

**THE POLICE AND FIRE RETIREMENT SYSTEM OF
THE CITY OF DETROIT**

5-YEAR EXPERIENCE STUDY

JULY 1, 2002 THROUGH JUNE 30, 2007

**ACTUARIAL INVESTIGATION REPORT
2002-2007**

TABLE OF CONTENTS

Item	Section
Overview and Economic Assumptions	A
Summary of the Valuation Results	B
Salary Increases	C
Retirement Experience	D
Withdrawal Experience	E
Disability Experience	F
Mortality Experience	G
Miscellaneous and Technical Assumptions	H
New Assumption Listing	I
Glossary	J

January 29, 2009

The Board of Trustees
The Police and Fire Retirement System of the City of Detroit
Dear Board Members:

The results of the 5-year *actuarial experience study* of the Police and Fire Retirement System of the City of Detroit are presented in this report. The investigation was conducted for the purpose of updating the actuarial assumptions used in valuing the actuarial liabilities of the Police and Fire Retirement System of the City of Detroit.

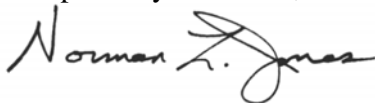
The investigation was based upon the statistical data furnished for annual active member and retired life actuarial valuations concerning members who died, withdrew, became disabled or retired during the last 5 years.

The investigation covered the 5-year period from *July 1, 2002 to June 30, 2007*, and was carried out using generally accepted actuarial principles and techniques.

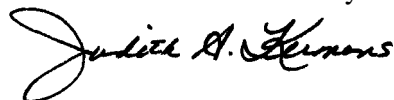
We believe that the actuarial assumptions recommended in this experience study report represent individually and in the aggregate reasonable estimates of future experience of the Police and Fire Retirement System of the City of Detroit.

The actuaries submitting this statement are Members of the American Academy of Actuaries (M.A.A.A.) as indicated, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



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SECTION A

OVERVIEW AND ECONOMIC ASSUMPTIONS

SUMMARY OF FINDINGS

The five year period (July 1, 2002 to June 30, 2007) covered by this experience study provided sufficient data to form a basis for recommending changes in many of the assumptions used in the actuarial valuations of the Police and Fire Retirement System of the City of Detroit. The recommended actuarial assumptions resulting from this experience study are summarized below:

- A spread for funding purposes between 3.0% and 4.0% with the wage inflation assumption between 4.8% and 3.5%, resulting in an overall investment return assumption of between 7.5% and 7.8%.

- Police
 - no change in the rates of ultimate withdrawal.
 - increase in the rates of select withdrawal.
 - decrease the rates of disability.
 - increase the rates of age based retirement.
 - no change in the rates of service based retirement.

- Fire
 - decrease in the rates of ultimate withdrawal.
 - no change in the rates of select withdrawal.
 - increase in the rates of duty disability.
 - decrease in the rates of non-duty disability.
 - increase the rates of age based retirement.
 - decrease the rates of service based retirement.

- Police and Fire
 - decrease the male rates of post-retirement mortality.
 - increase the female rates of post-retirement mortality.
 - increase the rates of pre-retirement mortality.

Results based upon the recommended demographic assumptions and the range of economic assumptions we are recommending for consideration are shown in Section B.

INTRODUCTION

Each year as of June 30, the actuarial liabilities of the System are valued. In order to perform the valuation, assumptions must be made regarding the future experience of the system with regard to the following risk areas:

- Rates of **withdrawal** of active members.
- Rates of **disability** among active members.
- Patterns of **salary increases** among active members.
- Rates of **retirement** among active members.
- Rates of **mortality** among active members, retirants, and beneficiaries.
- Long-term rates of **investment return** to be generated by the assets of the System.

Assumptions should be carefully chosen and continually monitored. An unrealistic set of assumptions can lead to:

- Understated costs resulting in either an inability to pay benefits when due, or gradual increases in required contributions as time progresses;
- Overstated costs resulting in an unnecessarily large burden on the current generation of employers and taxpayers.

A single set of assumptions will not be suitable indefinitely. Things change, and our understanding of things (whether or not they are changing) also changes. The package of assumptions is then adjusted to reflect basic experience trends -- but not random year to year fluctuations. Actuarial assumptions were last revised following the June 30, 2002 and June 30, 2003 regular actuarial valuations.

No single 5-year experience period should be given full credibility in the setting of actuarial valuation assumptions. When we see significant differences between what is expected from our assumptions and actual experience, our strategy in recommending a change in assumptions is usually to select rates that would produce results somewhere between the actual and expected experience. In this way, with each experience study the actuarial assumptions become better and better representations of actual experience. Consequently, temporary conditions that might influence a particular experience study period will not unduly influence the choice of long-term assumptions.

We are recommending certain changes in assumptions. The various assumption changes and their impact on the required contribution are described on the following pages.

Each of the demographic assumptions (withdrawal, disability, mortality and retirement) and rates of salary increases were analyzed both on a sex-distinct and combined-sex basis. Other than mortality, results on both bases were similar (this being consistent with the way current assumptions are structured) and hence combined results are shown in this report.

A brief summary of the analysis of decrement assumptions is presented on the following pages.

SUMMARY OF FINDINGS

Decrement Assumptions

Pay Increase Rates. The merit and longevity portion of pay increases were higher than assumed at many ages. Rates were adjusted slightly to bring them closer to actual experience. This change acts to increase the computed employer contribution rate. Details are reported in Section C.

Normal (Age Based) Retirement Experience. Overall, there were slightly more retirements than expected. Rates were adjusted to bring them closer to actual experience. This change acts to increase the computed employer contribution rate. Details are reported in Section D.

Normal (Service Based) Retirement Experience. There were fewer retirements than expected. For Fire members, rates were adjusted to bring them closer to actual experience. This change acts to decrease the computed employer contribution rate. Details are reported in Section D.

Rates of Withdrawal.

Police. Ultimate turnover rates (those with 5 or more years of service) were close to assumed rates. No change is recommended for ultimate withdrawal. Withdrawal rates for individuals with less than 5 years of service (select withdrawal) were greater than assumed. The observed rates were adjusted to bring them closer to actual experience. This change acts to decrease the computed employer contribution rate. Details are reported in Section E.

Fire. Ultimate turnover rates (those with 5 or more years of service) were less than assumed rates. Rates were adjusted to bring them closer to actual experience. This change acts to increase the computed employer contribution rate. Withdrawal rates for individuals with less than 5 years of service (select withdrawal) were close to assumed. No change is recommended for select withdrawal. Details are reported in Section E.

SUMMARY OF FINDINGS

Disability Rates.

Police. Crude disability rates (duty and non-duty) were less than previously assumed rates. The observed rates were adjusted to bring them closer to actual experience. This change acts to decrease the computed employer contribution rate. Details are reported in Section F.

Fire. Non-duty disability rates were less than previously assumed rates. Non-duty disability rates were adjusted to bring them closer to actual experience. This change acts to decrease the computed employer contribution rate. Duty disability rates were greater than previously assumed rates. Duty disability rates were adjusted to bring them closer to actual experience. This change acts to increase the computed employer contribution rate. Details are reported in Section F.

Death-in-Service Rates. Pre-Retirement mortality was greater than assumed. Proposed pre-mortality rates are a multiple (75%) of the proposed post-retirement mortality rates. These changes act to decrease the employer contribution rate.

Retired Life Mortality. Retired life mortality was higher than assumed for males and females. Proposed assumptions include less mortality than occurred so as to provide a margin for future increases in life expectancy. Proposed assumptions for all males and females at younger ages result in a slight decrease in life expectancy. A slight increase in life expectancy is proposed for females at older ages. These changes, in aggregate, act to increase the employer contribution rate. Details are reported in Section G.

Post-retirement disabled mortality was changed to be the same table as healthy mortality set-forward ten years.

SUMMARY OF DECREMENT EXPERIENCE
2002 - 2007

Police and Fire				
Decrement Risk Area	Actual	Expected		
		Old	New	Change
<i>Mortality - Active Lives</i>	45	20	24	4
<i>Mortality - Retired Lives</i>				
Male	857	820	785	(35)
Female	57	17	20	3

Police				
Decrement Risk Area	Actual	Expected		
		Old	New	Change
<i>Withdrawal - Select</i>	235	143	190	47
<i>Withdrawal - More Than 5 Years of Service (Ultimate)</i>	251	264	264	0
<i>Ordinary Disability</i>	15	30	23	(7)
<i>Duty Disability</i>	72	91	83	(8)
<i>Normal Retirement (Age Based)</i>	20	19	19	0
<i>Normal Retirement (Service Based)</i>	538	564	564	0

Fire				
Decrement Risk Area	Actual	Expected		
		Old	New	Change
<i>Withdrawal - Select</i>	16	27	27	0
<i>Withdrawal - More Than 5 Years of Service (Ultimate)</i>	27	39	33	(6)
<i>Ordinary Disability</i>	3	8	6	(2)
<i>Duty Disability</i>	68	56	61	5
<i>Normal Retirement (Age Based)</i>	2	1	3	2
<i>Normal Retirement (Service Based)</i>	194	278	238	(40)

ECONOMIC ASSUMPTIONS

Economic assumptions include long-term rates of investment return, wage inflation (the across-the-board portion of salary increases) and price inflation. Unlike demographic activities, economic activities do not lend themselves to analysis solely on the basis of internal historical patterns because both salary increases and investment return are more affected by external forces; namely inflation, general productivity changes and changes in financial markets. Estimates of economic activities are generally selected on the basis of the expectations in an inflation-free environment and then both are increased by some provision for long-term inflation.

If inflation and/or productivity increases are higher than expected, actual rates of salary increase and investment return are likely to exceed the assumed rates. Salaries increasing faster than expected produce unexpected liabilities. Investment return exceeding the assumed rates (whether due to manager performance, change in the mix of assets, or general inflation) results in unanticipated assets. To the extent that inflation, productivity, and other factors have about the same effect on both sides of the balance sheet, these additional assets and liabilities can offset one another over the long-term.

Current economic assumptions for the System are as follows:

Investment Return	7.80%
Wage Inflation	4.80
Spread	3.00

Investment Return Results

The investment return on the assets of the System over the July 1, 2002 – June 30, 2007 period was as follows:

<u>Year Ending 6/30</u>	<u>Rate of Return</u>		<u>Rate of Price Inflation</u>	<u>Increases in Average Salary</u>
	<u>Actuarial Value</u>	<u>Market Value</u>		
2003	(6.9) %	2.6 %	2.1 %	2.4 %
2004	1.2	14.7	3.3	8.1
2005	7.1	7.7	2.5	2.1
2006	10.7	10.1	4.3	1.4
2007	13.4	16.3	2.7	3.3
Arithmetic Average	5.1	10.3	3.0	3.5

The assets of the System are valued using a market-related method for actuarial valuation purposes. The 5.1% average return (based on actuarial value) is below the 7.8% assumed return. However, as of June 30, 2007, there were remaining unrecognized market gains. **Those unrecognized gains have been more than offset by market losses since that date.**

ECONOMIC ASSUMPTIONS – INFLATION

Wage Inflation. The long-term rate of increase in National Average Earnings over the last 58 years has been 4.9% which is slightly higher than the current System assumption. It is expected that, in the long run, salary increases in all parts of the country will be close to the national averages. However, few economists are forecasting a repeat of the high inflation rates experienced in the 1970's. Average salaries in the System increased 3.6% per year, on average, over the last 20 years - a lower pace than the assumed 4.8% a year. We are recommending that the wage inflation assumption be set between 3.5% and 4.8% per year.

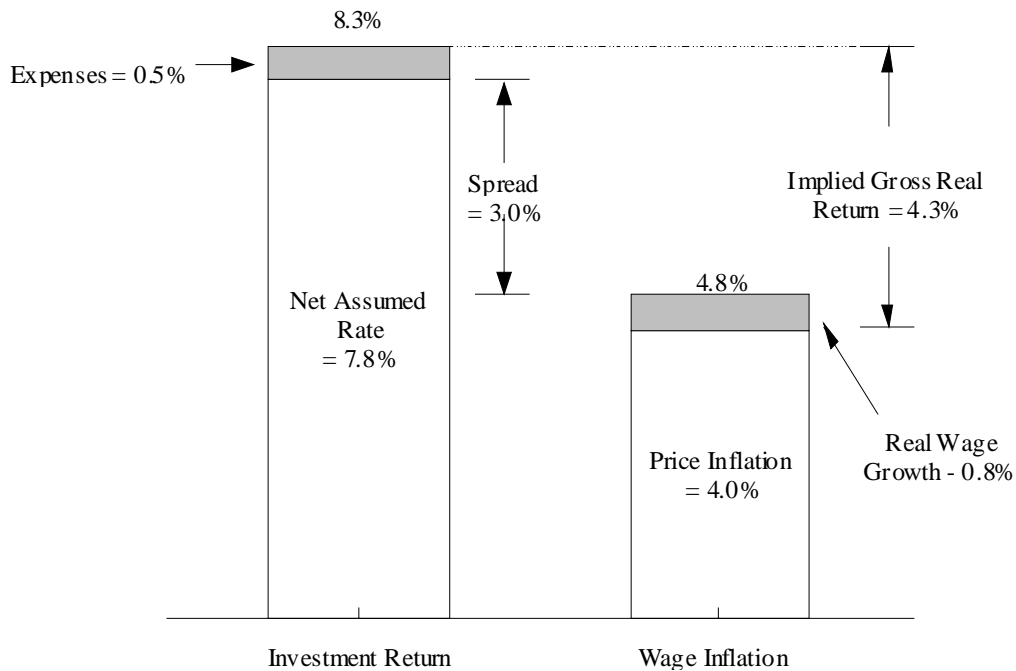
Price Inflation. With regard to inflation, the experience given for 30 and 40 years is influenced by the large annual increases from 1973 to 1982 (inflation averaged almost 10% annually during this period). While inflation defies accurate prediction, it would appear that the recent experience coupled with long term trends would suggest that a 3.0% assumption is reasonable. (In the 2007 OASDI report, the Social Security Administration projects inflation at 2.8% in their intermediate assumptions.)

ECONOMIC ASSUMPTIONS

Investment Return and Spread. The Police and Fire Retirement System’s asset portfolio is a diversified mix of equity and fixed income investments. Real market returns (the spread between recognized net investment return and wage inflation) for balanced portfolios have averaged over 4% over the last 58 years (see schedule on page A-11). Only hindsight will tell whether a particular combination of economic assumptions is optimal.

The current net real return assumption is 3.0% (7.8% nominal less 4.8% wage inflation). When initially set, the 3.0% spread was believed to be within a reasonable range. This spread is now at the low end of the reasonable range, with the following caveat: In some years, a portion of market gains have been distributed to active members and retirees and have offset computed employer contributions. If net returns average 7.8%, but a portion of returns finance additional benefits and/or contribution offsets, net recognized returns for financing purposes will average less than 7.8%. Consideration of a change in this assumption should be made in conjunction with gain sharing policies. We believe a prudent net real return assumption for and Fire Retirement System’s at this point in time is between 3.0% and 4.0%. Adding a 3.0% spread to an underlying wage inflation rate of 4.8% produces the nominal rate of net investment return of 7.8%.

The relationship between economic assumptions based on the current 3.0% spread is illustrated below:



ECONOMIC ASSUMPTIONS

In summary, our recommended range of economic assumptions for the System are as follows:

	<u>Current</u>	<u>Alternate 1</u>	<u>Alternate 2</u>	<u>Alternate 3</u>
Investment Return	7.80%	7.80%	7.50%	7.50%
Wage Inflation	4.80	4.00	4.00	3.50
Spread	3.00	3.80	3.50	4.00

Continuation of a 7.80% investment return assumption would be reasonable in our view. However, a moderate reduction in the assumed rate would also be reasonable in light of the lowered expectations on the part of many forecasters. We would recommend considering a 0.30% reduction in the assumed rate of investment return to 7.50%. Valuation results based upon alternate economic assumptions are shown in Section B.

ECONOMIC ASSUMPTIONS

Recognized Assets. The Funding Value of Assets recognizes assumed investment return fully each year. Differences between actual and assumed investment return are phased-in over a closed 3-year period. During periods when investment performance exceeds the assumed rate, the Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, the Funding Value of Assets will tend to be greater than market value, as it is at the time of this writing. If assumed rates are exactly realized for 2 consecutive years, funding value will become equal to market value. Present market conditions can lead to a situation where the recognized assets might deviate “too much” from the market value. To prevent this, we recommend adding a requirement that the recognized assets must always be between 80% and 120% of the market value.

The chart below shows some relevant asset values.

	<u>Assets in \$Millions at June 30</u>	
	<u>2006</u>	<u>2007</u>
Market Value of Assets	\$4,035	\$4,481
Funding Value of Assets	3,980	4,307
Ratio of Market Value to Funding Value	101%	104%

HISTORICAL PATTERNS OF INVESTMENT RETURN, PAY INCREASES & INFLATION

Calendar Year Period	Gross Market Returns			Stocks (S&P 500)	Price Inflation (CPI)	National Average Earnings (NAE)	Sample Balanced Fund*	
	Bonds (Long)		Cash Equiv. (T Bills)				Total Return (I)	Spread: I - NAE - e
	U.S. Treasury	Corp. (S&P AA)						
1950-1959	(0.1)%	1.0 %	1.9 %	19.4 %	2.2 %	4.5 %	12.2 %	7.2 %
1960-1969	1.4 %	1.7 %	3.9 %	7.8 %	2.5 %	4.3 %	5.7 %	0.9 %
1970-1979	5.5 %	6.2 %	6.3 %	5.9 %	7.4 %	6.9 %	6.2 %	(1.2)%
1980-1989	12.6 %	13.0 %	8.9 %	17.5 %	5.1 %	5.8 %	15.7 %	9.4 %
1990-1999	8.8 %	8.4 %	4.9 %	18.2 %	2.9 %	4.2 %	14.4 %	9.7 %
2000	21.5 %	12.9 %	5.9 %	(9.1)%	3.4 %	5.5 %	1.1 %	(4.9)%
2001	3.7 %	10.7 %	3.8 %	(11.9)%	1.6 %	2.4 %	(4.6)%	(7.5)%
2002	17.8 %	16.3 %	1.7 %	(22.1)%	2.4 %	1.0 %	(7.2)%	(8.7)%
2003	1.5 %	5.3 %	1.0 %	28.7 %	1.9 %	2.4 %	18.4 %	15.5 %
2004	8.5 %	8.7 %	1.2 %	10.9 %	3.3 %	4.7 %	9.6 %	4.4 %
2005	7.8 %	5.9 %	3.0 %	4.9 %	3.4 %	3.7 %	5.5 %	1.3 %
2006	1.2 %	3.2 %	4.8 %	15.8 %	2.5 %	4.6 %	10.4 %	5.3 %
2007	9.9 %	2.6 %	4.7 %	5.5 %	4.1 %	4.7 %	5.9 %	0.7 %
Last 58 Years	6.0 %	6.2 %	4.9 %	11.9 %	3.8 %	4.9 %	9.9 %	4.5 % #

* Sample Balanced Fund	
Equities	60 %
Bonds - Government	20 %
- Corporate	15 %
Cash Equivalents	5 %
	100 %
Fund Expenses (e)	0.50 %

# Historical Spread	
# Observed spread is very sensitive to the observation period, even over longer periods, as illustrated below:	
Observation Period	Spread
57 years	4.5 %
50 years	4.2 %
40 years	4.0 %
30 years	6.3 %

SECTION B

SUMMARY OF THE VALUATION RESULTS

2002-2007 EXPERIENCE STUDY
ILLUSTRATIVE EMPLOYER CONTRIBUTION RATES AS OF JUNE 30, 2007

Police and Fire - 28 Year Amortization Period					
	Current Assumptions	Proposed Demographic and Alternate Economic Assumptions			
Interest Rate Assumption	7.80%	7.80%	7.80%	7.50%	7.50%
Wage Growth Assumption	4.80%	4.80%	4.00%	4.00%	3.50%
Employer Contribution Rate					
Employer Normal Cost	26.71 %	26.70 %	24.66 %	26.24 %	24.93 %
Unfunded Actuarial Accrued Liability *	(9.79)%	(10.37)%	(11.66)%	(8.38)%	(9.07)%
Total Employer Rate	16.92 %	16.33 %	13.00 %	17.86 %	15.86 %
Funded Ratio as of June 30, 2007	110.50 %	111.20 %	111.60 %	108.40 %	108.60 %

* 30 year amortization

Note: It is the Board's policy to set the contribution rate equal to the employer normal cost when the system is more than fully funded. The offset for the Full Funding Credit is shown for illustration purposes to provide an indication of the expected long term differences in contribution rates under alternate economic assumptions.

SECTION C

SALARY INCREASES

MERIT & SENIORITY PAY INCREASES

Service Index	Number	Merit/Seniority % Increase			Total % Increase		
		Actual	Sample Values		Actual	Sample Values	
			Old	New		Old	New
1	147	8.51 %	6.00 %	8.00 %	12.01 %	9.50 %	11.50 %
2	599	6.80 %	6.00 %	7.30 %	10.30 %	9.50 %	10.80 %
3	886	8.38 %	6.00 %	6.60 %	11.88 %	9.50 %	10.10 %
4	1,165	8.75 %	6.00 %	5.90 %	12.25 %	9.50 %	9.40 %
5	1,358	6.52 %	6.00 %	5.20 %	10.02 %	9.50 %	8.70 %
6	1,497	0.67 %	2.00 %	4.50 %	4.17 %	5.50 %	8.00 %
7	1,580	(0.79)%	2.00 %	3.80 %	2.71 %	5.50 %	7.30 %
8	1,370	(0.11)%	2.00 %	3.10 %	3.39 %	5.50 %	6.60 %
9	1,190	(0.62)%	2.00 %	2.40 %	2.88 %	5.50 %	5.90 %
10	1,058	(0.01)%	2.00 %	1.70 %	3.49 %	5.50 %	5.20 %
11	862	(0.19)%	1.00 %	1.00 %	3.31 %	4.50 %	4.50 %
12	676	(1.16)%	1.00 %	1.00 %	2.34 %	4.50 %	4.50 %
13	589	0.09 %	1.00 %	1.00 %	3.59 %	4.50 %	4.50 %
14	497	(0.05)%	1.00 %	1.00 %	3.45 %	4.50 %	4.50 %
15	478	(0.77)%	1.00 %	1.00 %	2.73 %	4.50 %	4.50 %
16	568	0.06 %	1.00 %	1.00 %	3.56 %	4.50 %	4.50 %
17	855	0.98 %	1.00 %	1.00 %	4.48 %	4.50 %	4.50 %
18	990	1.37 %	1.00 %	1.00 %	4.87 %	4.50 %	4.50 %
19	947	(0.12)%	1.00 %	1.00 %	3.38 %	4.50 %	4.50 %
20	960	(1.45)%	1.00 %	1.00 %	2.05 %	4.50 %	4.50 %
21	876	(0.63)%	1.00 %	1.00 %	2.87 %	4.50 %	4.50 %
22	555	0.22 %	1.00 %	1.00 %	3.72 %	4.50 %	4.50 %
23	354	(0.53)%	1.00 %	1.00 %	2.97 %	4.50 %	4.50 %
24	315	(0.23)%	1.00 %	1.00 %	3.27 %	4.50 %	4.50 %
25	252	0.23 %	1.00 %	1.00 %	3.73 %	4.50 %	4.50 %
26	247	0.11 %	1.00 %	1.00 %	3.61 %	4.50 %	4.50 %
27	200	0.83 %	1.00 %	1.00 %	4.33 %	4.50 %	4.50 %
28	213	(0.08)%	1.00 %	1.00 %	3.42 %	4.50 %	4.50 %
29	250	0.28 %	1.00 %	1.00 %	3.78 %	4.50 %	4.50 %
30	281	1.33 %	1.00 %	1.00 %	4.83 %	4.50 %	4.50 %
31	283	1.09 %	1.00 %	1.00 %	4.59 %	4.50 %	4.50 %
32	305	0.77 %	1.00 %	1.00 %	4.27 %	4.50 %	4.50 %
33	278	0.66 %	1.00 %	1.00 %	4.16 %	4.50 %	4.50 %
34	214	1.32 %	1.00 %	1.00 %	4.82 %	4.50 %	4.50 %
35	173	(0.03)%	1.00 %	1.00 %	3.47 %	4.50 %	4.50 %
36	94	0.25 %	1.00 %	1.00 %	3.75 %	4.50 %	4.50 %
37	58	0.26 %	1.00 %	1.00 %	3.76 %	4.50 %	4.50 %
38	35	1.73 %	1.00 %	1.00 %	5.23 %	4.50 %	4.50 %
39	19	1.30 %	1.00 %	1.00 %	4.80 %	4.50 %	4.50 %
40	15	0.52 %	1.00 %	1.00 %	4.02 %	4.50 %	4.50 %
Other	19						
Total	23,289						

SECTION D

RETIREMENT EXPERIENCE

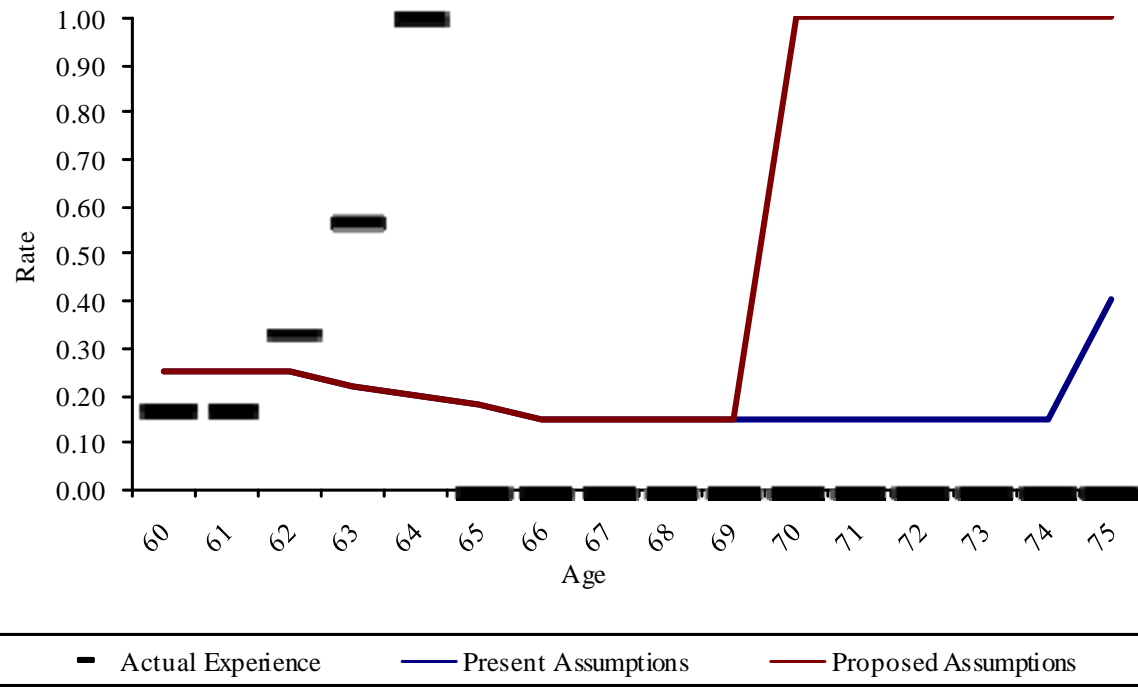
**AGE BASED RETIREMENT EXPERIENCE
POLICE**

Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
60	4	23	0.1739	0.2500	0.2500	6	6
61	4	23	0.1739	0.2500	0.2500	6	6
62	5	15	0.3333	0.2500	0.2500	4	4
63	4	7	0.5714	0.2200	0.2200	2	2
64	3	3	1.0000	0.2000	0.2000	1	1
65	-	-	N\A	0.1800	0.1800	-	-
66	-	-	N\A	0.1500	0.1500	-	-
67	-	-	N\A	0.1500	0.1500	-	-
68	-	-	N\A	0.1500	0.1500	-	-
69	-	-	N\A	0.1500	0.1500	-	-
Total	20	71	0.2817			19	19
70 & Over	-	-	N\A			-	-
Total	20	71	0.2817			19	19

* “Expected Retirements – New” is calculated as the sum of rates applied to exposure at individual ages. “Expected Retirements – Old” is the sum of actual probabilities applied in the valuation.

In addition, 9 members were reported to have retired prior to age 60. These members were thought not to be eligible for the 25 and out service based retirement condition prior to age 60.

AGE BASED RETIREMENT EXPERIENCE POLICE



AGE BASED RETIREMENT EXPERIENCE
FIRE

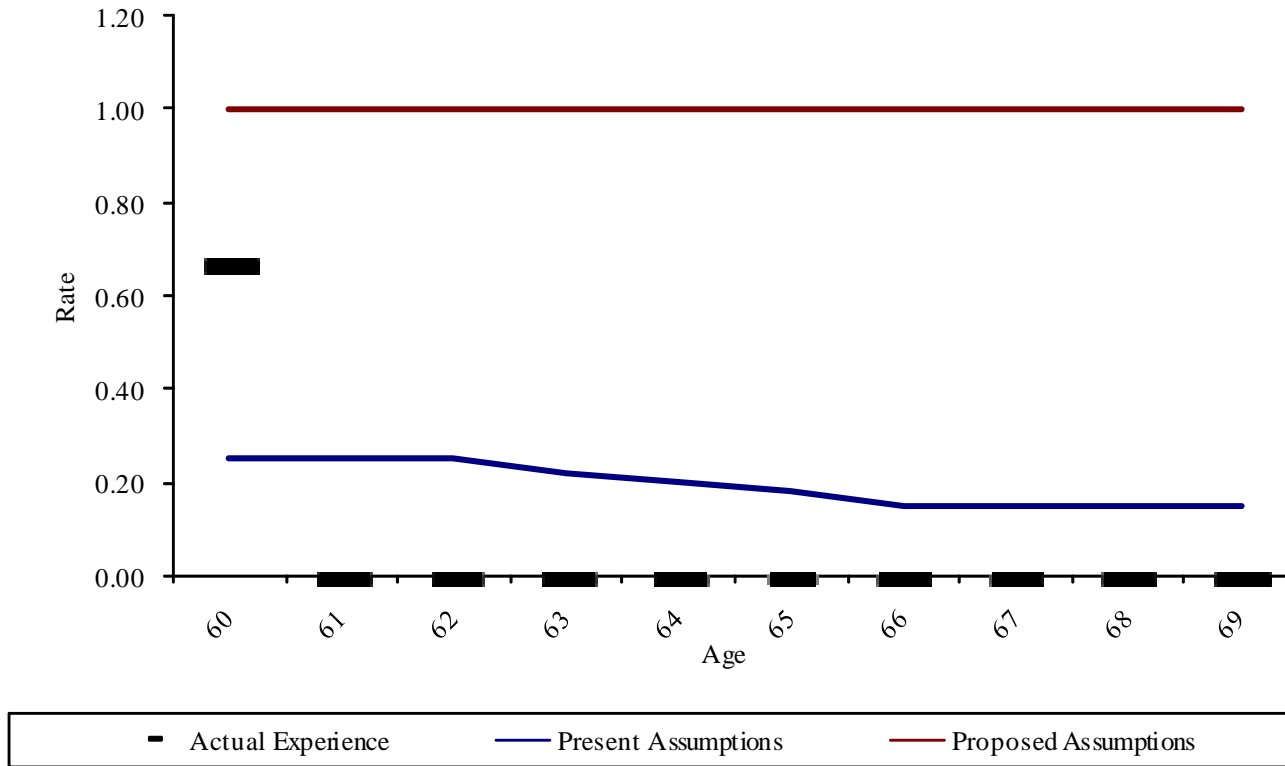
Age	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements*	
				Old	New	Old	New
60	2	3	0.6667	0.2500	1.0000	1	3
61	-	-	N\A	0.2500	1.0000	-	-
62	-	-	N\A	0.2500	1.0000	-	-
63	-	-	N\A	0.2200	1.0000	-	-
64	-	-	N\A	0.2000	1.0000	-	-
65	-	-	N\A	0.1800	1.0000	-	-
66	-	-	N\A	0.1500	1.0000	-	-
67	-	-	N\A	0.1500	1.0000	-	-
68	-	-	N\A	0.1500	1.0000	-	-
69	-	-	N\A	0.1500	1.0000	-	-
Total	2	3	0.6667			1	3
70 & Over	-	-	N\A			-	-
Total	2	3	0.6667			1	3

* “Expected Retirements – New” is calculated as the sum of rates applied to exposure at individual ages. “Expected Retirements – Old” is the sum of actual probabilities applied in the valuation.

In addition, 1 member was reported to have been retired prior to age 60. This member was thought not to be eligible for the 25 and out service based retirement condition prior to age 60.

Firefighters have mandatory retirement at age 60. Therefore, we have set retirement rates equal to 100% at that age.

AGE BASED RETIREMENT EXPERIENCE FIRE



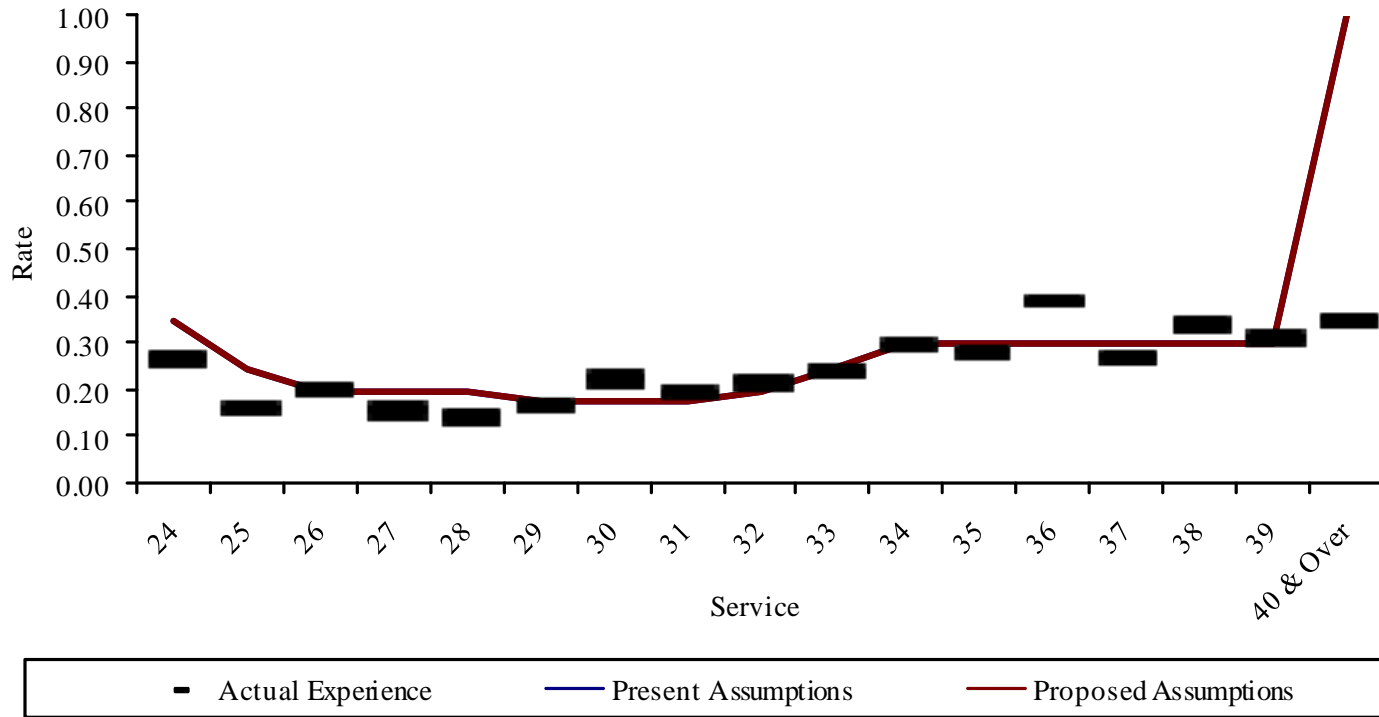
**SERVICE BASED RETIREMENT EXPERIENCE
POLICE**

Service Years*	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements**	
				Old	New	Old	New
24	65	243	0.2675	0.3500	0.3500	85	85
25	33	203	0.1626	0.2500	0.2500	51	51
26	25	122	0.2049	0.2000	0.2000	24	24
27	18	113	0.1593	0.2000	0.2000	23	23
28	19	129	0.1473	0.2000	0.2000	26	26
29	28	167	0.1677	0.1800	0.1800	30	30
30	42	184	0.2283	0.1800	0.1800	33	33
31	46	233	0.1974	0.1800	0.1800	42	42
32	53	239	0.2218	0.2000	0.2000	48	48
33	48	196	0.2449	0.2500	0.2500	49	49
34	52	173	0.3006	0.3000	0.3000	52	52
35	37	130	0.2846	0.3000	0.3000	39	39
36	31	78	0.3974	0.3000	0.3000	23	23
37	13	48	0.2708	0.3000	0.3000	14	14
38	11	32	0.3438	0.3000	0.3000	10	10
39	6	19	0.3158	0.3000	0.3000	6	6
40 & Over	11	31	0.3548	1.0000	1.0000	9	9
Totals	538	2,340	0.2299			564	564

* Measured as integer service nearest whole year at time of decrement.

** "Expected Retirements – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Retirements – Old" is the sum of actual probabilities applied in the valuation.

SERVICE BASED RETIREMENT EXPERIENCE POLICE



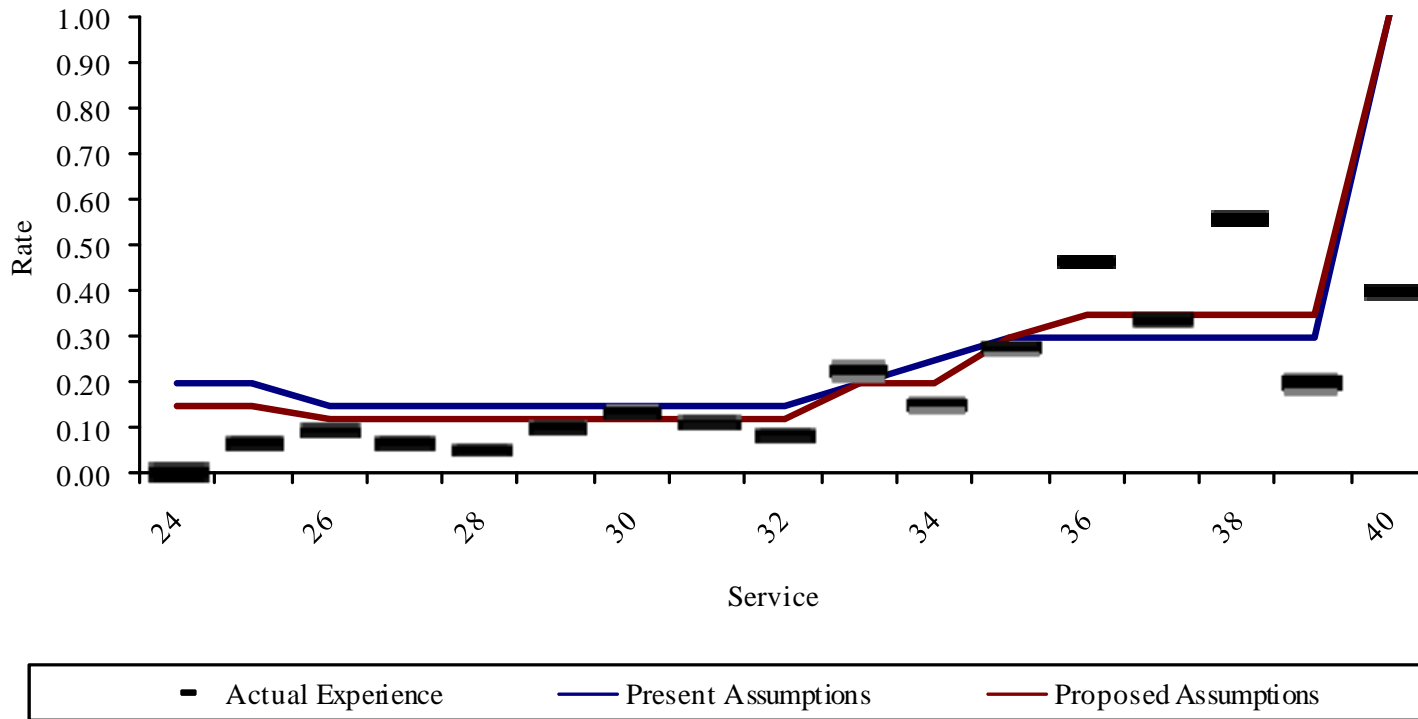
SERVICE BASED RETIREMENT EXPERIENCE
FIRE

Service Years*	Retirements	Exposure	Crude Rates	Sample Rates		Expected Retirements**	
				Old	New	Old	New
24	-	81	0.0000	0.2000	0.1500	16	12
25	8	135	0.0593	0.2000	0.1500	27	20
26	11	123	0.0894	0.1500	0.1200	18	15
27	7	115	0.0609	0.1500	0.1200	17	14
28	6	127	0.0472	0.1500	0.1200	19	15
29	13	137	0.0949	0.1500	0.1200	21	16
30	19	144	0.1319	0.1500	0.1200	22	17
31	15	133	0.1128	0.1500	0.1200	20	16
32	11	131	0.0840	0.1500	0.1200	20	16
33	29	127	0.2283	0.2000	0.2000	25	25
34	15	97	0.1546	0.2500	0.2000	24	19
35	16	57	0.2807	0.3000	0.3000	17	17
36	22	47	0.4681	0.3000	0.3500	14	16
37	8	23	0.3478	0.3000	0.3500	7	8
38	9	16	0.5625	0.3000	0.3500	5	6
39	1	5	0.2000	0.3000	0.3500	2	2
40	4	10	0.4000	1.0000	1.0000	4	4
Totals	194	1,508	0.1286			278	238

* Measured as integer service nearest whole year at time of decrement.

** "Expected Retirements – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Retirements – Old" is the sum of actual probabilities applied in the valuation.

SERVICE BASED RETIREMENT EXPERIENCE FIRE



SECTION E

WITHDRAWAL EXPERIENCE

WITHDRAWAL EXPERIENCE POLICE

There were 235 withdrawals and 3,423 life years of exposure included in the service based (select) withdrawal investigation and 251 withdrawals and 12,751 life years of exposure included in the age based (ultimate) withdrawal investigation. A withdrawal is a separation from active member status for a reason other than disability, death, or retirement and may be either vested or non-vested.

Withdrawal experience was measured by years of service for those terminating with less than 5 years of service and by 5-year age groups for those terminating with 5 or more years of service.

Less Than 5 Years of Service at Assumed Termination (Middle of Year)

Service Index	Withdrawal	Exposure	Crude Rates	Sample Rates		Expected Withdrawals	
				Old	New	Old	New
1	14	135	0.1037	0.0700	0.0850	9	11
2	71	520	0.1365	0.0550	0.0750	29	39
3	57	724	0.0787	0.0400	0.0600	29	43
4	41	937	0.0438	0.0400	0.0500	37	47
5	52	1,107	0.0470	0.0350	0.0450	39	50
Totals	235	3,423	0.0687	0.0418	0.0555	143	190
Ref				154	566		

5 or More Years of Service at Assumed Termination (Middle of Year)

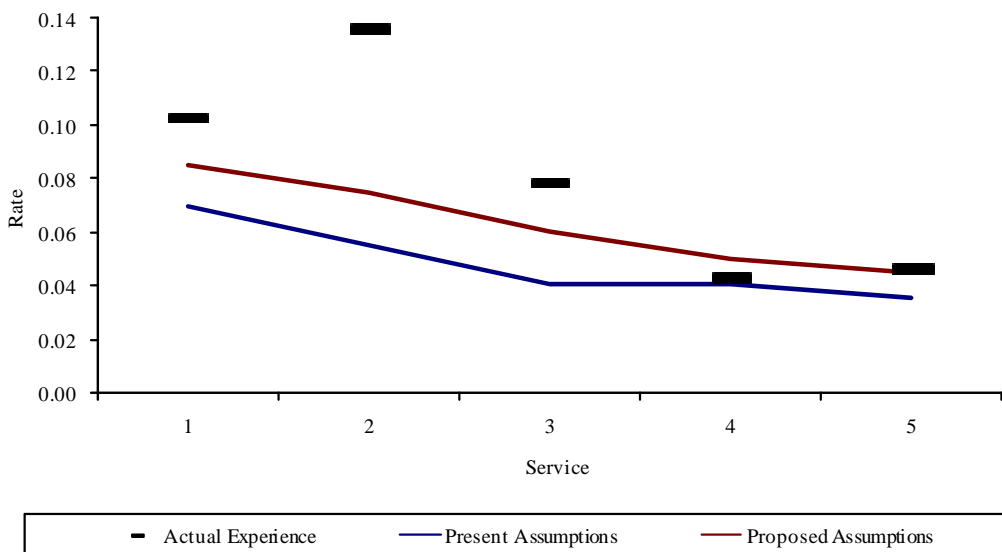
Age	Withdrawal	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N\A	0.0450	0.0450	-	-
20-24	1	27	0.0370	0.0450	0.0450	1	1
25-29	48	1,191	0.0403	0.0430	0.0430	47	47
30-34	86	2,865	0.0300	0.0270	0.0270	78	78
35-39	57	2,864	0.0199	0.0190	0.0190	58	58
40-44	42	2,437	0.0172	0.0160	0.0160	40	40
45-49	11	1,967	0.0056	0.0140	0.0140	27	27
50-54	4	1,133	0.0035	0.0090	0.0090	11	11
55-59	2	267	0.0075	0.0080	0.0080	2	2
60 and over	-	-	N\A			-	-
Totals	251	12,751	0.0197	0.0207	0.0207	264	264
Ref				207	207		

* Sample rates are taken from midpoint of age group.

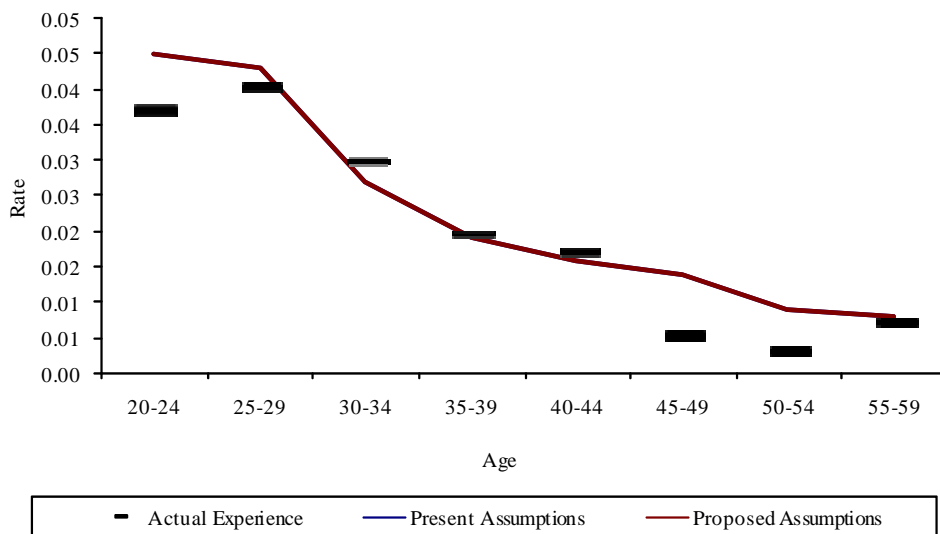
** "Expected Withdrawals – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Withdrawals – Old" is the sum of actual probabilities applied in the valuation.

WITHDRAWAL EXPERIENCE POLICE

Rates of Withdrawal with Less than 5 Years of Service



Rates of Withdrawal with 5 or More Years of Service



WITHDRAWAL EXPERIENCE FIRE

There were 16 withdrawals and 1,001 life years of exposure included in the service based withdrawal investigation and 27 withdrawals and 3,829 life years of exposure included in the age based (ultimate) withdrawal investigation. A withdrawal is a separation from active member status for a reason other than disability, death, or retirement and may be either vested or non-vested.

Withdrawal experience was measured by years of service for those terminating with less than 5 years of service and by 5-year age groups for those terminating with 5 or more years of service.

Less Than 5 Years of Service at Assumed Termination (Middle of Year)

Service Index	Withdrawal	Exposure	Crude Rates	Sample Rates		Expected Withdrawals	
				Old	New	Old	New
1	3	29	0.1034	0.0500	0.0500	1	1
2	11	164	0.0671	0.0400	0.0400	7	7
3	-	224	0.0000	0.0300	0.0300	7	7
4	1	275	0.0036	0.0200	0.0200	6	6
5	1	309	0.0032	0.0200	0.0200	6	6
Totals	16	1,001	0.0160	0.0270	0.0270	27	27
Ref				230	230		

5 or More Years of Service at Assumed Termination (Middle of Year)

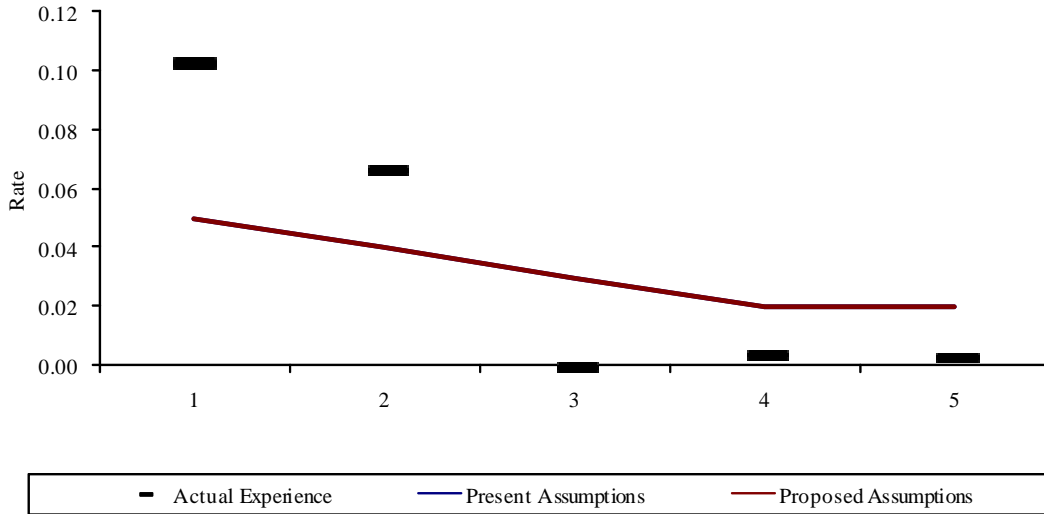
Age	Withdrawal	Exposure	Crude Rates	Sample Rates*		Expected Withdrawals**	
				Old	New	Old	New
Under 20	-	-	N/A	0.0230	0.0196	-	-
20-24	-	3	0.0000	0.0230	0.0196	-	-
25-29	2	188	0.0106	0.0230	0.0196	4	3
30-34	1	604	0.0017	0.0160	0.0136	9	8
35-39	10	1,157	0.0086	0.0110	0.0093	13	11
40-44	7	1,009	0.0069	0.0080	0.0068	8	7
45-49	5	622	0.0080	0.0060	0.0051	4	3
50-54	-	205	0.0000	0.0060	0.0051	1	1
55-59	2	41	0.0488	0.0060	0.0051	-	-
60 and over	-	-	N/A			-	-
Totals	27	3,829	0.0071	0.0102	0.0086	39	33
Ref				113	113		

* Sample rates are taken from midpoint of age group.

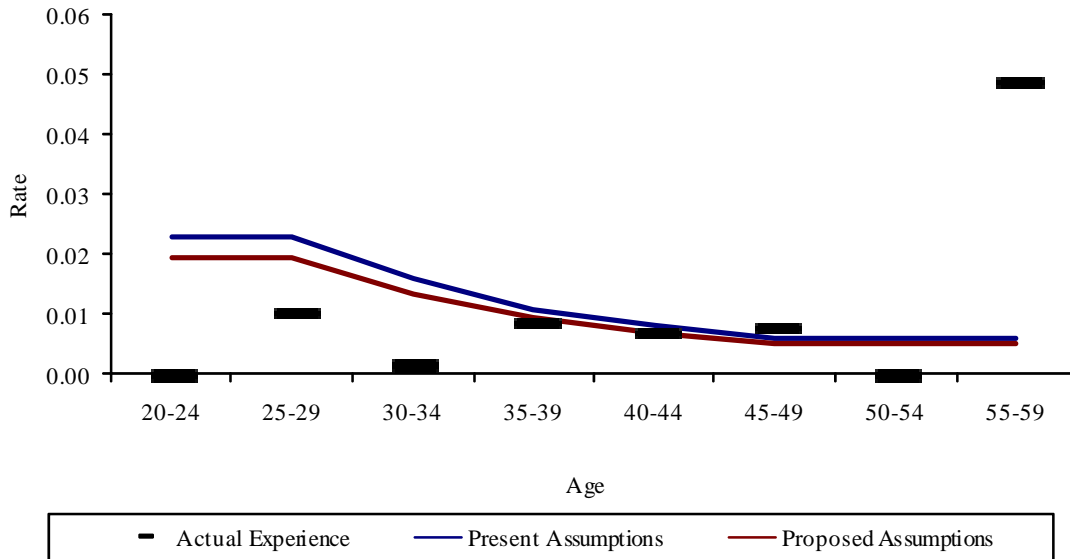
** "Expected withdrawals – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected withdrawals – Old" is the sum of actual probabilities applied in the valuation.

WITHDRAWAL EXPERIENCE FIRE

Rates of Withdrawal with Less than 5 Years of Service



Rates of Withdrawal with 5 or More Years of Service



SECTION F

DISABILITY EXPERIENCE

DUTY DISABILITY EXPERIENCE POLICE

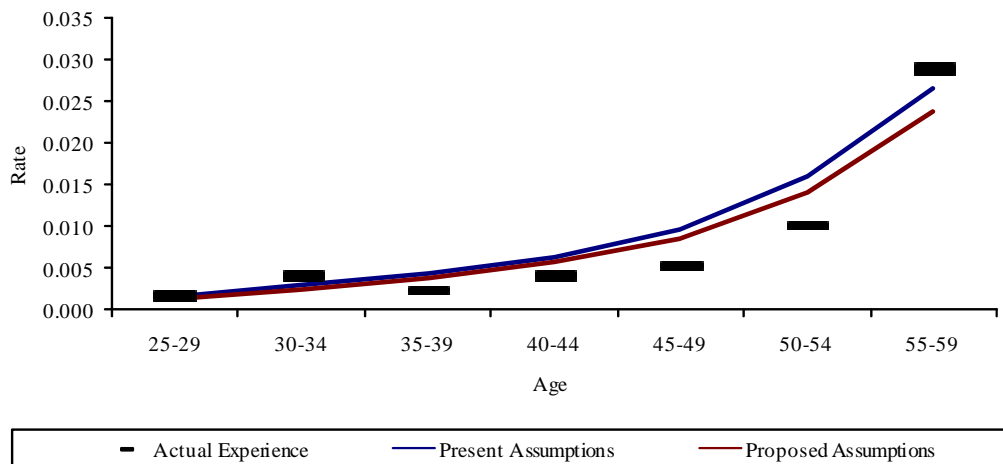
There were 72 disability benefit claims reported for the 5-year period and 16,174 years of exposure (exposure includes all active members regardless of service).

Disability rates were computed by 5-year age groups.

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 25	-	576	0.0000	0.0009	0.0008	1	1
25-29	5	2,534	0.0020	0.0015	0.0014	4	4
30-34	16	3,757	0.0043	0.0028	0.0025	11	10
35-39	9	3,263	0.0028	0.0044	0.0040	14	13
40-44	11	2,590	0.0042	0.0064	0.0057	16	15
45-49	11	2,030	0.0054	0.0097	0.0087	20	18
50-54	12	1,149	0.0104	0.0159	0.0142	18	16
55-59	8	275	0.0291	0.0266	0.0238	7	6
60 and over	-	-				-	-
Totals	72	16,174	0.0045	0.0056	0.0051	91	83
Ref				90	90		

* Sample rates are taken from midpoint of age group.

** "Expected Disabilities – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Disabilities – Old" is the sum of actual probabilities applied in the valuation.



NON-DUTY DISABILITY EXPERIENCE POLICE

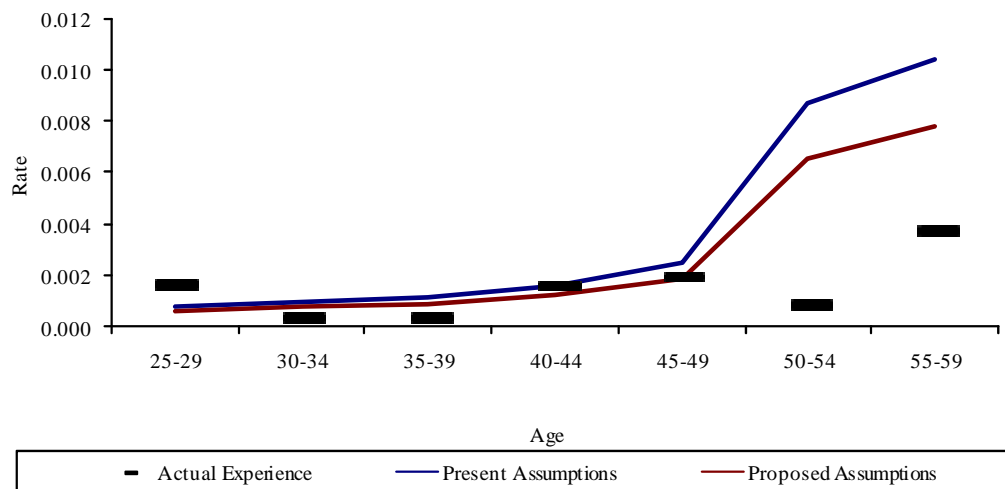
There were 15 disability benefit claims reported for the 5-year period and 12,751 years of exposure (exposure excludes active members with less than 5 years of service).

Disability rates were computed by 5-year age groups.

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 25	-	27	0.0000	0.0008	0.0006	-	-
25-29	2	1,191	0.0017	0.0008	0.0006	1	1
30-34	1	2,865	0.0003	0.0010	0.0008	3	2
35-39	1	2,864	0.0003	0.0012	0.0009	4	3
40-44	4	2,437	0.0016	0.0016	0.0012	4	3
45-49	4	1,967	0.0020	0.0025	0.0019	6	5
50-54	1	1,133	0.0009	0.0087	0.0065	9	7
55-59	1	267	0.0037	0.0104	0.0078	3	2
60 and over	1	-				-	-
Totals	15	12,751	0.0012	0.0024	0.0018	30	23
Ref				105	105		

* Sample rates are taken from midpoint of age group.

** "Expected disabilities – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected disabilities – Old" is the sum of actual probabilities applied in the valuation.



DUTY DISABILITY EXPERIENCE FIRE

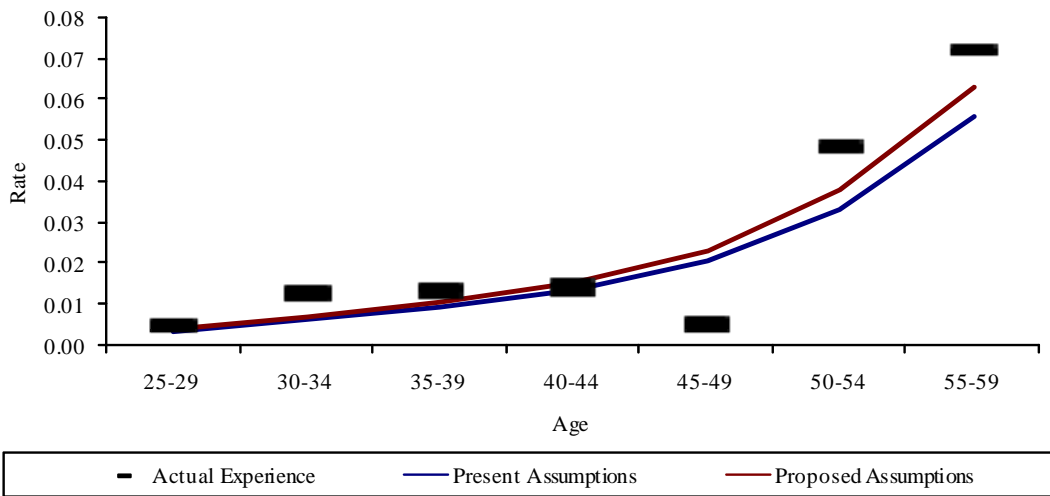
There were 68 disability benefit claims reported for the 5-year period and 4,830 years of exposure (exposure includes all active members regardless of service).

Disability rates were computed by 5-year age groups.

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 25	-	116	0.0000	0.0018	0.0020	-	-
25-29	3	546	0.0055	0.0032	0.0036	2	2
30-34	12	925	0.0130	0.0059	0.0067	6	6
35-39	18	1,282	0.0140	0.0094	0.0105	12	14
40-44	16	1,078	0.0148	0.0134	0.0151	14	16
45-49	4	637	0.0063	0.0204	0.0230	13	14
50-54	10	205	0.0488	0.0335	0.0376	7	7
55-59	3	41	0.0732	0.0560	0.0630	2	2
60 and over	2	-				-	-
Totals	68	4,830	0.0141	0.0116	0.0126	56	61
Ref				90	90		

* Sample rates are taken from midpoint of age group.

** "Expected Disabilities – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Disabilities – Old" is the sum of actual probabilities applied in the valuation.



NON-DUTY DISABILITY EXPERIENCE FIRE

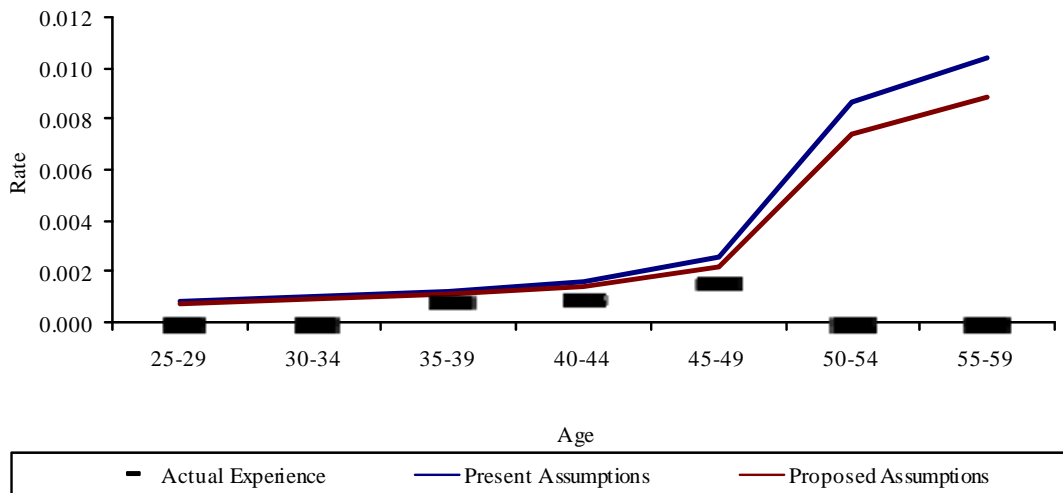
There were 3 disability benefit claims reported for the 5-year period and 3,829 years of exposure (exposure excludes active members with less than 5 years of service).

Disability rates were computed by 5-year age groups.

Age	Disabilities	Exposure	Crude Rates	Sample Rates*		Expected Disabilities**	
				Old	New	Old	New
Under 25	-	3	0.0000	0.0008	0.0007	-	-
25-29	-	188	0.0000	0.0008	0.0007	-	-
30-34	-	604	0.0000	0.0010	0.0009	1	1
35-39	1	1,157	0.0009	0.0012	0.0010	1	1
40-44	1	1,009	0.0010	0.0016	0.0014	2	1
45-49	1	622	0.0016	0.0025	0.0021	2	2
50-54	-	205	0.0000	0.0087	0.0074	2	1
55-59	-	41	0.0000	0.0104	0.0088	-	-
60 and over	-	-	-	-	-	-	-
Totals	3	3,829	0.0008	0.0021	0.0016	8	6
Ref				105	105		

* Sample rates are taken from midpoint of age group.

** "Expected Disabilities – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Disabilities – Old" is the sum of actual probabilities applied in the valuation.



SECTION G

MORTALITY EXPERIENCE

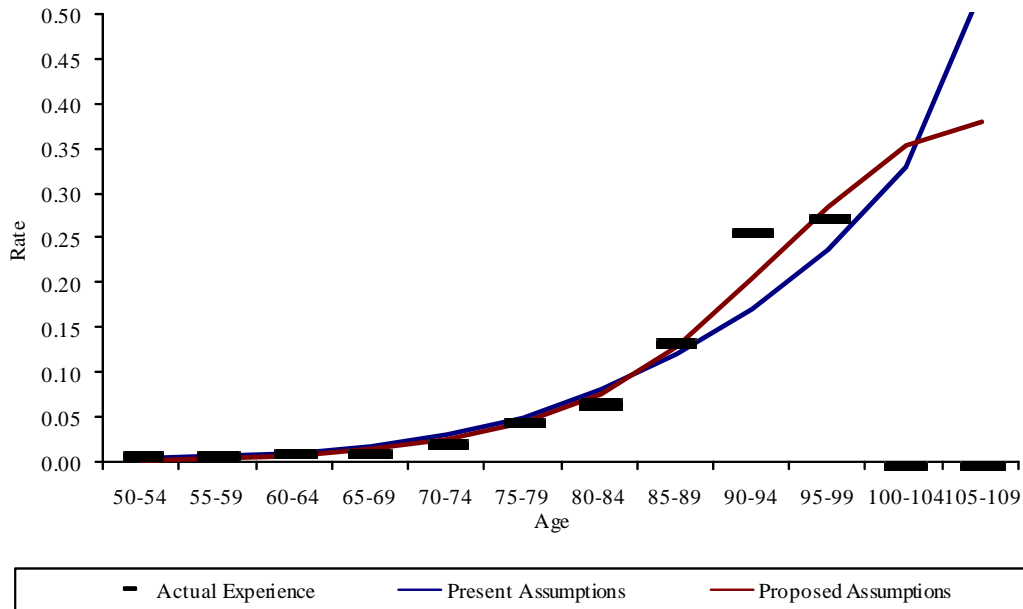
MALE RETIRED-LIFE MORTALITY EXPERIENCE (NORMAL RETIREMENT, ORIGINAL ANNUITANTS ONLY)

There were 857 member deaths reported for the 5-year period and 28,188 life years of exposure included in the male retired-life mortality investigation.

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	29	2,723	0.010650	0.004280	0.002534	12	8
55-59	72	6,342	0.011353	0.006425	0.004458	41	31
60-64	74	5,447	0.013585	0.010020	0.008319	55	48
65-69	43	2,997	0.014348	0.017824	0.015271	53	47
70-74	60	2,506	0.023943	0.030033	0.025917	78	71
75-79	191	3,922	0.048700	0.049282	0.044561	202	187
80-84	172	2,550	0.067451	0.080388	0.076462	207	201
85-89	145	1,079	0.134384	0.120483	0.129241	131	142
90-94	50	193	0.259067	0.171414	0.205775	32	39
95-99	8	29	0.275862	0.237559	0.284859	7	8
100-104	-	-	N/A	0.328547	0.353101	-	-
105-109	-	2	0.000000	0.527866	0.380000	1	1
Other	13	398	0.032663			1	2
Totals	857	28,188	0.030403	0.029090	0.027849	820	785

* Sample rates are taken from midpoint of age group.

** "Expected Deaths – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Deaths – Old" is the sum of actual probabilities applied in the valuation.



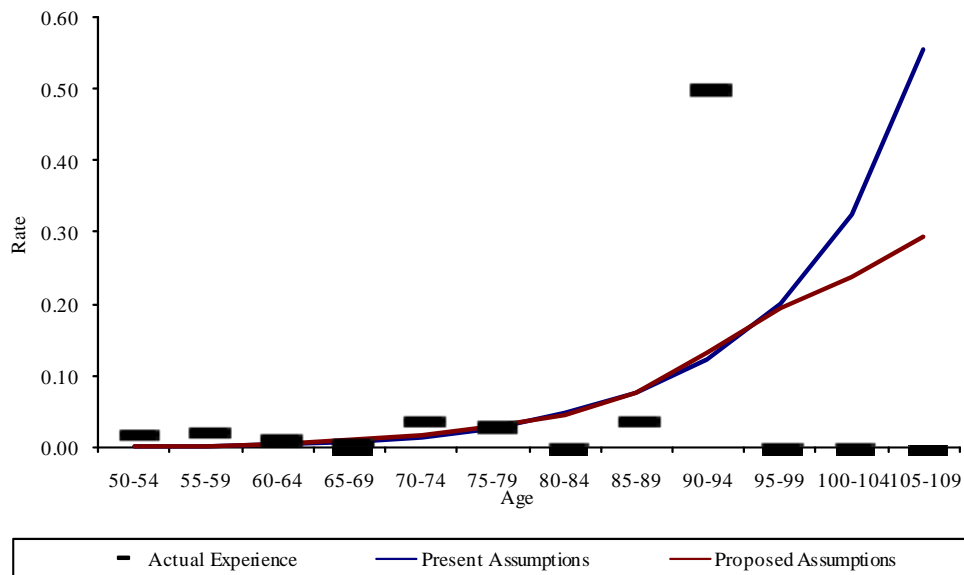
FEMALE RETIRED-LIFE MORTALITY EXPERIENCE (NORMAL RETIREMENT, ORIGINAL ANNUITANTS ONLY)

There were 57 member deaths reported for the 5-year period and 3,166 life years of exposure included in the female retired-life mortality investigation.

Age	Deaths	Exposure	Crude Rates	Sample Rates*		Expected Deaths**	
				Old	New	Old	New
50-54	17	898	0.018931	0.001754	0.001676	2	2
55-59	24	1,041	0.023055	0.002793	0.002717	3	3
60-64	6	512	0.011719	0.004689	0.005055	2	3
65-69	1	156	0.006410	0.007813	0.009706	1	2
70-74	2	51	0.039216	0.014544	0.016742	1	1
75-79	2	64	0.031250	0.027605	0.028106	2	2
80-84	-	74	0.000000	0.047422	0.045879	4	4
85-89	1	26	0.038462	0.075483	0.077446	2	2
90-94	1	2	0.500000	0.122067	0.131682	-	-
95-99	-	-	N\A	0.199839	0.194509	-	-
100-104	-	1	0.000000	0.323007	0.237467	-	-
105-109	-	-	N\A	0.552878	0.293116	-	-
Other	3	341	0.008798			-	1
Totals	57	3,166	0.018004	0.005370	0.006317	17	20

* Sample rates are taken from midpoint of age group.

** "Expected Deaths – New" is calculated as the sum of rates applied to exposure at individual ages. "Expected Deaths – Old" is the sum of actual probabilities applied in the valuation.



**COMPARISON OF SINGLE LIFE RETIREMENT VALUES
7.80% INTEREST**

**PRESENT ASSUMPTIONS
(BASED ON 1983 GROUP ANNUITY MORTALITY)**

Sample Attained Ages	Present Value of \$1.00 Monthly Increasing "X"% Annually After Retirement				Future Life Expectancy (years)	
	2.25% Simple		2.25% Compound		Men	Women
	Men	Women	Men	Women		
45	\$ 173.68	\$ 183.84	\$ 180.93	\$ 192.80	34.78	40.65
50	164.33	176.80	170.22	184.37	30.19	35.86
55	153.16	167.82	157.74	173.98	25.79	31.15
60	139.67	156.56	143.05	161.34	21.55	26.56
65	123.81	142.81	126.15	146.31	17.54	22.13
70	106.82	126.42	108.33	128.82	13.96	17.93
75	89.48	108.30	90.39	109.81	10.84	14.10
80	72.72	90.12	73.24	91.01	8.23	10.84

**PROPOSED ASSUMPTIONS
(BASED ON RP-2000 COMBINED)
(95% OF MALE RATES SET-BACK 0 YEARS)
(100% OF FEMALE RATES SET-BACK 2 YEARS)**

Sample Attained Ages	Present Value of \$1.00 Monthly Increasing "X"% Annually After Retirement				Future Life Expectancy (years)	
	2.25% Simple		2.25% Compound		Men	Women
	Men	Women	Men	Women		
45	\$ 177.10	\$ 183.23	\$ 184.70	\$ 192.08	35.97	40.28
50	168.12	175.97	174.30	183.42	31.24	35.49
55	156.69	166.63	161.49	172.67	26.61	30.77
60	142.79	154.89	146.30	159.57	22.16	26.17
65	126.77	140.89	129.18	144.32	18.00	21.78
70	109.24	125.21	110.77	127.57	14.23	17.75
75	90.61	108.05	91.49	109.57	10.88	14.08
80	71.95	90.11	72.41	91.00	8.02	10.85

SECTION H

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

PROPOSED MISCELLANEOUS AND TECHNICAL ASSUMPTIONS

Marriage Assumption:	We recommend that the marriage assumption remain unchanged at 100% for purposes of death-in-service benefits.
Pay Increase Timing:	End of (Fiscal) year.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service is used to determine the amount of benefit payable.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Normal Form of Benefit:	The assumed normal form of benefit is the straight life form.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year. Employer contributions are assumed to be received on the last day of the fiscal year.
Longevity in AFC:	Longevity payments included in the computation of Average Final Compensation were assumed to increase age and service costs by 4% and disability and death-in-service costs by 2%.
Unused Sick Leave Payout:	Unused sick leave payout was assumed to increase future costs by .05% of payroll.

SECTION I
ASSUMPTION LISTING

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

**SELECT AND ULTIMATE WITHDRAWAL
POLICE**

Less than 10 Years of Service		
Service Index	Male	Female
1	0.0850	0.0850
2	0.0750	0.0750
3	0.0600	0.0600
4	0.0500	0.0500
5	0.0450	0.0450
Sw	566	566

10 or More Years of Service		
Age	Male	Female
25	0.0450	0.0450
26	0.0440	0.0440
27	0.0430	0.0430
28	0.0390	0.0390
29	0.0360	0.0360
30	0.0330	0.0330
36	0.0210	0.0210
37	0.0190	0.0190
38	0.0190	0.0190
39	0.0180	0.0180
40	0.0170	0.0170
41	0.0170	0.0170
42	0.0160	0.0160
43	0.0160	0.0160
44	0.0150	0.0150
45	0.0150	0.0150
46	0.0140	0.0140
47	0.0140	0.0140
48	0.0130	0.0130
49	0.0120	0.0120
50	0.0110	0.0110
51	0.0090	0.0090
52	0.0090	0.0090
53	0.0090	0.0090
54	0.0090	0.0090
W _x	207	207
W _x Mult	100%	100%

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

**SELECT AND ULTIMATE WITHDRAWAL
FIRE**

Less than 10 Years of Service		
Service Index	Male	Female
1	0.0500	0.0500
2	0.0400	0.0400
3	0.0300	0.0300
4	0.0200	0.0200
5	0.0200	0.0200
6	0.0000	0.0000
7	0.0000	0.0000
8	0.0000	0.0000
9	0.0000	0.0000
10	0.0000	0.0000
Sw	230	230

10 or More Years of Service		
Age	Male	Female
25	0.0196	0.0196
26	0.0196	0.0196
27	0.0196	0.0196
28	0.0178	0.0178
29	0.0161	0.0161
30	0.0161	0.0161
31	0.0145	0.0145
32	0.0136	0.0136
33	0.0119	0.0119
34	0.0119	0.0119
35	0.0111	0.0111
36	0.0102	0.0102
37	0.0093	0.0093
38	0.0085	0.0085
39	0.0076	0.0076
40	0.0076	0.0076
41	0.0068	0.0068
42	0.0068	0.0068
43	0.0060	0.0060
44	0.0060	0.0060
45	0.0060	0.0060
46	0.0051	0.0051
47	0.0051	0.0051
48	0.0051	0.0051
49	0.0051	0.0051
50& over	0.0051	0.0051
Wx	113	113
Wx Mult	85%	85%

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

**SERVICE BASED SALARY SCALE
POLICE AND FIRE**

% Merit Increases in Salaries Next Year	
Service Index	Rate
1	8.0%
2	7.3%
3	6.6%
4	5.9%
5	5.2%
6	4.5%
7	3.8%
8	3.1%
9	2.4%
10	1.7%
11	1.0%
12	1.0%
13	1.0%
14	1.0%
15	1.0%
16	1.0%
17	1.0%
18	1.0%
19	1.0%
20	1.0%
21	1.0%
22	1.0%
23	1.0%
24	1.0%
25	1.0%
26	1.0%
27	1.0%
28	1.0%
29	1.0%
30	1.0%
31	1.0%
32	1.0%
33	1.0%
34	1.0%
35	1.0%
36	1.0%
37	1.0%
38	1.0%
39	1.0%
40	1.0%

Ref 306

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

**NORMAL RETIREMENT
POLICE**

Age	% Retiring	
	Male	Female
60	25%	25%
61	25%	25%
62	25%	25%
63	22%	22%
64	20%	20%
65	18%	18%
66	15%	15%
67	15%	15%
68	15%	15%
69	15%	15%
70	100%	100%
71	100%	100%
72	100%	100%
73	100%	100%
74	100%	100%
75	100%	100%
76	100%	100%
77	100%	100%
78	100%	100%
79	100%	100%
80	100%	100%
Rx anchor	1638 60	1638 60

Service	% Retiring	
	Male	Female
24	35%	35%
25	25%	25%
26	20%	20%
27	20%	20%
28	20%	20%
29	18%	18%
30	18%	18%
31	18%	18%
32	20%	20%
33	25%	25%
34	30%	30%
35	30%	30%
36	30%	30%
37	30%	30%
38	30%	30%
39	30%	30%
40	100%	100%
41	100%	100%
42	100%	100%
43	100%	100%
44	100%	100%
45	100%	100%
46	100%	100%
47	100%	100%
48	100%	100%
49	100%	100%
50	100%	100%
51	100%	100%
52	100%	100%
53	100%	100%
54	100%	100%
55	100%	100%
56	100%	100%
57	100%	100%
58	100%	100%
59	100%	100%
Rx anchor	823 24	823 24

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

**NORMAL RETIREMENT
FIRE**

Age	% Retiring	
	Male	Female
60	100%	100%
61	100%	100%
62	100%	100%
63	100%	100%
64	100%	100%
65	100%	100%
66	100%	100%
67	100%	100%
68	100%	100%
69	100%	100%
70	100%	100%
71	100%	100%
72	100%	100%
73	100%	100%
74	100%	100%
75	100%	100%
76	100%	100%
77	100%	100%
78	100%	100%
79	100%	100%
80	100%	100%
Rx anchor	1 60	1 60

Service	% Retiring	
	Male	Female
24	15%	15%
25	15%	15%
26	12%	12%
27	12%	12%
28	12%	12%
29	12%	12%
30	12%	12%
31	12%	12%
32	12%	12%
33	20%	20%
34	20%	20%
35	30%	30%
36	35%	35%
37	35%	35%
38	35%	35%
39	35%	35%
40	100%	100%
41	100%	100%
42	100%	100%
43	100%	100%
44	100%	100%
45	100%	100%
46	100%	100%
47	100%	100%
48	100%	100%
49	100%	100%
50	100%	100%
51	100%	100%
52	100%	100%
53	100%	100%
54	100%	100%
55	100%	100%
56	100%	100%
57	100%	100%
58	100%	100%
59	100%	100%
Rx anchor	1639 24	1639 24

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

**DISABILITY RATES
POLICE**

Age	% Becoming Non-Duty Disabled		Age	% Becoming Duty Disabled	
	Male	Female		Male	Female
20	0.06%	0.06%	20	0.07%	0.07%
21	0.06%	0.06%	21	0.07%	0.07%
22	0.06%	0.06%	22	0.07%	0.07%
23	0.06%	0.06%	23	0.10%	0.10%
24	0.06%	0.06%	24	0.11%	0.11%
25	0.06%	0.06%	25	0.11%	0.11%
26	0.06%	0.06%	26	0.12%	0.12%
27	0.06%	0.06%	27	0.12%	0.12%
28	0.06%	0.06%	28	0.13%	0.13%
29	0.07%	0.07%	29	0.15%	0.15%
30	0.07%	0.07%	30	0.17%	0.17%
31	0.07%	0.07%	31	0.20%	0.20%
32	0.08%	0.08%	32	0.22%	0.22%
33	0.08%	0.08%	33	0.25%	0.25%
34	0.08%	0.08%	34	0.28%	0.28%
35	0.08%	0.08%	35	0.30%	0.30%
36	0.09%	0.09%	36	0.33%	0.33%
37	0.09%	0.09%	37	0.35%	0.35%
38	0.10%	0.10%	38	0.38%	0.38%
39	0.10%	0.10%	39	0.40%	0.40%
40	0.10%	0.10%	40	0.43%	0.43%
41	0.11%	0.11%	41	0.47%	0.47%
42	0.12%	0.12%	42	0.50%	0.50%
43	0.13%	0.13%	43	0.54%	0.54%
44	0.14%	0.14%	44	0.59%	0.59%
45	0.16%	0.16%	45	0.64%	0.64%
46	0.17%	0.17%	46	0.70%	0.70%
47	0.19%	0.19%	47	0.77%	0.77%
48	0.28%	0.28%	48	0.84%	0.84%
49	0.37%	0.37%	49	0.92%	0.92%
50	0.47%	0.47%	50	1.02%	1.02%
51	0.56%	0.56%	51	1.13%	1.13%
52	0.65%	0.65%	52	1.25%	1.25%
53	0.67%	0.67%	53	1.40%	1.40%
54	0.70%	0.70%	54	1.55%	1.55%
55	0.73%	0.73%	55	1.73%	1.73%
56	0.75%	0.75%	56	1.91%	1.91%
57	0.78%	0.78%	57	2.10%	2.10%
58	0.79%	0.79%	58	2.27%	2.27%
59	0.81%	0.81%	59	2.42%	2.42%
60	0.82%	0.82%	60	2.49%	2.49%
Hx	105	105	Hx	90	90
Mult	75%	75%	Mult	85%	85%

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

**DISABILITY RATES
FIRE**

Age	% Becoming Non-Duty Disabled		Age	% Becoming Duty Disabled	
	Male	Female		Male	Female
20	0.07%	0.07%	20	0.08%	0.08%
21	0.07%	0.07%	21	0.08%	0.08%
22	0.07%	0.07%	22	0.08%	0.08%
23	0.07%	0.07%	23	0.12%	0.12%
24	0.07%	0.07%	24	0.13%	0.13%
25	0.07%	0.07%	25	0.13%	0.13%
26	0.07%	0.07%	26	0.13%	0.13%
27	0.07%	0.07%	27	0.14%	0.14%
28	0.07%	0.07%	28	0.15%	0.15%
29	0.08%	0.08%	29	0.17%	0.17%
30	0.08%	0.08%	30	0.19%	0.19%
31	0.08%	0.08%	31	0.22%	0.22%
32	0.09%	0.09%	32	0.25%	0.25%
33	0.09%	0.09%	33	0.28%	0.28%
34	0.09%	0.09%	34	0.31%	0.31%
35	0.09%	0.09%	35	0.34%	0.34%
36	0.10%	0.10%	36	0.37%	0.37%
37	0.10%	0.10%	37	0.40%	0.40%
38	0.11%	0.11%	38	0.43%	0.43%
39	0.12%	0.12%	39	0.46%	0.46%
40	0.12%	0.12%	40	0.49%	0.49%
41	0.13%	0.13%	41	0.53%	0.53%
42	0.14%	0.14%	42	0.57%	0.57%
43	0.14%	0.14%	43	0.62%	0.62%
44	0.16%	0.16%	44	0.67%	0.67%
45	0.18%	0.18%	45	0.73%	0.73%
46	0.20%	0.20%	46	0.79%	0.79%
47	0.21%	0.21%	47	0.87%	0.87%
48	0.31%	0.31%	48	0.95%	0.95%
49	0.42%	0.42%	49	1.05%	1.05%
50	0.53%	0.53%	50	1.16%	1.16%
51	0.63%	0.63%	51	1.28%	1.28%
52	0.74%	0.74%	52	1.42%	1.42%
53	0.76%	0.76%	53	1.58%	1.58%
54	0.79%	0.79%	54	1.76%	1.76%
55	0.82%	0.82%	55	1.96%	1.96%
56	0.85%	0.85%	56	2.17%	2.17%
57	0.88%	0.88%	57	2.38%	2.38%
58	0.90%	0.90%	58	2.58%	2.58%
59	0.92%	0.92%	59	2.74%	2.74%
60	0.93%	0.93%	60	2.82%	2.82%
Hx	105	105	Hx	90	90
Mult	85%	85%	Mult	225%	225%

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

POST RETIREMENT MORTALITY RATES

Age	% Dying Next Year		Age	% Dying Next Year	
	Male	Female		Male	Female
50	0.2031%	0.1434%	81	6.8439%	4.1506%
51	0.2327%	0.1550%	82	7.6462%	4.5879%
52	0.2534%	0.1676%	83	8.5232%	5.0780%
53	0.2770%	0.1852%	84	9.4790%	5.6294%
54	0.3036%	0.2018%	85	10.5219%	6.2506%
55	0.3443%	0.2207%	86	11.6657%	6.9517%
56	0.3990%	0.2424%	87	12.9241%	7.7446%
57	0.4458%	0.2717%	88	14.3061%	8.6376%
58	0.5009%	0.3090%	89	15.8099%	9.6337%
59	0.5648%	0.3478%	90	17.4238%	10.7303%
60	0.6410%	0.3923%	91	18.9781%	11.9154%
61	0.7292%	0.4441%	92	20.5775%	13.1682%
62	0.8319%	0.5055%	93	22.1979%	14.4604%
63	0.9511%	0.5814%	94	23.8158%	15.7618%
64	1.0716%	0.6657%	95	25.4116%	17.0433%
65	1.2100%	0.7648%	96	26.9710%	18.2799%
66	1.3689%	0.8619%	97	28.4859%	19.4509%
67	1.5271%	0.9706%	98	29.9531%	20.5379%
68	1.6977%	1.0954%	99	31.3697%	21.5240%
69	1.8812%	1.2163%	100	32.7328%	22.3947%
70	2.1096%	1.3445%	101	34.0697%	23.1387%
71	2.3341%	1.4860%	102	35.3101%	23.7467%
72	2.5917%	1.6742%	103	36.3888%	24.4834%
73	2.8868%	1.8579%	104	37.2403%	25.4498%
74	3.2205%	2.0665%	105	37.7992%	26.6044%
75	3.5942%	2.2970%	106	38.0000%	27.9055%
76	4.0061%	2.5458%	107	38.0000%	29.3116%
77	4.4561%	2.8106%	108	38.0000%	30.7811%
78	4.9517%	3.0966%	109	38.0000%	32.2725%
79	5.5031%	3.4105%	110	100.0000%	100.0000%
80	6.1150%	3.7595%	Ref	#506sb0x0.95	#507sb2x1

**ACTUARIAL ASSUMPTIONS
BASED ON 2002-2007 EXPERIENCE STUDY**

PRE RETIREMENT MORTALITY RATES

Age	% Dying Next Year	
	Male	Female
20	0.0259%	0.0141%
21	0.0268%	0.0143%
22	0.0274%	0.0143%
23	0.0280%	0.0144%
24	0.0282%	0.0145%
25	0.0282%	0.0148%
26	0.0283%	0.0151%
27	0.0286%	0.0155%
28	0.0295%	0.0160%
29	0.0309%	0.0167%
30	0.0333%	0.0176%
31	0.0374%	0.0186%
32	0.0421%	0.0198%
33	0.0473%	0.0230%
34	0.0526%	0.0262%
35	0.0580%	0.0296%
36	0.0631%	0.0326%
37	0.0678%	0.0356%
38	0.0723%	0.0386%
39	0.0766%	0.0416%
40	0.0809%	0.0449%
41	0.0856%	0.0486%
42	0.0911%	0.0530%
43	0.0974%	0.0581%
44	0.1048%	0.0639%
45	0.1131%	0.0703%
46	0.1212%	0.0772%
47	0.1301%	0.0843%
48	0.1395%	0.0917%
49	0.1496%	0.0994%
50	0.1603%	0.1075%
51	0.1837%	0.1163%
52	0.2000%	0.1257%
53	0.2187%	0.1389%
54	0.2397%	0.1513%
55	0.2718%	0.1655%
56	0.3150%	0.1818%
57	0.3520%	0.2038%
58	0.3955%	0.2318%
59	0.4459%	0.2608%
60	0.5060%	0.2942%
61	0.5757%	0.3331%
62	0.6568%	0.3791%
63	0.7509%	0.4361%
64	0.8460%	0.4993%
65	0.9553%	0.5736%
Ref	#506sb0x0.75	#507sb2x0.75

SECTION J
GLOSSARY

GLOSSARY

The following glossary is intended to provide definitions of a number of terms which are used throughout this report and which are somewhat unique to the discussion of an Experience Study.

Actual Decrement. The actual number of decrements which occurred during the study. This number is a straight tabulation of the actual number of occurrences of the particular decrement in question. Normally, the actual number of decrements will be subdivided by age and sex, and possibly by service.

Aggregate Assumptions. Assumptions which vary only by sex and/or age. The impact of service on the decrement is ignored. All experience is combined by age and/or sex without regard to service. Rates of death and disablement are more appropriate to aggregate measurement in a retirement system.

Crude Rate of Decrement. The rate of decrement determined by dividing the actual number of the respective decrement for that age/service and sex by the corresponding exposure for that age/service and sex. The rate is described as a crude rate because no smoothing or elimination of statistical fluctuations has been made. It is indicative of the underlying true rate of the decrement and is the basis used in graduation to obtain the graduated or tabular rate.

Decrements. The decrements are the means by which a member ceases to be a member. For active members, the decrements are death, withdrawal, retirement, and disability retirement. For retired members, the only decrement is death. The purpose of the Experience Study is to determine the underlying rates of each decrement.

Expected Decrement. This is the number of occurrences of a given decrement expected to occur for a given age/service and sex based on the number of lives exposed to the risk of the particular decrement and the current assumed rate for that decrement. It may also be referred to as the tabular number of decrements. It is the number of deaths, withdrawals, retirements, or disabilities (whichever is applicable) that would have actually occurred had the actuarial assumptions been exactly realized.

Exposure. The number of lives exposed to a given risk of decrement for a particular age (and service) and sex. It represents the number of members who could have potentially died, retired, become disabled, or withdrawn at that particular age/service and for that particular sex. This term will also be described as “the number exposed to a given risk.”

Graduated Rates. Graduation is the mathematical process by which a set of crude rates of a particular type is translated into graduated or tabular rates. The graduation process attempts to smooth out statistical fluctuations and to arrive at a set of rates that adequately fit the underlying actual experience of the crude rates that are being graduated. The graduation process involves smoothing the results, but at the same time trying to fit the results to be consistent with the original data. It requires that the actuary exercise his or her judgment in what the underlying shape of the risk curve should look like.

Interpolated Rates. For the active rates of decrement (death, disability, retirement, and withdrawal), the actuary will develop graduated rates based on quinquennial age groupings (see definition). To arrive at the rates of decrement for ages between two quinquennial ages, the graduated quinquennial rates must be interpolated for these intermediate ages. The interpolated results are arrived at by applying a mathematical interpolation formula to the quinquennial graduated rates.

Merit and Longevity Pay Increase Rate. The portion of the total salary scale which varies by service. It reflects the impact of moving up the salary grid in a given year, rather than the increase in the overall grid. It includes the salary increase associated with promotions during the year.

Quinquennial Age Groupings. For the active decrements, it is preferable to group the experience in five-year age groups for graduation and analysis purposes so as to minimize statistical fluctuations resulting from a lack of exposure which may occur for individual ages. Quinquennial age grouping is the five-year age grouping which is used to develop the graduated rates of decrement for active membership. The quinquennial age is the central age of the five-year grouping.

Select and Ultimate Assumptions. Assumptions which vary by years of service in addition to sex and/or age. In a retirement system you might expect service to be a factor in the rates of withdrawal, retirement, and salary increase.

Tabular Rates. The tabular rate of decrement or salary increase is the rate determined by the graduation and interpolation process. It is the expected rate of change as opposed to the crude rate of change. It is deemed to be the underlying rate applicable to the decrement or to the rate of salary increase. In the first phase of the study, the actual results are compared to the expected results based on the tabular rates developed by the previous study. The second phase of the study determines the new tabular rates based on the crude rates. The final phase of the study compares the actual decrement to the expected decrement based on the new tabular rates.

Wage Inflation. The general rate of increase in salaries during a year. It is the component of the total salary scale which is independent of age or service. It consists of two components: inflation and productivity increases. It may be viewed as the ultimate rate of increase if there are no more step-rate/promotional increases applicable.

January 29, 2009

Mr. Walter Stampor, Executive Director
The Police and Fire Retirement System of the City of Detroit
2 Woodward Avenue, Suite 908
Detroit, Michigan 48226

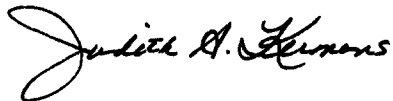
Re: 2002-2007 Experience Study

Dear Walter:

Enclosed are 20 copies of the report of the 2002-2007 Experience Study of the Police and Fire Retirement System of the City of Detroit.

Please call if you have any questions.

Sincerely,



Judith A. Kermans

MDD:sew:mrh
Enclosures