

City of Pawtucket Police and Firefighters Pension Plan



Experience Study

Lawrence B. Stone
Consulting Actuary



STONE
CONSULTING, INC.

5 West Mill Street, Suite 5
Medfield, MA 02052

t. (508) 359-9600
f. (508) 359-0190
e-mail: Lstone@stoneconsult.com

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STONE
CONSULTING, INC.

March 30, 2012

Ms. Joanna L'Heureux
Finance Director
City of Pawtucket
City Hall
137 Roosevelt Avenue
Pawtucket, RI 02860

re: Experience Study

Dear Ms. L'Heureux:

We are pleased to submit this report of our review of the actuarial experience of the City of Pawtucket's Police and Firefighters Pension Plan. Our study covered eight (8) years of census data, and seven (7) years of experience, covering the years July 1, 2004 to July 1, 2011. The scope of the study included non-economic assumptions covering retirement, withdrawal, disability, mortality, and the salary scale.

We have summarized our recommendations in the Executive Summary of our report for proposed changes to the actuarial assumptions to include in the July 1, 2011 valuation of the plan.

We are available to answer any questions you have regarding the report.

Sincerely,

Lawrence B. Stone
Member, American Academy of Actuaries



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I. EXECUTIVE SUMMARY

In order to determine costs and liabilities of the Pension Fund, assumptions are established about anticipated future events that could affect the amount and timing of benefits to be paid and the assets needed to fund these benefits. Periodically actual experience is compared against these assumptions to determine any differences. If these differences are deemed material, the assumptions made in the next valuation are adjusted to better reflect true experience as well as expected future experience. In the absence of a “crystal ball,” common sense suggests that using past experience to project future experience is the best way to “foresee” the future. This is the foundation on which an experience study is based. However, actual experience is also not foolproof, as past experience may not track well with future experience. Our goal is to make assumptions, fine-tune them over the course of time, so that we can be as accurate as possible regarding determining benefit costs and liabilities, and therefore have adequate assets to fund these benefits.

The actuarial assumptions used do not determine the “actual cost” of the plan. Actual employer cost is determined based upon the benefits and administration expenses paid out, offset by employee contributions and investment income received. The goal is to estimate as closely as possible what the actual cost will be in order to appropriately set aside contributions today to provide benefits in the future, and to fiscally manage the Fund so that it is equitable across generations of plan members and taxpayers. Making contributions to the Fund based upon the actuarial valuation is of critical importance. ***Without consistent and adequate funding***, no matter how good the measurement of the plan’s actual cost, the pension plan will be poorly funded and will not meet these equity objectives.

This study was undertaken in order to compare the actual experience during a seven year period (7/1/2004 to 7/1/2011) with that expected under the current assumptions. This study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 35, “Selection





of Demographic and Other Non-economic Assumptions for Measuring Pension Obligations.” It was performed to comply with Rhode Island General Laws Chapter 45-65 relating to required experience studies and alternative funding improvement plans. This chapter requires that an experience study be conducted, and that the results be incorporated into the Fiscal 2014 budget, if not before.

Based upon the study, we are recommending changes in the assumptions for retirement, pre-retirement mortality, healthy life mortality, disabled life mortality, disability incidence rates, and salary increases.

Our recommendations for the major actuarial assumptions are:

Salary Assumption – the pattern of increase from year to year of an *individual’s* pensionable pay. This is not the same as projecting the payroll of the entire group.

Recommendation: We recommend an assumption that varies by service.

Retirement Rates – the probability that a participant retires at a particular age.

Recommendation: We recommend changing the rates to better reflect the wide range of service of retirees. The range we recommend varies from twenty (20) years of service to thirty-nine (39) years of service. In addition, we recommend that the service of employees account for purchased service or the stated intent to purchase service.

Mortality Rates – the probability of dying at each age. Mortality rates are used to project life expectancies.

Recommendation: We recommend adjusting the rates to a published mortality table that is adjusted to “blue collar” workers. Other adjustments include the use of generational mortality.





Withdrawal Rates – the probability of leaving employment at each age and receiving either a refund of contributions or a deferred vested retirement benefit.

Recommendation: We recommend maintaining the existing assumption of zero withdrawal.

Disability Incidence Rates – the probability that a participant meets the plan definition of disability and retires under that provision at a particular age.

Recommendation: we recommend changing to a new table that reflects the much greater incidence of disability compared to the current table.

A detailed discussion of the experience and reasons for the proposed changes is found in Section III.





II. METHODOLOGY

This study addresses demographic assumptions that include the probabilities of certain events occurring in the population of members, referred to as “decrements” (i.e., withdrawal from service, disability retirement, service retirement, and death after retirement). We also reviewed the salary increase assumption.

Demographic Assumptions

To determine the probability of an event occurring, one determines the “decrements” and “exposures” of that event. For example, for retirements, we compare the number of employees who retired in a certain service category (i.e., the number of “exposures”). The number of exposures with 20 years of service was 77 over the seven-year experience period. Of the 77 exposures, 4 people retired, a rate of 5%.

The reliability of the resulting probability is highly dependent on both the number of decrements and the number of exposures. One reason we used several years of experience for the study is to have more exposures and decrements that result in greater statistical reliability. Using several years of experience also enables us to smooth fluctuations that occur from one year to the next. Even though we have used seven years of census data, the number of exposures is still low for a study of this sort. We have used the actual experience as a guide to our recommendations and not imitated every variation or discontinuity in the data in our recommended rates. Events such as past changes in post-retirement medical coverage can strongly influence past retirement experience without the likelihood of equivalent future experience.





III. ACTUARIAL ASSUMPTIONS

RETIREMENT RATES

The amount of service at which a member retires will affect both the amount of the benefits that will be paid to that member as well as the period over which funding of these benefits must take place.

For both Fire and Police members we used experience collected during the seven year period. The actual service (non-disability) retirement experience for active participants over the past seven years is provided on the following page, followed by the current and proposed retirement rates.

In prior valuations, we have assumed that all active employees retire when they reach 27 years of service. The experience study showed that there was significant retirement at the earliest eligibility for service (20 years), as well as significant retirement at the age of maximum benefit (23 1/3 years of service). In addition, twenty-five percent (25%) of retirements were at 30 years of service or more.

Based upon our findings, we have proposed a new retirement assumption as follows:





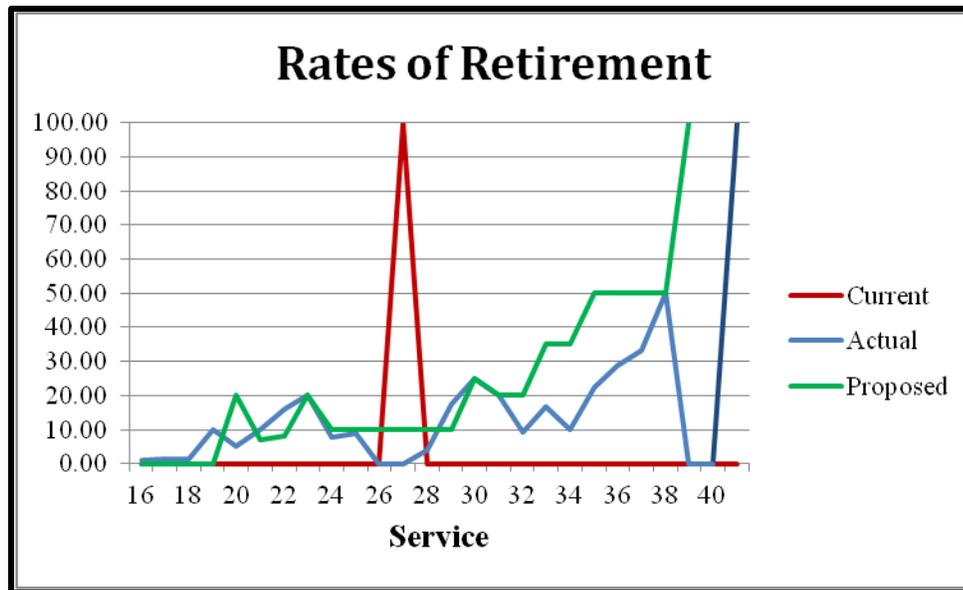
RETIREMENT RATES (Continued)

Service	Current	Actual	Proposed
16	0.00 %	1.19 %	0.00 %
17	0.00	1.33	0.00
18	0.00	1.22	0.00
19	0.00	10.11	0.00
20	0.00	5.19	20.00
21	0.00	10.13	7.00
22	0.00	16.00	8.00
23	0.00	20.00	20.00
24	0.00	7.89	10.00
25	0.00	8.82	10.00
26	0.00	0.00	10.00
27	100.00	0.00	10.00
28	0.00	4.00	10.00
29	0.00	17.65	10.00
30	0.00	25.00	25.00
31	0.00	20.00	20.00
32	0.00	9.09	20.00
33	0.00	16.67	35.00
34	0.00	10.00	35.00
35	0.00	22.22	50.00
36	0.00	28.57	50.00
37	0.00	33.33	50.00
38	0.00	50.00	50.00
39	0.00	0.00	100.00
40	0.00	0.00	100.00
41	0.00	100.00	100.00





RETIREMENT RATES (Continued)



An additional development was the prevalence of purchasing service, mostly military; therefore, we have recommended changing the data methodology to include the gathering and use of this information in our valuation methodology. As the chart shows above, there were numerous retirements prior to the twenty (20) year minimum service requirement. We believe this is related to purchased service and have treated the pre-twenty retirements as retirements with twenty years of service.

MORTALITY RATES – HEALTHY

The “healthy” mortality rates project what proportion of members will die before retirement as well as the life expectancy of a member who retires from service (i.e., who did not retire on a disability pension). The tables currently being used for post-service retirement mortality rates are the RP-2000 Healthy Annuitant Mortality Table (separate tables for males and females) with the same table being used for retirees and beneficiaries (other than by gender).



Pre-Retirement Mortality

The number of deaths among active members is not large enough to provide statistics credible enough to develop a unique table. Therefore, it is assumed that pre-retirement mortality and post-retirement mortality will follow similar tables.

Post-Retirement Mortality (Service Retirements – Males)

Among service retired members, the actual deaths compared to the expected deaths under the current and proposed assumptions for the last seven years is as follows:

**Healthy Retirees and Beneficiaries
Deaths - Male**

Age	Current	Actual	Proposed	Age	Current	Actual	Proposed
45	0.1323 %	0.0000 %	0.1686 %	68	1.5521 %	2.1739 %	1.9542 %
46	0.1403	3.5714	0.1793	69	1.7198	2.3256	2.1681
47	0.1491	0.0000	0.1894	70	1.9091	5.2632	2.3944
48	0.1583	0.0000	0.2006	71	2.1124	0.0000	2.6758
49	0.1681	0.0000	0.2128	72	2.3454	0.0000	2.9337
50	0.1783	0.0000	0.2264	73	2.6125	2.2222	3.2192
51	0.2022	0.0000	0.2412	74	2.9145	3.0303	3.5401
52	0.2179	0.0000	0.2744	75	3.2859	3.0303	3.9053
53	0.2383	0.0000	0.2995	76	3.6624	6.0606	4.3131
54	0.2611	0.0000	0.3296	77	4.1153	10.2564	4.7693
55	0.2991	0.0000	0.3643	78	4.6195	0.0000	5.2675
56	0.3502	0.0000	0.4196	79	5.1861	2.9412	5.8117
57	0.3954	3.0303	0.4967	80	5.8213	5.8824	6.4067
58	0.4488	3.2258	0.5629	81	6.5814	2.9412	7.0547
59	0.5059	0.0000	0.6398	82	7.4274	9.3750	7.8164
60	0.5742	1.4493	0.7258	83	8.2794	11.5385	8.6361
61	0.6599	1.5152	0.8270	84	9.3010	4.7619	9.5191
62	0.7529	0.0000	0.9428	85	10.3244	13.6364	10.4668
63	0.8695	1.4286	1.0773	86	11.4467	7.6923	11.5077
64	0.9797	1.6129	1.2310	87	12.8097	2.1739	12.6358
65	1.1062	0.0000	1.3811	88	14.3228	2.3256	13.8628
66	1.2642	1.9231	1.5539	89	15.8284	5.2632	15.1945
67	1.4103	1.9231	1.7554	90	17.6202	0.0000	16.6254



Post-Retirement Mortality (Service Retirements – Males) (Continued)



The above chart compares actual to expected deaths for male members under the current and proposed assumptions over the last seven years. Recent experience shows that there were more deaths than predicted by the current table.

For males, the ratio of actual to expected deaths was 117%. We recommend changing to the RP-2000 Combined Mortality Table Adjusted to Blue Collar (male tables). The ages would be set-back by one-year. This will bring the actual to expected ratio to 105%. Then to provide for future mortality improvements we recommend using generational mortality. Currently we are using scale AA as shown in the Society of Actuaries RP-2000 Mortality Table Report. The Society has just released a new interim Scale BB. We believe this may be a better choice. We will examine its usefulness in the next few weeks. A ratio of actual deaths to expected deaths of over 100% is conservative as it projects retirees to receive benefits somewhat longer. This produces a more fiscally conservative result.





Post-Retirement Mortality (Service Retirements – Females)

Actual deaths compared to the expected deaths under the current and proposed assumptions for the last seven years is as follows:

**Healthy Retirees and Beneficiaries
Deaths - Female**

Age	Current	Actual	Proposed	Age	Current	Actual	Proposed
45	0.0957 %	0.0000 %	0.1387 %	68	1.2788 %	0.0000 %	1.4716 %
46	0.1030	0.0000	0.1492	69	1.4133	0.0000	1.6387
47	0.1106	0.0000	0.1600	70	1.5923	0.0000	1.8634
48	0.1196	0.0000	0.1712	71	1.7494	0.0000	2.0734
49	0.1293	0.0000	0.1832	72	1.9458	0.0000	2.3062
50	0.1412	0.0000	0.1963	73	2.1412	0.0000	2.5566
51	0.1576	0.0000	0.2098	74	2.3731	0.0000	2.8182
52	0.1753	0.0000	0.2247	75	2.5937	0.0000	3.0888
53	0.1956	11.1111	0.2408	76	2.8576	0.0000	3.3784
54	0.2192	0.0000	0.2589	77	3.1791	6.2500	3.6902
55	0.2507	0.0000	0.2795	78	3.5045	5.8824	4.0415
56	0.2910	0.0000	0.3059	79	3.8690	0.0000	4.4370
57	0.3308	0.0000	0.3390	80	4.2767	10.5263	4.8953
58	0.3731	0.0000	0.3798	81	4.7335	0.0000	5.4233
59	0.4224	0.0000	0.4309	82	5.2475	0.0000	6.0235
60	0.4808	0.0000	0.4949	83	5.8266	12.0000	6.7006
61	0.5530	0.0000	0.5794	84	6.4801	8.6957	7.4661
62	0.6332	0.0000	0.6781	85	7.2923	8.6957	8.3100
63	0.7274	12.5000	0.7979	86	8.2153	14.2857	9.2336
64	0.8198	8.3333	0.9135	87	9.2552	5.2632	10.2406
65	0.9231	0.0000	1.0398	88	10.3087	17.6471	11.3312
66	1.0418	0.0000	1.1838	89	11.5627	11.1111	12.4754
67	1.1568	0.0000	1.3217	90	12.7784	0.0000	13.6686



Post-Retirement Mortality (Service Retirements – Females) (Continued)



The above chart compares actual to expected deaths for all female members under the current and proposed assumptions over the last seven years. For females, the ratio of actual deaths to expected deaths was 121%. The proposed table is the same as used for males, except the female table is used and has no set-back. This will bring the actual to expected ratio to 107%. Generational mortality is also recommended for the female mortality.

DISABLED MORTALITY

Due to the relatively small number of disabled retirees, it is difficult to ascertain results with any statistical significance. In addition, the inability to identify formerly disabled retirees after their benefits convert to regular retirement benefits precludes a credible study of disabled mortality. We recommend using the proposed healthy mortality tables set-forward two years.



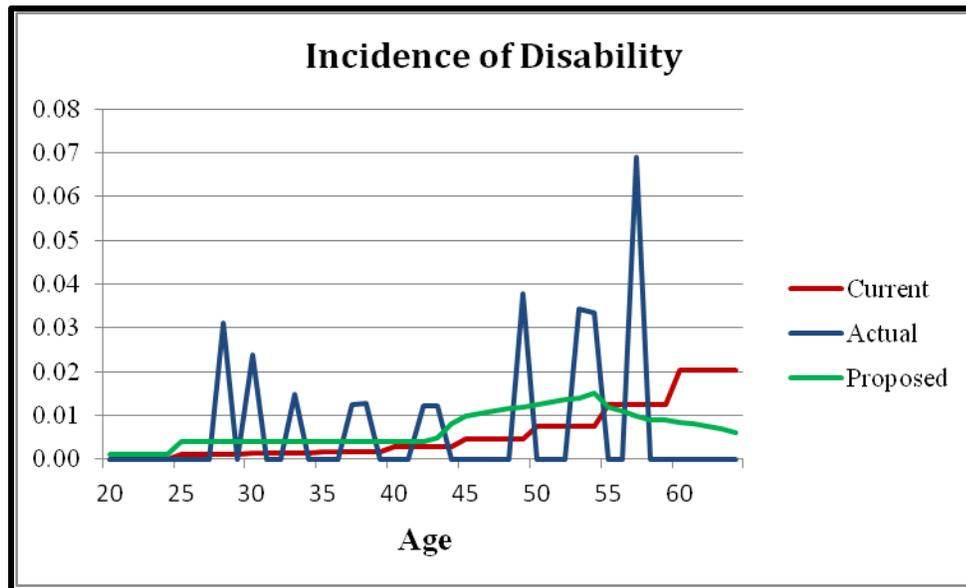
DISABILITY INCIDENCE RATES

When a member becomes disabled, s/he may be entitled to a service connected disability benefit. On the following page we have summarized the actual incidence of disabilities over the past seven years compared to the current and proposed assumptions for disability incidence:

Age	Current	Actual	Proposed	Age	Current	Actual	Proposed
20	0.00 %	0.00 %	0.10 %	43	0.28 %	0.0122 %	0.50 %
21	0.00	0.00	0.10	44	0.28	0.0000	0.80
22	0.00	0.00	0.10	45	0.45	0.0000	1.00
23	0.00	0.00	0.10	46	0.45	0.0000	1.05
24	0.00	0.00	0.10	47	0.45	0.0000	1.10
25	0.11	0.00	0.40	48	0.45	0.0000	1.15
26	0.11	0.00	0.40	49	0.45	0.0377	1.20
27	0.11	0.00	0.40	50	0.76	0.0000	1.25
28	0.11	3.13	0.40	51	0.76	0.0000	1.30
29	0.11	0.00	0.40	52	0.76	0.0000	1.35
30	0.14	2.38	0.40	53	0.76	0.0345	1.40
31	0.14	0.00	0.40	54	0.76	0.0333	1.50
32	0.14	0.00	0.40	55	1.26	0.0000	1.20
33	0.14	1.49	0.40	56	1.26	0.0000	1.10
34	0.14	0.00	0.40	57	1.26	0.0690	1.00
35	0.18	0.00	0.40	58	1.26	0.0000	0.90
36	0.18	0.00	0.40	59	1.26	0.0000	0.90
37	0.18	1.25	0.40	60	2.03	0.0000	0.85
38	0.18	1.27	0.40	61	2.03	0.0000	0.80
39	0.18	0.00	0.40	62	2.03	0.0000	0.75
40	0.28	0.00	0.40	63	2.03	0.0000	0.70
41	0.28	0.00	0.40	64	2.03	0.0000	0.60
42	0.28	1.22	0.40				



DISABILITY INCIDENCE RATES (Continued)



The current disability assumption produces a ratio of actual to expected disability of 171%. The proposed rate is based on a published table by the Massachusetts Public Employees Retirement Administration Commission's local experience study for public safety. The incidence between ages 25 to 42 years were increased to .004% to better reflect Pawtucket's past experience.

WITHDRAWAL RATES

Over the seven year period, there were three withdrawals, with two appearing to be slightly delayed retirements, we recommend maintaining the zero rate of withdrawal.

SALARY INCREASES

The two major factors in determining the level of retirement benefits are salary and length of service. The salary increase has been assumed to be 4% per year. This had been reduced from prior levels to reflect the difficult financial position of the City as well as lower overall economic inflation.





SALARY INCREASES (Continued)

The salary increase assumption is an assumption of an individual's change in salary and not of the overall increase in payroll. The intent is to project an individual's salary to their retirement. The factors that affect an individual's salary are:

- general wage increases
- longevity increases
- promotions
- miscellaneous (such as shift differential)

The current assumption of 4% melds these changes and uses a geometric average to recognize these factors over an individual's career.

This type of assumption tends to over-estimate increases for long-service employees and understates increases for shorter-service employees.

We recommend a service-related assumption that more closely follows the pattern of general increases plus longevity increases as well as increases due to promotions.

The following table and chart illustrates the current assumption, actual experience and the proposed assumption.





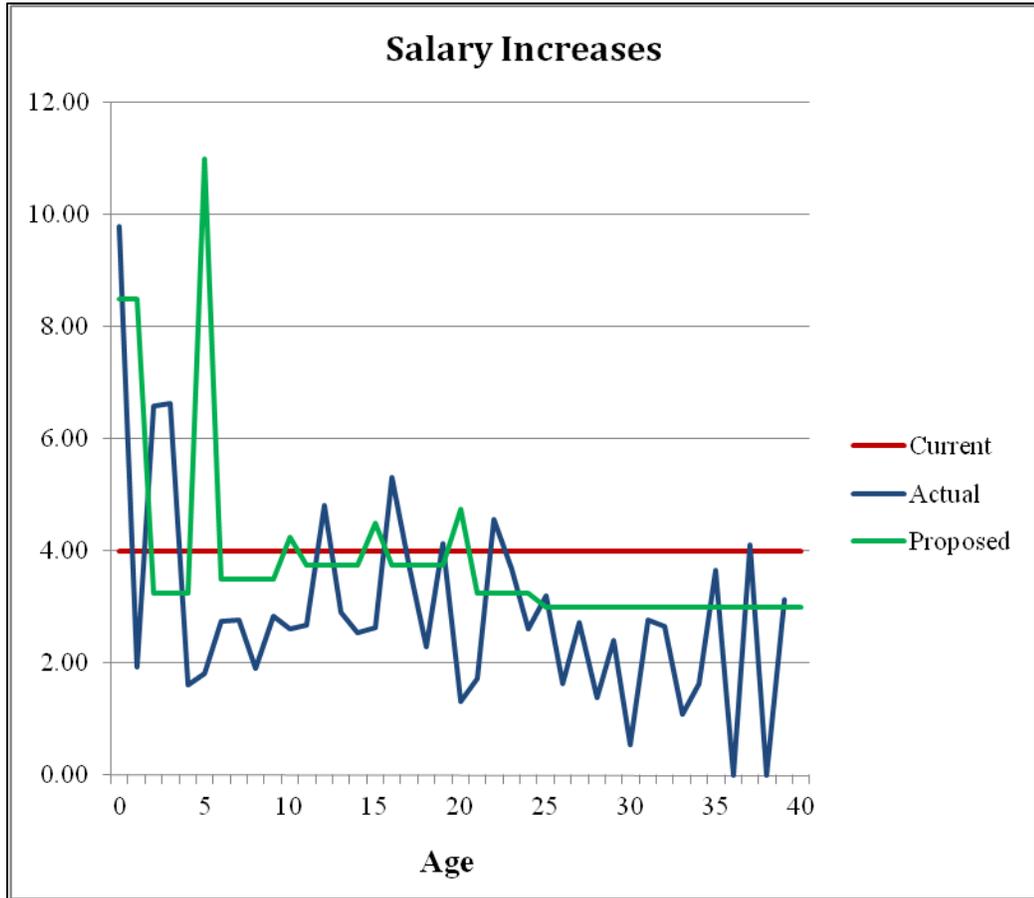
SALARY INCREASES (Continued)

Service	Current	Actual	Proposed	Service	Current	Actual	Proposed
0	4.00 %	* %	8.50 %	20	4.00 %	4.14 %	4.75 %
1	4.00	9.80	8.50	21	4.00	1.32	3.25
2	4.00	1.94	3.25	22	4.00	1.72	3.25
3	4.00	6.58	3.25	23	4.00	4.56	3.25
4	4.00	6.64	3.25	24	4.00	3.68	3.25
5	4.00	1.61	11.00	25	4.00	2.61	3.00
6	4.00	1.81	3.50	26	4.00	3.20	3.00
7	4.00	2.74	3.50	27	4.00	1.64	3.00
8	4.00	2.76	3.50	28	4.00	2.73	3.00
9	4.00	1.91	3.50	29	4.00	1.38	3.00
10	4.00	2.85	4.25	30	4.00	2.40	3.00
11	4.00	2.62	3.75	31	4.00	0.54	3.00
12	4.00	2.67	3.75	32	4.00	2.76	3.00
13	4.00	4.82	3.75	33	4.00	2.65	3.00
14	4.00	2.90	3.75	34	4.00	1.09	3.00
15	4.00	2.54	4.50	35	4.00	1.64	3.00
16	4.00	2.64	3.75	36	4.00	3.66	3.00
17	4.00	5.32	3.75	37	4.00	0.00	3.00
18	4.00	3.68	3.75	38	4.00	4.12	3.00
19	4.00	2.30	3.75	39	4.00	0.00	3.00
				40	4.00	3.14	3.00

* Partial year salary information



SALARY INCREASES (Continued)





SALARY INCREASES (Continued)

The following table is an excerpt from the most recent Police contract:

Longevity Schedule

Years of Service	Percentage
0 - 4	0%
5 - 9	7.50%
10 - 14	8.50%
15 - 19	9.75%
20 +	10.75%

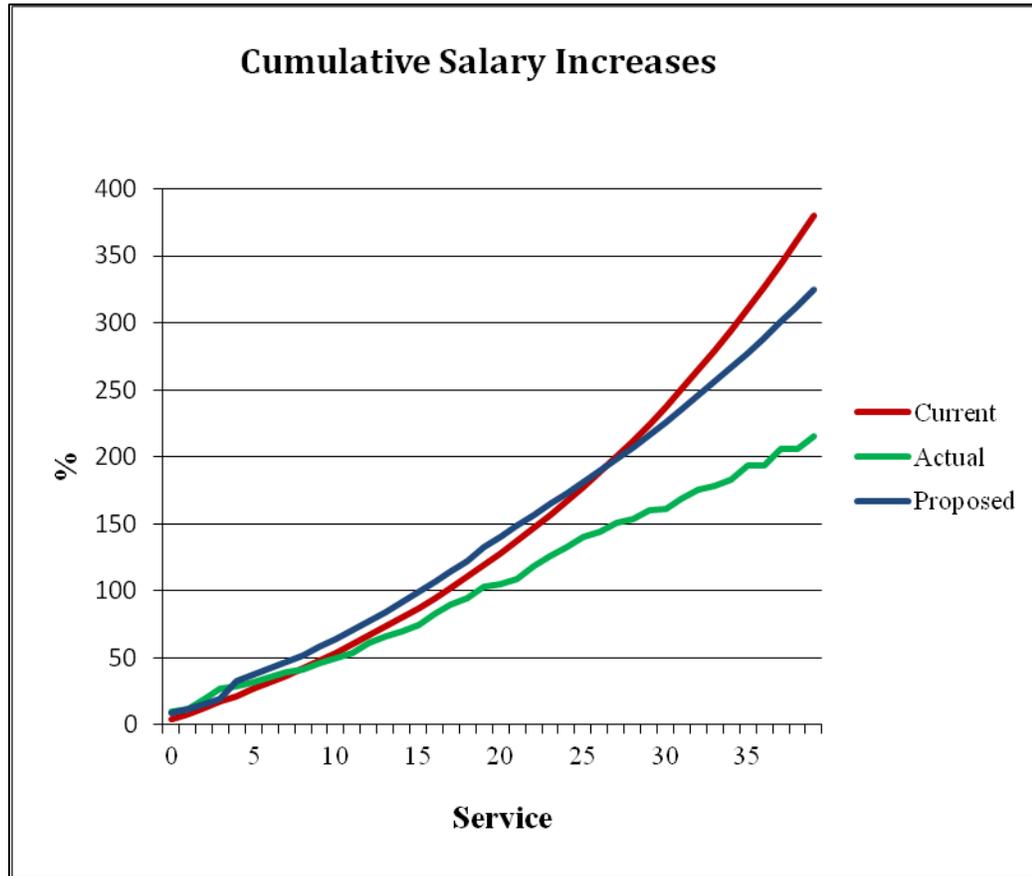
The proposed assumption reflects this provision as part of the service related increases.

The chart on the following page illustrates the cumulative effect of the current salary assumption, actual experience and proposed salary assumption on the salary of an employee.





SALARY INCREASES (Continued)





IV. ACTUARIAL ASSUMPTION SUMMARY

1. Withdrawal Prior to Retirement No withdrawal is assumed.

2. Disability Prior to Retirement

Age	Disability Assumption	
	<i>Current</i>	<i>Proposed</i>
25	.11%	.40%
30	.14	.40
35	.18	.40
40	.28	.40
45	.45	1.00
50	.76	1.25
55	1.26	1.20
60	2.03	.85

3. Rates of Retirement

Current Assumption: Retirement: is assumed to happen at the earlier of age 65 or the completion of 27 years of service.

Proposed:

Years of Service	Retirement Rate
20	20%
21	7
22	8
23	20
24	10
25	10
26	10
27	10
28	10
29	10
30	25
31	20
32	20
33	35
34	35
35	50
36	50
37	50
38	50
39 and more	100





ACTUARIAL ASSUMPTION SUMMARY (Continued)

- | | |
|----------------------------|---|
| 4. Mortality | <p><i>Current:</i> The RP-2000 combined mortality table (sex-distinct) projected 10 years with scale AA.</p> <p><i>Proposed:</i> RP-2000 combined mortality (sex-distinct) with Blue Collar adjustment. Male table set-back by one-year. Tables further adjusted by use of generational mortality based on Scale AA.</p> |
| 5. Disabled Life Mortality | <p><i>Current:</i> PBGC mortality table for disabled participants receiving Social Security Benefits.</p> <p><i>Proposed:</i> RP-2000 combined mortality (sex-distinct) with Blue Collar adjustment. Male table set-forward by one year and female table set-forward two-years. Tables further adjusted by use of generational mortality based on Scale AA.</p> |

