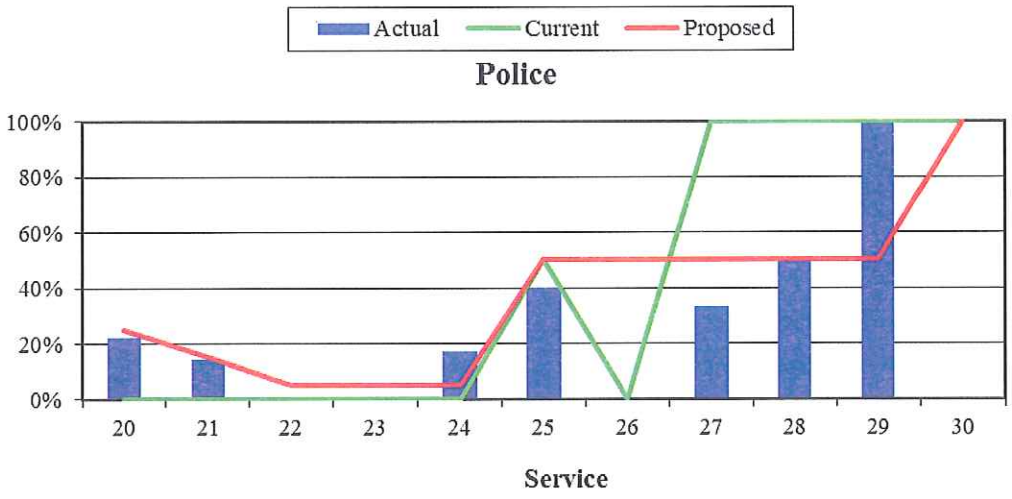
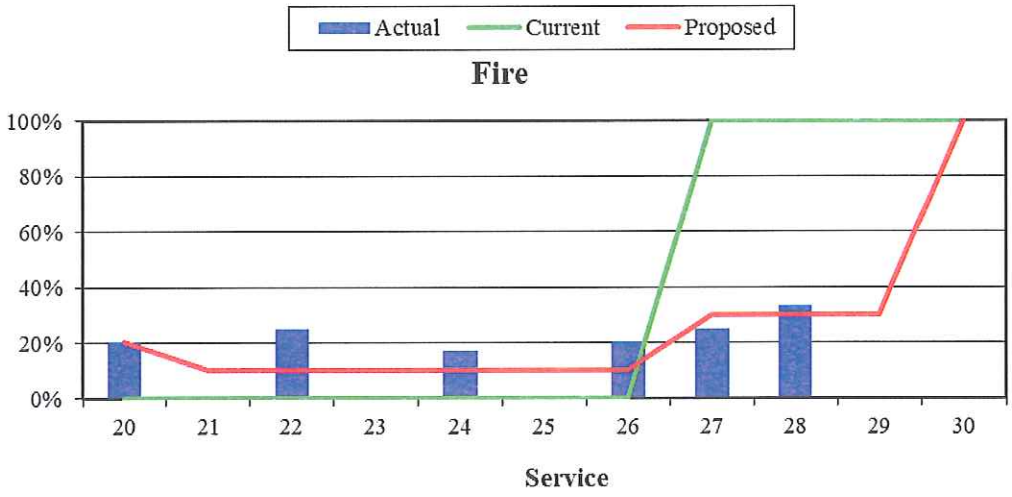
DEMOGRAPHIC ASSUMPTIONS





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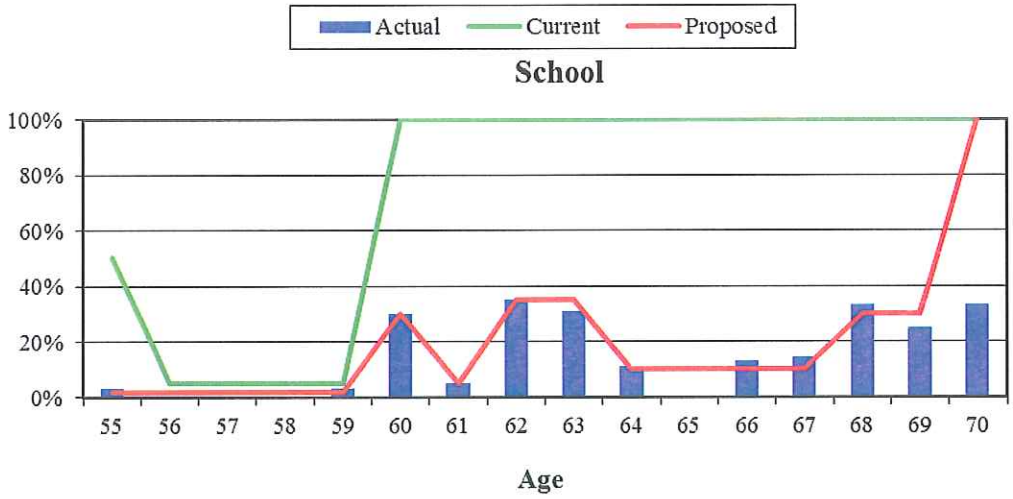
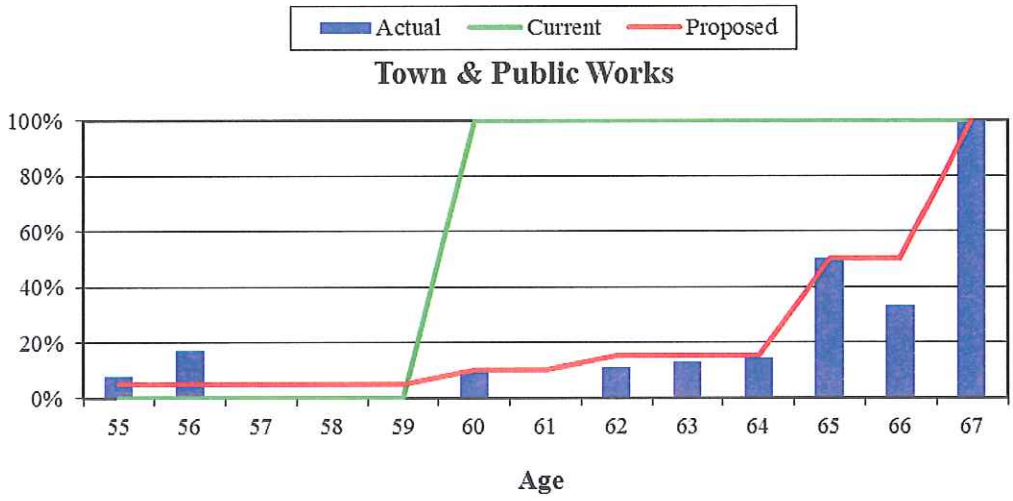
DEMOGRAPHIC ASSUMPTIONS





* For Town (Non-Management), proposed rates start at age 60.

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SECTION III
DEMOGRAPHIC ASSUMPTIONS

Results and Recommended Assumption:

We recommend modifying the current assumptions to better reflect actual experience. The recommended rates are shown below:

Service	Police	Fire
20	25%	20%
21	15	10
22	5	10
23	5	10
24	5	10
25	50	10
26	50	10
27	50	30
28	50	30
29	50	30
30	100	100

Age	School	Town Mgmt / Public Works	Town Non-Mgmt
55	2%	5%	
56	2	5	
57	2	5	
58	2	5	
59	2	5	
60	30	10	10%
61	5	10	10
62	35	15	15
63	35	15	15
64	10	15	15
65	10	50	50
66	10	50	50
67	10	100	100
68	30		
69	30		
70	100		

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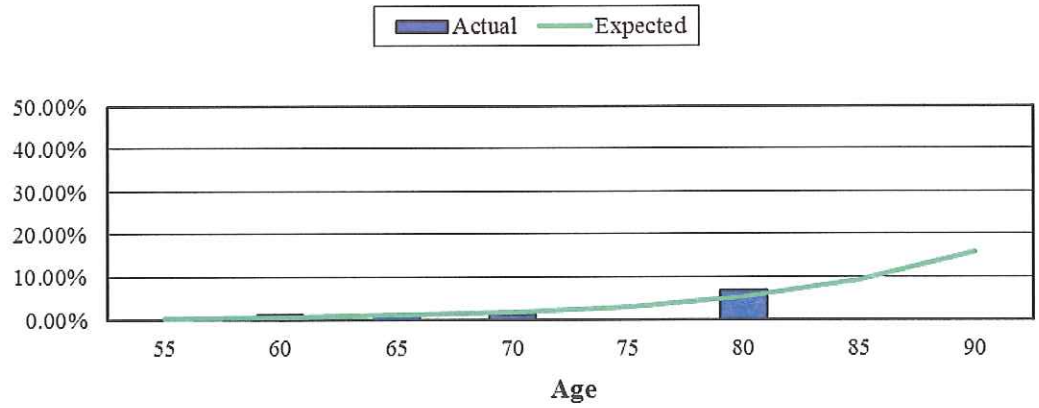
SECTION III
DEMOGRAPHIC ASSUMPTIONS

C. HEALTHY MORTALITY

Current Assumption: The RP-2000 Combined Healthy Mortality Table with mortality projection to 2010 per Scale AA, with separate male and female tables. Pre-retirement mortality rates for Fire and Police employees are assumed to be 110% of these rates.

Study Design: We looked at the rates of mortality among retirees and beneficiaries, weighted by the number of males and females in each plan.

Results: The graph below shows the actual rate of deaths during the study period along with the rate of deaths predicted by the current mortality table. Please note that the graph shows the rates of actual and expected deaths, not the number of deaths. Actual experience is shown in blue; the results predicted by the current assumptions are shown in green. The current assumptions are generally reasonable.



Recommended Assumption: The mortality table should be updated and should provide a margin for future mortality improvement. The plan's population is not large enough to generate full credible mortality experience. Therefore, the mortality assumption should reflect a standard published table. We recommend that the mortality assumption be updated to the RP-2000 Combined Healthy Mortality Table with generational projection per Scale AA. The RP-2000 mortality table is the table recommended by the Society of Actuaries Retirement Plan Experience Committee (RPEC), and generational projection is consistent with the RPEC's recommendation that "pension valuations should take trends in long-term mortality improvement into account." We recommend continuing to use separate male and female tables.

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SECTION III
DEMOGRAPHIC ASSUMPTIONS

D. DISABLED MORTALITY

Current Assumption: The unpublished OASDI table of 1957-1966 experience, adjusted for actual experience through 1973, for ages 65 and under; graded into the 1951 Group Annuity projected to 1975 non-disabled life mortality, for ages 85 and over.

Study Design: We looked at the rates of mortality among disabled participants, for which there were none during the period.

Results: We recommend moving to a more recent table as the plan's population is not large enough to generate fully credible disability experience. Therefore, the disability assumption should reflect a standard published table. We recommend that the disability mortality table be updated to the RP-2000 Disabled Mortality Table.

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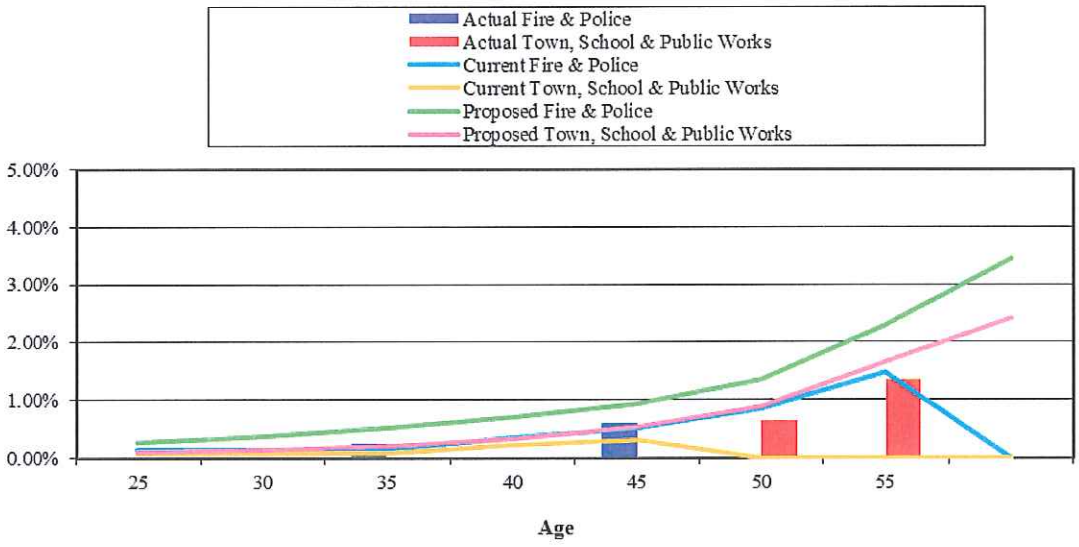
SECTION III
DEMOGRAPHIC ASSUMPTIONS

E. DISABILITY

Current Assumption: 160% of the 1968-1972 Group LTD experience, excluding very large cases, published by the Society of Actuaries for Police and Firefighters. 100% of the 1968-1972 Group LTD experience, excluding very large cases, published by the Society of Actuaries for School, Public Works and Town employees.

Recommendation: We recommend moving to a more recent table as the plan's population is not large enough to generate fully credible disability experience. Therefore, the disability assumption should reflect a standard published table. For the Police and Fire groups, we recommend that the disability assumption be updated to 50% of the 1985 Pension Disability Table (DP-85 Table) Class 4 rates. For the Town, Public Works and School groups, we recommend that the disability assumption be updated to 50% of the 1985 Pension Disability Table (DP-85 Table) Class 1 rates.



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SECTION III
DEMOGRAPHIC ASSUMPTIONS

F. PERCENT MARRIED

Current Assumption: 80% of participants are assumed to have an eligible spouse at retirement. Female spouses are assumed to be three years younger than male spouses.

Recommendation: Experience indicates that a slightly higher percentage of retirees are married than under the current basis. We recommend changing this assumption to 85%, with female spouses assumed to be three years younger than male spouses.

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SECTION IV
ACTUARIAL COST METHODS

A. ASSET VALUATION METHOD (ACTUARIAL VALUE)

Current Method: You are using a smoothing method which phases in recognition of the difference between the actual return on market value and the expected return on market value over a five-year period at 20% per year.

Recommendation: We recommend the continued use of this asset valuation method. It is a widely-used method for public sector pension plans and provides an excellent degree of smoothing of investment gains and losses.

B. ACTUARIAL COST METHOD

Current Method: The current method is the Entry Age Normal Cost Method. It is used in determining the contributions required for funding future benefits by determining two pieces: the Normal Cost of each individual's benefit accrued during the year and any prior service costs amortized over a 30 year period (starting July 1, 2009). The amortization period will decline by one each year until it reaches 10 years, after which time it will remain at 10 years.

Recommendation: We recommend the continued use of this actuarial cost method. It is commonly used for public sector pension plans and is one of the acceptable methods under GASB 25/27. However, we recommend a change from a "level dollar" to a "level percent of payroll" amortization methodology of any prior service costs.

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APPENDIX

SELECTED ECONOMIC ASSUMPTIONS FROM THE 2011 OASDI TRUST FUNDS ANNUAL REPORT

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112th Congress, 1st Session ---------- House Document 112-23

THE 2011 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS

COMMUNICATION

FROM

THE BOARD OF TRUSTEES, FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS

TRANSMITTING

THE 2011 ANNUAL REPORT OF THE BOARD OF TRUSTEES OF THE FEDERAL OLD-AGE AND SURVIVORS INSURANCE AND FEDERAL DISABILITY INSURANCE TRUST FUNDS

May 13, 2011.---Referred to the Committee on Ways and Means and ordered to be printed

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1.1 percentage points for 2020 and to average 1.2 percentage points for 2021 through 2085. For the low-cost assumptions, the real-wage differential is projected to average 3.3 percentage points for 2011 through 2013, 2.2 percentage points for 2014 through 2020, and 1.8 percentage points for 2021 through 2085. For the high-cost assumptions, the real-wage differential is projected to average 2.3 percentage points for 2011 through 2013, and then mostly decline to 0.6 percentage point by 2020, and to average 0.6 percentage point for 2021 through 2085.

Table V.B1.—Principal Economic Assumptions

Calendar year	Annual percentage change[a] in—						
	Productivity (Total U.S. economy)	Earnings as a percent of compensation	Average hours worked	GDP price index	Average annual wage in covered employment	Consumer Price Index	Real-wage differential[b]
Historical data:							
1960 to 1965....	3.2	-0.2	0.2	1.4	3.2	1.2	2.0
1965 to 1970....	2.0	-.4	-.7	4.1	5.8	4.2	1.6
1970 to 1975....	2.1	-.7	-.9	6.7	6.6	6.8	-.2
1975 to 1980....	.9	-.6	-.2	7.3	8.9	8.9	-.1
1980 to 1985....	1.7	-.3	.0	5.2	6.5	5.2	1.3
1985 to 1990....	1.3	.1	-.1	3.2	4.7	3.8	.9
1990 to 1995....	1.2	-.2	.4	2.5	3.6	3.0	.6
1995 to 2000....	2.3	.5	.1	1.7	5.3	2.4	2.9
2000 to 2005....	2.5	-.5	-.8	2.4	2.7	2.5	.2
2005 to 2010....	1.8	-.2	-.4	2.1	2.5	2.3	.2
2000.....	2.7	.1	-1.1	2.2	6.1	3.5	2.6
2001.....	2.4	-.5	-1.3	2.3	2.0	2.7	-.7
2002.....	3.2	-1.1	-1.0	1.6	.7	1.4	-.7
2003.....	3.0	-1.3	-1.5	2.2	2.6	2.2	.3
2004.....	2.4	.7	.0	2.8	4.7	2.6	2.1
2005.....	1.5	-.4	-.2	3.3	3.7	3.5	.2
2006.....	.8	.5	.0	3.3	4.6	3.2	1.4
2007.....	1.2	.4	-.4	2.9	4.7	2.9	1.8
2008.....	1.1	-.4	-.7	2.2	2.3	4.1	-1.8
2009.....	2.9	-1.2	-1.8	.9	-1.8	-.7	-1.2
2010[c].....	2.7	-.1	.7	1.0	2.9	2.1	.8
Intermediate:							
2011.....	1.7	.2	.2	1.2	4.1	1.2	2.9
2012.....	2.0	.2	.0	1.3	4.5	1.7	2.9
2013.....	2.0	.0	.0	1.5	4.6	1.9	2.7
2014.....	1.9	-.3	.0	1.6	4.2	2.0	2.2
2015.....	1.7	-.3	.0	1.6	3.9	2.0	1.9
2016.....	1.5	.0	.0	1.6	4.0	2.0	2.0
2017.....	1.5	.0	.0	1.8	4.0	2.2	1.8
2018.....	1.6	.2	.0	2.2	4.4	2.6	1.8
2019.....	1.6	.0	.0	2.4	4.2	2.8	1.4
2020.....	1.6	-.1	.0	2.4	3.9	2.8	1.1
2020 to 2025....	1.7	-.1	.0	2.4	3.9	2.8	1.1
2025 to 2085....	1.7	-.1	.0	2.4	4.0	2.8	1.2

Table V.B1.—Principal Economic Assumptions (Cont.)

Calendar year	Annual percentage change[a] in— Productivity (Total U.S. economy)	Earnings as a percent of compensation	Average hours worked	GDP price index	Average annual wage in covered employment	Consumer Price Index	Real-wage differential[b]
Low-cost:							
2011	1.8	0.2	0.3	1.2	4.4	1.1	3.2
2012	2.2	.2	.1	.9	4.5	1.1	3.4
2013	2.2	.0	.1	1.0	4.5	1.3	3.3
2014	1.8	-.2	.1	1.1	3.9	1.4	2.5
2015	1.6	-.3	.1	1.2	3.6	1.5	2.2
2016	1.6	.0	.1	1.3	3.8	1.6	2.2
2017	1.8	.1	.1	1.4	3.9	1.7	2.2
2018	1.9	.2	.1	1.5	4.0	1.8	2.3
2019	1.9	.0	.1	1.5	3.8	1.8	2.0
2020	1.9	.0	.1	1.5	3.5	1.8	1.7
2020 to 2025	2.0	.0	.1	1.5	3.5	1.8	1.7
2025 to 2085	2.0	.0	.1	1.5	3.6	1.8	1.8
High-cost:							
2011	1.3	.2	.1	1.5	3.8	1.6	2.2
2012	1.9	.2	-.1	1.9	4.8	2.4	2.5
2013	1.9	.0	-.1	2.3	5.1	2.8	2.3
2014	1.7	-.3	-.1	2.5	4.8	3.0	1.8
2015	1.7	-.4	-.1	2.7	4.9	3.2	1.7
2016	1.6	-.1	-.1	2.7	5.1	3.2	1.9
2017	1.4	-.1	-.1	2.9	4.9	3.4	1.5
2018	1.3	.1	-.1	3.1	4.8	3.6	1.2
2019	1.3	-.1	-.1	3.3	4.7	3.8	.9
2020	1.4	-.2	-.1	3.3	4.4	3.8	.6
2020 to 2025	1.4	-.2	-.1	3.3	4.3	3.8	.5
2025 to 2085	1.4	-.2	-.1	3.3	4.4	3.8	.6

[a] For rows with a single year listed, the value is the annual percentage change from the prior year. For rows with a range of years listed, the value is the compound average annual percentage change.

[b] For rows with a single year listed, the value is the annual percentage change in the average annual wage in covered employment less the annual percentage change in the Consumer Price Index. For rows with a range of years listed, the value is the average of annual values of the differential. Values are rounded after all computations.

[c] Historical data are not available for the full year. Estimated values vary slightly by alternative and are shown for the intermediate assumptions.

5. Labor Force and Unemployment Projections

The civilian labor force is projected by age, sex, marital status, and presence of children. Projections of the labor force participation rates for each group take into account disability prevalence, educational attainment, the average level of Social Security retirement benefits, the state of the economy, and the change in life expectancy. The projections also include a "cohort effect" that applies differences in participation rates for a cohort at a specific age, relative to earlier cohorts at the same age, to participation rates for that cohort at older ages.

The annual rate of growth in the labor force decreased from an average of about 2.1 percent during the 1970s and 1980s to about 1.1 percent from 1990