City of Clearwater Employees' Pension Plan

EXPERIENCE INVESTIGATION FOR THE FIVE YEARS ENDED DECEMBER 31, 2022

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September 29, 2023

Board of Trustees
City of Clearwater Employees' Pension Plan
Clearwater, Florida

Re: Experience Investigation for the Five-Year Period Ending December 31, 2022

Dear Board Members:

Gabriel, Roeder, Smith & Company is pleased to provide the results of our experience investigation for the City of Clearwater Employees' Pension Plan. The period covered by this study is January 1, 2018 through December 31, 2022. Based upon the results, certain changes in actuarial assumptions for valuation purposes are recommended.

The Table of Contents, which immediately follows, sets out the material contained in this report.

This Report was prepared at the request of the Board and is intended for use by the Pension Plan (Plan) and those designated or approved by the Board. This Report may be provided to parties other than the Plan only in its entirety and only with the permission of the Board.

The purpose of this Report is to evaluate the assumptions and methods to be used for the January 1, 2024 and subsequent years' Actuarial Valuations, and to describe the financial effect of the recommended assumption and method changes based on our findings. This Report should not be relied on for any purpose other than the purpose described above.

The study was performed on the basis of participant data and financial information supplied by the City in connection with the valuations performed during the years studied. We checked for internal and year-to-year consistency, but did not audit this data. We are not responsible for the accuracy or completeness of the information provided by the City.

The enclosed calculations are based upon the Plan provisions as summarized in the January 1, 2023 Actuarial Valuation Report dated May 15, 2023. If you have reason to believe the assumptions used are unreasonable, the Plan provisions are incorrectly described or referenced, or that important Plan provisions relevant to this study are not described, you should contact the undersigned prior to relying on this information.

The valuation date used for calculating the financial effect of the assumption and method changes was January 1, 2023. Future actuarial measurements may differ significantly from the current measurements presented in this Report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic

assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

Peter N. Strong and Trisha Amrose are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. The signing actuaries are independent of the plan sponsor.

This Report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge the information contained in this report is accurate and fairly presents the actuarial position of the Plan as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

Gabriel, Roeder, Smith & Company will be pleased to review this Report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY

By 
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By 
Trisha Amrose, MAAA, FCA
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SECTION A

SUMMARY OF FINDINGS

SUMMARY OF FINDINGS

The five-year period (January 1, 2018 to December 31, 2022) covered by this experience investigation period provided sufficient data to form a basis for recommending updates in the following demographic and financial assumptions used in the actuarial valuation of the Pension Plan.

Recommended changes in actuarial assumptions resulting from this experience investigation, including the approximate first-year impact on the required City contributions as a dollar amount and as a percent of covered payroll, the approximate first year impact on the funded ratios, and the impact on the unfunded actuarial liability (UAL), are summarized below. If these changes are made in the January 1, 2024 Actuarial Valuation Report, the impact on the FY 2025 City contributions and funded ratios as of January 1, 2024, and the impact on the UAL may vary to some extent from what is shown below.

For comparison purposes, the net required City contribution for the fiscal year ending September 30, 2024 is 13.40% of covered payroll, or $13,538,484 (broken down as $4,253,423 for non-hazardous employees, $5,128,167 for police officers, and $4,156,894 for firefighters); the funded ratio as of January 1, 2023, not including the credit balance in the actuarial value of assets, was 108.81% (110.05% for non-hazardous employees, 108.23% for police officers, and 106.58% for firefighters); and the UAL as of January 1, 2023, not including the credit balance in the actuarial value of assets, was -$98,960,255 (-$56,667,565 for non-hazardous employees, -$27,249,588 for police officers, and -$15,043,102 for firefighters). The credit balance as of January 1, 2023 was $35.6 million.

Our recommendations are as follows:

- Update the future salary increase assumption to reflect higher than expected real salary increases for all groups (more so for firefighters and non-hazardous employees than for police officers).

Group	Initial Req. City Contribution Impact	Funded Ratio Impact	UAL Impact*
Non-Haz Employees	+$1,840,457 or +3.11% of covered pay	109.21% (-0.84%)	+$4,348,370
Police Officers	+$55,545 or +0.16% of covered pay	109.07% (+0.84%)	-$2,560,271
Firefighters	+$455,293 or +2.20% of covered pay	106.61% (+0.03%)	-$74,585
Total	**+$2,351,295 or +2.26% of covered pay**	**108.64% (-0.17%)**	**+$1,713,514**

- Update assumed future retirement rates to reflect generally lower observed retirement experience than expected (although they were higher than expected at some age/service points for police officers and firefighters).

Group	Initial Req. City Contribution Impact	Funded Ratio Impact	UAL Impact*
Non-Haz Employees	-$80,864 or -0.14% of covered pay	110.52% (+0.47%)	-$2,427,196
Police Officers	-$28,011 or -0.12% of covered pay	108.13% (-0.10%)	+$314,789
Firefighters	+$16,970 or +0.09% of covered pay	106.26% (-0.32%)	+$686,882
Total	**-$91,905 or -0.09% of covered pay**	**108.94% (+0.13%)**	**-$1,425,525**

– Update assumed rates of future separation from employment to reflect lower than expected separation rates for firefighters and higher than expected separation experience for non-hazardous employees and police officers.

Group	Initial Req. City Contribution Impact	Funded Ratio Impact	UAL Impact*
Non-Haz Employees	-$466,718 or -0.80% of covered pay	109.69% (-0.36%)	+$1,835,355
Police Officers	-$111,310 or -0.48% of covered pay	108.22% (-0.01%)	+$26,591
Firefighters	+$37,247 or +0.19% of covered pay	106.71% (+0.13%)	-$279,184
Total	**-$540,781 or -0.54% of covered pay**	**108.65% (-0.16%)**	**+$1,582,762**

– Update the assumed rates of future disability to reflect lower observed disability experience than expected.

Group	Initial Req. City Contribution Impact	Funded Ratio Impact	UAL Impact*
Non-Haz Employees	-$69,071 or -0.12% of covered pay	109.96% (-0.09%)	+$440,002
Police Officers	-$35,686 or -0.15% of covered pay	108.22% (-0.01%)	+$42,846
Firefighters	-$89,962 or -0.47% of covered pay	106.46% (-0.12%)	-$246,222
Total	**-$194,719 or -0.19% of covered pay**	**108.74% (-0.07%)**	**+$729,070**

– Update the assumed probability that a member is married when they retire to reflect somewhat lower observed rates of marriage than expected and to adjust the assumed age difference between members and their spouses to reflect actual observed data for recent retirees.

Group	Initial Req. City Contribution Impact	Funded Ratio Impact	UAL Impact*
Non-Haz Employees	-$4,483 or -0.01% of covered pay	110.36% (+0.31%)	-$1,573,027
Police Officers	-$26,112 or -0.11% of covered pay	108.80% (+0.57%)	-$1,718,855
Firefighters	-$21,017 or -0.11% of covered pay	107.27% (+0.69%)	-$1,475,230
Total	**-$51,612 or -0.05% of covered pay**	**109.27% (+0.46%)**	**-$4,767,112**

– Combined effect of all of the above assumption changes (salary increase rates, retirement rates, separation rates, disability rates, and marriage rates and spouse age differences).

Group	Initial Req. City Contribution Impact	Funded Ratio Impact	UAL Impact*
Non-Haz Employees	+$1,166,633 or +1.96% of covered pay	109.41% (-0.64%)	+$3,264,895
Police Officers	-$140,994 or -0.69% of covered pay	109.51% (+1.28%)	-$3,866,860
Firefighters	+$406,764 or +1.95% of covered pay	106.97% (+0.39%)	-$842,973
Total	**+$1,432,403 or +1.36% of covered pay**	**108.95% (+0.14%)**	**-$1,444,938**

Note: The sum of the individual cost impacts does not equal the impact of all changes combined due to the interaction of Plan provisions and actuarial assumptions with one another and the effect that one assumption change can have on the impact of another assumption change.

**** The Plan is in a surplus position (it has a negative UAL - the actuarial value of assets exceeds the actuarial accrued liability) as of January 1, 2023, both before and after reflecting the proposed assumption changes. As such, the change in the UAL due to the proposed assumption changes does not impact the required City contribution (RCC), so the change in the RCC shown above is due to the change in Normal Cost only.***

SECTION B

EXPERIENCE INVESTIGATION RESULTS

Methodology

The methodology, basic results and conclusions of the five-year experience investigation of the actuarial assumptions are described below.

The expected salaries at the end of each year were obtained by use of the salary scale assumption used in the January 1, 2023 actuarial valuation. The resulting expected salaries were then compared with the actual salaries reported.

The number of members exposed to risk during each period was tabulated (exposure) and the expected incidence of separation (separation of members not eligible for normal retirement), retirement and disability were obtained by use of the retirement, separation and disability rates employed in the January 1, 2023 actuarial valuation. The actual number of retirements, separations and disabilities was tabulated and compared with those expected.

For the marriage assumption and spouse age difference assumption, actual marital status and spouse/beneficiary data was collected for retirements that have occurred during the past 5 years. This data was tabulated and reviewed.

Finally, an evaluation of the Plan's investment return assumption was conducted, using forward-looking capital market assumptions (of expected investment returns and volatilities for various asset classes) collected from 12 different investment consultants.

Consideration was given to the size of the group. Over the 5-year experience study period reviewed, there were a total of 7,700 exposures (each active member compared from one year to the subsequent year). This number of exposures is ***sufficient to provide partial credibility*** to the observed experience, but it is ***insufficient to be considered fully credible***. Therefore, we gave some credibility to both the current assumptions, which were developed based on experience during the period January 1, 2013 through January 1, 2018, and some credibility to the actual experience observed during the current study period (January 1, 2018 through January 1, 2023), while developing our recommended assumptions going forward. Giving some credibility to the experience in both the current experience study period and the study period covered by the previous experience study report is important because they cover different periods of time with varying economic landscapes, which could impact salary increases and a member's decision to separate from employment or retire.

Basic Results and Conclusions

Rates of Salary Increase

Observed rates of real salary increases (net of inflation) during the experience investigation period were generally higher than expected for all groups based on the current salary increase assumption (but more so for firefighters and non-hazardous employees than for police officers).

We propose revised assumed rates of salary increase based on completed years of service as shown in the tables below. We also propose changing the assumed rate of inflation from 2.25% to 2.40% based on current forward-looking inflation expectations. Actual versus expected salary increase experience is shown in Appendix A starting on page 23.

SALARY INCREASE ASSUMPTION - FIREFIGHTERS						
	Current Salary Increase Rates			Proposed Salary Increase Rates		
Complete Years of Service	Assumed Inflation	Promotion, Productivity & Seniority	Total Current Rates	Assumed Inflation	Promotion, Productivity & Seniority	Total Proposed Rates
Under 3	2.25%	5.35%	7.60%	2.40%	5.35%	7.75%
3 - 4	2.25%	4.00%	6.25%	2.40%	5.35%	7.75%
5 - 9	2.25%	3.25%	5.50%	2.40%	4.00%	6.40%
10 - 14	2.25%	3.00%	5.25%	2.40%	4.00%	6.40%
15 - 19	2.25%	2.25%	4.50%	2.40%	2.85%	5.25%
20 & Over	2.25%	2.25%	4.50%	2.40%	2.00%	4.40%

SALARY INCREASE ASSUMPTION - POLICE OFFICERS						
	Current Salary Increase Rates			Proposed Salary Increase Rates		
Complete Years of Service	Assumed Inflation	Promotion, Productivity & Seniority	Total Current Rates	Assumed Inflation	Promotion, Productivity & Seniority	Total Proposed Rates
Under 3	2.25%	5.35%	7.60%	2.40%	6.60%	9.00%
3 - 4	2.25%	4.00%	6.25%	2.40%	6.60%	9.00%
5 - 9	2.25%	3.25%	5.50%	2.40%	3.85%	6.25%
10 - 14	2.25%	3.00%	5.25%	2.40%	2.60%	5.00%
15 & Over	2.25%	2.25%	4.50%	2.40%	1.35%	3.75%

Rates of Salary Increase (Continued)

SALARY INCREASE ASSUMPTION - NON-HAZARDOUS EMPLOYEES						
	Current Salary Increase Rates			Proposed Salary Increase Rates		
Complete Years of Service	Assumed Inflation	Promotion, Productivity & Seniority	Total Current Rates	Assumed Inflation	Promotion, Productivity & Seniority	Total Proposed Rates
Under 2	2.25%	4.25%	6.50%	2.40%	5.60%	8.00%
2	2.25%	3.35%	5.60%	2.40%	3.60%	6.00%
3	2.25%	2.25%	4.50%	2.40%	3.60%	6.00%
4 - 9	2.25%	1.50%	3.75%	2.40%	3.60%	6.00%
10 - 14	2.25%	1.30%	3.55%	2.40%	3.35%	5.75%
15 - 19	2.25%	0.80%	3.05%	2.40%	2.60%	5.00%
20 & Over	2.25%	0.50%	2.75%	2.40%	1.10%	3.50%

Rates of Retirement

The observed number of retirements during the experience investigation period was generally lower than expected based on the current assumed rates of retirement (in the January 1, 2023 actuarial valuation), although they were higher at some age/service points for police officers and firefighters.

The current and proposed retirement rates are shown in the following tables. Actual versus expected experience is shown in Appendix B on page 26.

RETIREMENT RATES - FIREFIGHTERS			
Years of Service	**Age**	**Expected Current**	**Expected Proposed**
10 - 19	50 - 54	5%	5%
	55 - 59	15%	15%
	60 - 64	40%	40%
	65 & Over	100%	40%
20 - 24	Under 55	15%	15%
	55 - 59	30%	15%
	60 - 64	40%	40%
	65 & Over	100%	100%
25 - 29	Under 55	15%	15%
	55 - 59	30%	35%
	60 - 64	40%	40%
	65 & Over	100%	100%
30 & Over	Under 55	15%	100%
	55 - 59	30%	100%
	60 - 64	40%	100%
	65 & Over	100%	100%

Rates of Retirement (Continued)

RETIREMENT RATES - POLICE OFFICERS			
Years of Service	**Age**	**Expected Current**	**Expected Proposed**
10 - 19	50 - 54	5%	5%
	55 - 59	15%	8%
	60 - 64	40%	20%
	65 & Over	100%	100%
20 - 29	Under 50	15%	12%
	50 - 54	15%	20%
	55 - 59	30%	20%
	60 - 64	40%	40%
	65 & Over	100%	100%
30 - 34	Under 55	15%	20%
	55 - 59	30%	30%
	60 - 64	40%	100%
	65 & Over	100%	100%
35 & Over	Under 55	15%	100%
	55 - 59	30%	100%
	60 - 64	40%	100%
	65 & Over	100%	100%

Rates of Retirement (Continued)

RETIREMENT RATES - NON-HAZARDOUS EMPLOYEES			
Years of Service	**Age**	**Expected Current**	**Expected Proposed**
5 - 9	65 - 74 75 & Over	30% 100%	20% 100%
10 - 19	65 - 74 75 & Over	30% 100%	30% 100%
20 - 29	55 - 59 60 - 64 65 - 69 70 & Over	20% 20% 30% 100%	20% 15% 30% 100%
30 & Over	Under 55 55 - 59 60 - 64 65 - 69 70 & Over	45% 20% 30% 50% 100%	30% 20% 20% 50% 100%

Rates of Employment Separation

The observed rates of employment separations during the experience investigation period were lower than expected for firefighters and higher than expected for non-hazardous employees and police officers.

The current and proposed separation (withdrawal) rates are shown in the following tables. Actual versus expected experience is shown in Appendix C starting on page 28.

SEPARATION RATES FIREFIGHTERS - Males			
Years of Service	**Age**	**Current Rates**	**Proposed Rates**
Under 1	Under 30 30 & Over	8.5% 8.5%	8.0% 4.0%
1	Under 30 30 & Over	7.5% 7.5%	8.0% 4.0%
2 - 4	Under 30 30 - 39 40 & Over	4.5% 4.5% 2.5%	5.0% 3.0% 3.0%
5	Under 30 30 - 39 40 & Over	4.5% 4.5% 2.5%	5.0% 1.8% 1.8%
6 & Over	Under 30 30 - 39 40 & Over	2.0% 2.0% 1.5%	5.0% 1.8% 1.8%

SEPARATION RATES FIREFIGHTERS - Females			
Years of Service	**Age**	**Current Rates**	**Proposed Rates**
Under 1	Under 40 40 & Over	20.0% 20.0%	5.0% 2.0%
1 & Over	Under 40 40 & Over	4.0% 4.0%	5.0% 2.0%

Rates of Employment Separation (Continued)

SEPARATION RATES POLICE OFFICERS - Males			
Years of Service	**Age**	**Current Rates**	**Proposed Rates**
Under 1	Under 30 30 & Over	8.5% 8.5%	7.5% 4.0%
1	Under 30 30 & Over	7.5% 7.5%	7.5% 4.0%
2	Under 30 30 - 39 40 & Over	4.5% 4.5% 2.5%	7.5% 4.0% 4.0%
3 - 4	Under 30 30 - 39 40 & Over	4.5% 4.5% 2.5%	5.5% 3.5% 3.5%
5	Under 30 30 - 39 40 & Over	4.5% 4.5% 2.5%	3.5% 2.6% 2.6%
6 & Over	Under 30 30 - 39 40 & Over	2.0% 2.0% 1.5%	3.5% 2.6% 2.6%

SEPARATION RATES POLICE OFFICERS - Females			
Years of Service	**Age**	**Current Rates**	**Proposed Rates**
Under 1	All Ages	20.0%	14.0%
1	All Ages	4.0%	14.0%
2 - 3	All Ages	4.0%	6.0%
4 & Over	All Ages	4.0%	3.9%

Rates of Employment Separation (Continued)

SEPARATION RATES NON-HAZARDOUS EMPLOYEES - Males			
Years of Service	**Age**	**Current Rates**	**Proposed Rates**
Under 1	Under 35 35 & Over	25.0% 11.0%	20.0% 20.0%
1 - 2	All Ages	16.0%	18.0%
3 - 4	Under 40 40 & Over	11.0% 5.0%	12.0% 12.0%
5 - 9	Under 30 30 - 34 35 - 44 45 - 49 50 - 54 55 - 59 60 & Over	12.5% 5.0% 5.0% 5.0% 3.0% 3.0% 7.5%	9.0% 9.0% 6.0% 5.0% 5.0% 3.5% 3.5%
10 & Over	Under 35 35 - 39 40 - 44 45 - 49 50 - 54 55 - 59 60 & Over	7.5% 4.0% 3.5% 3.5% 2.0% 3.0% 4.5%	5.0% 3.3% 3.3% 3.1% 3.1% 3.1% 3.1%

Rates of Employment Separation (Continued)

SEPARATION RATES NON-HAZARDOUS EMPLOYEES - Females			
Years of Service	**Age**	**Current Rates**	**Proposed Rates**
Under 1	Under 30	22.0%	25.0%
	30 - 34	15.0%	25.0%
	35 - 39	5.0%	25.0%
	40 - 44	5.0%	12.5%
	45 - 49	14.0%	12.5%
	50 - 59	18.0%	12.5%
	60 & Over	25.0%	12.5%
1 - 2	Under 30	22.0%	17.0%
	30 - 34	15.0%	17.0%
	35 - 44	5.0%	17.0%
	45 - 49	14.0%	17.0%
	50 - 59	18.0%	17.0%
	60 & Over	25.0%	17.0%
3 - 4	Under 30	18.0%	12.0%
	30 - 39	14.0%	12.0%
	40 - 59	5.0%	12.0%
	60 & Over	20.0%	12.0%
5 - 9	Under 35	5.0%	9.0%
	35 - 39	6.0%	9.0%
	40 - 44	6.0%	7.0%
	45 - 54	4.5%	7.0%
	55 - 59	4.5%	4.0%
	60 & Over	3.0%	3.0%
10 & Over	Under 40	6.0%	6.0%
	40 - 44	5.0%	6.0%
	45 - 49	3.75%	3.5%
	50 - 54	3.25%	3.5%
	55 - 59	2.75%	3.0%
	60 & Over	6.0%	3.0%

Rates of Disability

The actual number of disabilities was generally lower than the number of expected disabilities (except for male police officers, where it was somewhat higher), more so for non-hazardous employees than for any other group. As a result, we recommend modest changes to the assumed rates of disability, as shown below. The proposed new disability rates for non-hazardous employees are equal to the rates currently in use for Regular Class members of the Florida Retirement System (FRS). Actual versus expected experience is shown in Appendix D on page 32.

DISABILITY RATES - FIREFIGHTERS				
	Expected Current Rates		Expected Proposed Rates	
Age	Males	Females	Males	Females
20	0.25%	0.50%	0.22%	0.22%
25	0.25%	0.50%	0.22%	0.22%
30	0.25%	0.75%	0.22%	0.22%
35	0.30%	1.00%	0.26%	0.26%
40	0.45%	1.25%	0.40%	0.40%
45	0.60%	1.50%	0.52%	0.52%
50	0.60%	1.50%	0.52%	0.52%
55	0.60%	1.50%	0.52%	0.52%
60	0.75%	1.50%	0.68%	0.68%
65	1.00%	1.50%	0.88%	0.88%
70	1.50%	1.50%	1.20%	1.20%

DISABILITY RATES - POLICE OFFICERS				
	Expected Current Rates		Expected Proposed Rates	
Age	Males	Females	Males	Females
20	0.25%	0.50%	0.30%	0.30%
25	0.25%	0.50%	0.30%	0.30%
30	0.25%	0.75%	0.30%	0.30%
35	0.30%	1.00%	0.35%	0.35%
40	0.45%	1.25%	0.52%	0.52%
45	0.60%	1.50%	0.72%	0.72%
50	0.60%	1.50%	0.72%	0.72%
55	0.60%	1.50%	0.72%	0.72%
60	0.75%	1.50%	0.87%	0.87%
65	1.00%	1.50%	1.10%	1.10%
70	1.50%	1.50%	1.50%	1.50%

Rates of Disability (Continued)

DISABILITY RATES - NON-HAZARDOUS EMPLOYEES				
	Expected Current Rates		Expected Proposed Rates	
Age	Males	Females	Males	Females
20	0.03%	0.03%	0.001%	0.001%
25	0.03%	0.03%	0.011%	0.011%
30	0.03%	0.03%	0.011%	0.011%
35	0.04%	0.04%	0.011%	0.011%
40	0.07%	0.07%	0.021%	0.021%
45	0.10%	0.10%	0.041%	0.041%
50	0.14%	0.14%	0.082%	0.082%
55	0.24%	0.24%	0.165%	0.165%
60	0.29%	0.29%	0.216%	0.216%
65	0.34%	0.34%	0.041%	0.041%
70	0.44%	0.44%	0.041%	0.041%

Rates of Marriage and Spouse Age Differences

For the purposes of determining eligibility for the Joint and Survivor normal form of payment for married members, an assumption for the probability that members are married when they retire is made. This assumption is also used to determine eligibility for death-in-service benefits. **Under the current valuation assumptions, 75% of active members are assumed to be married.**

Additionally, an assumption is made for the difference in ages between retirees and their beneficiaries. For retirees who became inactive on or after January 1, 2015, actual beneficiary genders and dates of birth are being used, so no assumption is necessary. **For members who became inactive before January 1, 2015, males are currently assumed to be 3 years older than their beneficiaries and females are assumed to be 3 years younger than their beneficiaries.**

For the 2018-2023 experience study, we analyzed data for retirements that occurred from January 1, 2018 through January 1, 2023. This analysis included 302 retirees, 166 of whom elected a joint and survivor form of payment. Lower overall rates of marriage than expected were observed. According to the data, 69.5% of members who retired during the past 5 years were married, and the marriage rate for males (76.0%) was observed to be significantly higher than it was for females (52.9%). In addition, lower than expected age differences between retirees and their beneficiaries were observed. According to the data, male retirees were observed to be an average of 1.2 years older than their beneficiaries and female retirees were observed to be an average of 0.8 years younger than their beneficiaries.

Since a small sample of the total retiree population was used in this analysis, we recommend giving some weight to the current assumptions and adjusting them to reflect the observed experience. We recommend the following assumptions for the probability that members are married when they retire and the difference in ages between retirees and their beneficiaries:

- **Assume 75% of active male members and 65% of active female members are married when they retire or separate from employment for any other reason.**
- **For members who retired or separated from employment prior to 2015, assume that male retirees are 2 years older than their beneficiaries (who are assumed to be female) and that female retirees are 2 years younger than their beneficiaries (who are assumed to be male)**. For members who retired in 2015 or later, we will continue to use the actual beneficiaries' genders and dates of birth.

Rates of Mortality

The mortality assumption used in the Plan's January 1, 2023 Actuarial Valuation is mandated under Florida state law to be the mortality assumption used by the Florida Retirement System (FRS). We are therefore not proposing any changes to the mortality assumption. FRS usually updates their mortality assumption once every five years after an experience study is completed. The last FRS experience study covered the period 2013 – 2018, and the resulting changes in assumptions were effective in the July 1, 2019 actuarial valuation. The current FRS mortality assumption (and the mortality assumption used in the January 1, 2023 Actuarial Valuation) is described below:

Healthy Mortality

Hazardous Employees (Police Officers and Firefighters)

Pre-Retirement: PUB-2010 Headcount Weighted Safety Employee Tables for Males and Females (Below Median Table for Males), with ages set forward 1 year.

Post-Retirement: PUB-2010 Headcount Weighted Safety Healthy Retiree Tables for Males and Females (Below Median Table for Males), with ages set forward 1 year.

Mortality improvements are projected to all future years after 2010 using Scale MP-2018.

Non-Hazardous Employees

Pre-Retirement: PUB-2010 Headcount Weighted General Below Median Employee Tables for Males and Females, with ages set back 1 year for males.

Post-Retirement: PUB-2010 Headcount Weighted General Below Median Healthy Retiree Tables for Males and Females, with ages set back 1 year for males.

Mortality improvements are projected to all future years after 2010 using Scale MP-2018.

Disabled Lives Mortality

Hazardous Employees (Police Officers and Firefighters)

80% of the PUB-2010 Headcount Weighted General Disabled Retiree Tables for Males and Females, and 20% of the PUB-2010 Headcount Weighted Safety Disabled Retirees Tables for Males and Females, both with no provision made for future mortality improvements.

Non-Hazardous Employees

PUB-2010 Headcount Weighted General Disabled Retiree Tables for Males and Females, with ages set forward 3 years, and with no provision made for future mortality improvements.

Rate of Investment Return

The selection of the actuarial assumed rate of return is a major decision. It has even been a controversial topic for many pension boards and outside observers at times.

HOW TO DETERMINE THE ACTUARIAL ASSUMED RATE OF RETURN

The assumed net long-term expected rate of return is the Plan fiduciaries' best estimate of the future compound investment return of the fund, net of investment-related expenses.

A building block approach should be used, in which the expected real returns (net of inflation) for each asset class in which the Plan is invested are estimated and multiplied by the asset allocation percentage of that asset class.

City of Clearwater Employees' Pension Plan Asset Allocation

The Plan's target asset allocation is as follows:

Asset Class	Target
Domestic Equity Securities	
Large Cap	29.0%
Mid Cap	9.0%
Small Cap	5.5%
International Equity (EAFE) Securities	12.0%
Emerging Market Equity Securities	1.5%
Total Equity	**57.0%**
Core Fixed Income	28.0%
Total Fixed Income	**28.0%**
Private Real Estate (Core and Core Plus)	6.2%
U.S. REITS	1.5%
Alternative Assets – Infrastructure	6.0%
Alternative Assets – Timber	1.3%
Total Real Estate & Alternatives	**15.0%**

FORWARD-LOOKING CAPITAL MARKET ASSUMPTIONS

Best practice for selecting the net investment return assumption considers a fund's asset allocation and reliable forecasts for capital market assumptions for each relevant asset class.

GRS is not an investment consulting firm and does not provide investment consulting or forecasting services. But GRS maintains a survey of the forecasts of capital market assumptions from the following twelve (12) major national investment consulting and forecasting firms to obtain a consensus:

Twelve Major National Investment Consultants and Forecasters	
Aon/Hewitt	Meketa
Blackrock	Mercer
BNY/Mellon	NEPC
Callan	R. V. Kuhns & Associates
Cambridge	Verus
J.P. Morgan	Wilshire

Of these 12 investment consultants, 5 (BNY/Mellon, Callan, J.P. Morgan, Verus, and Wilshire) provided only short to mid-term capital market assumptions (over the next 10 years), 6 (Aon/ Hewitt, Blackrock, Cambridge, Meketa, Mercer, and NEPC) provided both short to mid-term and long-term capital market assumptions (over the next 20-30 years). One investment consultant (RVK) provided only long-term assumptions. We have included both the short to mid-term forecasts and the long-term forecasts.

Mapping the Asset Allocation

The investment consultants do not all provide their capital market assumptions in exactly the same asset classes as expressed on the previous page, so we have mapped the Plan's target asset allocation to the "best fit" asset classes of each investment consultant.

Build-up of Comparable Net Expected Returns

The following tables show the results of applying the mapping and calculation process of the nominal returns for each of the investment consultants. The expected nominal returns are called the "arithmetic means". The first table shows the results of the short to mid-term capital market assumptions. The second table shows the results of the long-term capital market assumptions (from the 7 investment consultants who provided long-term assumptions).

Short to Mid-Term Capital Market Assumptions

Capital Market Assumption Set (CMA)	CMA Expected Nominal Return	CMA Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Investment Expenses (Net of Assumed Alpha)	Expected Nominal Return Net of Expenses (6)-(7)	Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	6.22%	2.50%	3.72%	2.40%	6.12%	0.00%	6.12%	11.11%
2	6.97%	2.90%	4.07%	2.40%	6.47%	0.00%	6.47%	12.27%
3	7.13%	2.50%	4.63%	2.40%	7.03%	0.00%	7.03%	11.90%
4	7.55%	2.90%	4.65%	2.40%	7.05%	0.00%	7.05%	11.74%
5	7.07%	2.31%	4.76%	2.40%	7.16%	0.00%	7.16%	12.25%
6	7.27%	2.51%	4.75%	2.40%	7.15%	0.00%	7.15%	11.91%
7	7.05%	2.26%	4.79%	2.40%	7.19%	0.00%	7.19%	11.43%
8	7.35%	2.41%	4.94%	2.40%	7.34%	0.00%	7.34%	11.47%
9	7.52%	2.28%	5.25%	2.40%	7.65%	0.00%	7.65%	11.53%
10	7.86%	2.62%	5.24%	2.40%	7.64%	0.00%	7.64%	10.58%
11	8.00%	2.54%	5.46%	2.40%	7.86%	0.00%	7.86%	11.63%
Average	**7.27%**	**2.52%**	**4.75%**	**2.40%**	**7.15%**	**0.00%**	**7.15%**	**11.62%**

Long-Term Capital Market Assumptions

Capital Market Assumption Set (CMA)	CMA Expected Nominal Return	CMA Inflation Assumption	Expected Real Return (2)–(3)	Actuary Inflation Assumption	Expected Nominal Return (4)+(5)	Investment Expenses (Net of Assumed Alpha)	Expected Nominal Return Net of Expenses (6)-(7)	Standard Deviation of Expected Return (1-Year)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	6.33%	2.50%	3.83%	2.40%	6.23%	0.00%	6.23%	10.71%
2	7.12%	2.60%	4.52%	2.40%	6.92%	0.00%	6.92%	11.11%
3	7.52%	2.90%	4.62%	2.40%	7.02%	0.00%	7.02%	11.74%
4	7.15%	2.27%	4.88%	2.40%	7.28%	0.00%	7.28%	12.25%
5	7.59%	2.67%	4.92%	2.40%	7.32%	0.00%	7.32%	11.53%
6	7.58%	2.31%	5.27%	2.40%	7.67%	0.00%	7.67%	11.76%
7	8.67%	2.64%	6.03%	2.40%	8.43%	0.00%	8.43%	11.63%
Average	**7.42%**	**2.56%**	**4.87%**	**2.40%**	**7.27%**	**0.00%**	**7.27%**	**11.53%**

Normalizing for Inflation

Since each investment consultant uses slightly different inflation assumptions, in columns (3) through (6) the returns are normalized for inflation so that each investment consultant's gross 1-year return includes the same inflation assumption. **This normalization reflects a proposed change in the Plan's inflation assumption from 2.25% to 2.40%.**

Returns Net of Investment-related Expenses

Investment consultants and forecasters generally provide their expected returns gross of active management investment-related expenses. However, for funding and financial reporting purposes, the actuarial return assumption is net of investment-related expenses, so that the investment earnings assumed to accumulate over time are net of the fees and costs needed to generate the amounts available to pay benefits. The investment-related expenses for the Plan's fund are approximately 0.55%, including asset custody fees, investment consultant fees, hard dollar investment management fee from individually-managed portfolios and other investment fees.

The Actuarial Standards of Practice suggests the use of an assumption that is net of the expenses that would be required for an equivalent passive investment approach. Added value from active management can be recognized in excess of that, but not for more than the difference between active and passive management fees. While excess "alpha" returns may be expected by some to be achieved by the Plans' current and future investment managers and investment consultant, we cannot add alpha value in our assessment or development of our recommendation for the net investment return assumption. We have assumed excess returns will be generated by active management that are sufficient to cover the investment expenses incurred, and we have assumed that the fees that would be involved with a passive management approach are reflected in the expected returns provided.

Column (8) shows the expected nominal (i.e., including inflation) return for any given 1-year period, net of investment-related expenses. These are called the expected "arithmetic means".

Arithmetic and Geometric Returns

Arithmetic expected returns represent the investment forecaster's expectation for any one given year. Geometric expected returns represent the investment forecaster's expectation for the average compound return over a given horizon period. Everything in the tables on the previous page relates to arithmetic means.

Geometric compounded average returns are always lower than arithmetic average returns. Actuarial valuations use compounding for measuring costs and liabilities. That is why the expected compound average return (geometric mean) is more appropriate for an actuarial investment return assumption.

As an investment return assumption, the geometric expected return is the return assumption that has a 50% chance of being achieved as a compound average over time. The geometric expected returns for the investment consultants who provided capital market assumptions are shown in the following tables. The first table shows the geometric expected returns using the short to mid-term capital market assumptions. The second table shows the geometric expected returns using the long-term capital market assumptions (from the 7 investment consultants who provided long-term assumptions).

Short to Mid-Term Capital Market Assumptions

Capital Market Assumption Set (CMA)	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding
	40th	50th	60th	6.50%
(1)	(2)	(3)	(4)	(5)
1	4.92%	5.54%	6.16%	34.89%
2	5.09%	5.77%	6.46%	39.48%
3	5.71%	6.37%	7.04%	48.05%
4	5.75%	6.41%	7.07%	48.65%
5	5.78%	6.46%	7.15%	49.47%
6	5.83%	6.50%	7.17%	49.96%
7	5.95%	6.59%	7.23%	51.36%
8	6.09%	6.73%	7.38%	53.64%
9	6.39%	7.04%	7.69%	58.32%
10	6.53%	7.13%	7.72%	60.56%
11	6.59%	7.24%	7.90%	61.35%
Average	**5.87%**	**6.53%**	**7.18%**	**50.52%**

Long-Term Capital Market Assumptions

Capital Market Assumption Set (CMA)	Distribution of 20-Year Average Geometric Net Nominal Return			Probability of exceeding
	40th	50th	60th	6.50%
(1)	(2)	(3)	(4)	(5)
1	5.09%	5.69%	6.30%	36.76%
2	5.73%	6.35%	6.98%	47.60%
3	5.72%	6.38%	7.04%	48.15%
4	5.90%	6.58%	7.27%	51.24%
5	6.06%	6.71%	7.36%	53.25%
6	6.37%	7.03%	7.70%	58.13%
7	7.16%	7.81%	8.46%	69.54%
Average	**6.01%**	**6.65%**	**7.30%**	**52.10%**

As shown in the first table, the average short to mid-term expected geometric return (or the 50th percentile of long-term compound average returns) is 6.53%. The short to mid-term forecasting period is generally the next 10 years, so this means there is a 50-50 chance of achieving a 6.53% net compound average investment return over the next 10 years. Among the 7 investment consultants who provided long-term capital market assumptions, the average long-term expected geometric return is 6.65%. This means the consensus opinion is that there is a 50-50 chance of achieving a 6.65% net compound average investment return over the next 20 to 30 years.

Recommendation

Based on the information provided above, including the short-term and long-term capital market assumptions, **our recommendation is to leave the investment return assumption unchanged at 6.50%**. This is very close to both the forward-looking 10-year compound average expected return (the 50th percentile) of 6.53% and the long-term compound average expected return of 6.65%.

It should be noted that forward-looking capital market assumptions have varied significantly over the last few years. When the last experience study was prepared for this Plan (in 2018), the forward-looking 10-year compound average expected return was 5.79%, and the long-term compound average expected return was 6.44%. Now, 5 years later, the 10-year compound average expected return is 6.53% and the long-term expectation is at 6.65% (so the long-term forecast has only increased by 21 basis points while the difference between the two has narrowed significantly). Because of the volatility in the capital market forecasts, we recommend against over-reliance on this year's projections and a somewhat conservative approach with regard to setting the investment return assumption (which is why our recommendation is to maintain the status quo at 6.50% despite the current slightly higher forward-looking estimates).

SECTION C

APPENDICES

APPENDIX A

COMPARISON OF ACTUAL AND EXPECTED ANNUAL MEMBER SALARIES

ANNUAL SALARY INCREASES - FIREFIGHTERS By Years of Service									
Completed Years of Service	Prior Year	Current Assumption			Actual Experience				
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr	Proposed Real Incr
Under 5	$21,390,682	$22,935,839	7.22%	4.97%	$23,489,023	9.81%	4.08%	5.73%	**5.35%**
5 - 9	7,714,556	8,138,858	5.50%	3.25%	8,373,933	8.55%	4.08%	4.47%	**4.00%**
10 - 14	21,621,725	22,756,869	5.25%	3.00%	23,478,101	8.59%	4.08%	4.51%	**4.00%**
15 - 19	17,077,439	17,845,926	4.50%	2.25%	18,356,947	7.49%	4.08%	3.41%	**2.85%**
20 & Over	9,108,009	9,517,870	4.50%	2.25%	9,646,808	5.92%	4.08%	1.84%	**2.00%**
Total	**76,912,411**	**81,195,362**	**5.57%**	**3.32%**	**83,344,812**	**8.36%**	**4.08%**	**4.28%**	**3.88%**

ANNUAL SALARY INCREASES - FIREFIGHTERS By Years of Service								
Completed Years of Service	Prior Year	Current Assumption			Actual Experience			
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr
Under 3	$15,424,799	$16,597,087	7.60%	5.35%	$17,170,836	11.32%	4.08%	7.24%
3 - 4	5,965,883	6,338,752	6.25%	4.00%	6,318,187	5.91%	4.08%	1.83%
5 - 9	7,714,556	8,138,858	5.50%	3.25%	8,373,933	8.55%	4.08%	4.47%
10 - 14	21,621,725	22,756,869	5.25%	3.00%	23,478,101	8.59%	4.08%	4.51%
15 & Over	26,185,448	27,363,796	4.50%	2.25%	28,003,755	6.94%	4.08%	2.86%
Total	**76,912,411**	**81,195,362**	**5.57%**	**3.32%**	**83,344,812**	**8.36%**	**4.08%**	**4.28%**

ANNUAL SALARY INCREASES - FIREFIGHTERS By Attained Age (For Informational Purposes only)								
Age	Prior Year	Current Assumption			Actual Experience			
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr
Under 30	$8,622,299	$9,248,699	7.26%	5.01%	$9,750,756	13.09%	4.08%	9.01%
30 - 34	13,394,942	14,247,943	6.37%	4.12%	14,489,984	8.18%	4.08%	4.10%
35 - 39	11,982,679	12,650,580	5.57%	3.32%	13,046,554	8.88%	4.08%	4.80%
40 - 44	12,517,694	13,140,709	4.98%	2.73%	13,734,034	9.72%	4.08%	5.64%
45 - 49	12,868,748	13,497,315	4.88%	2.63%	13,866,077	7.75%	4.08%	3.67%
50 & Over	17,526,049	18,410,116	5.04%	2.79%	18,457,407	5.31%	4.08%	1.23%
Total	**76,912,411**	**81,195,362**	**5.57%**	**3.32%**	**83,344,812**	**8.36%**	**4.08%**	**4.28%**

APPENDIX A (Continued)

ANNUAL SALARY INCREASES - POLICE OFFICERS By Years of Service									
Completed Years of Service	Prior Year	Current Assumption			Actual Experience				
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr	Proposed Real Incr
Under 5	$26,508,926	$28,408,977	7.17%	4.92%	$29,673,997	11.94%	4.08%	7.86%	**6.60%**
5 - 9	14,156,578	14,935,192	5.50%	3.25%	15,325,762	8.26%	4.08%	4.18%	**3.85%**
10 - 14	19,232,058	20,241,744	5.25%	3.00%	20,450,335	6.33%	4.08%	2.25%	**2.60%**
15 & Over	33,946,435	35,474,028	4.50%	2.25%	35,662,944	5.06%	4.08%	0.98%	**1.35%**
Total	**93,843,997**	**99,059,941**	**5.56%**	**3.31%**	**101,113,038**	**7.75%**	**4.08%**	**3.67%**	**3.47%**

ANNUAL SALARY INCREASES - POLICE OFFICERS By Years of Service								
Completed Years of Service	Prior Year	Current Assumption			Actual Experience			
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr
Under 3	$18,017,511	$19,386,847	7.60%	5.35%	$20,443,609	13.47%	4.08%	9.39%
3 - 4	8,491,415	9,022,130	6.25%	4.00%	9,230,388	8.70%	4.08%	4.62%
5 - 9	14,156,578	14,935,192	5.50%	3.25%	15,325,762	8.26%	4.08%	4.18%
10 - 14	19,232,058	20,241,744	5.25%	3.00%	20,450,335	6.33%	4.08%	2.25%
15 & Over	33,946,435	35,474,028	4.50%	2.25%	35,662,944	5.06%	4.08%	0.98%
Total	**93,843,997**	**99,059,941**	**5.56%**	**3.31%**	**101,113,038**	**7.75%**	**4.08%**	**3.67%**

ANNUAL SALARY INCREASES - POLICE OFFICERS By Attained Age (For Informational Purposes only)								
Age	Prior Year	Current Assumption			Actual Experience			
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr
Under 30	$15,572,004	$16,672,861	7.07%	4.82%	$17,486,075	12.29%	4.08%	8.21%
30 - 34	12,356,201	13,121,585	6.19%	3.94%	13,501,479	9.27%	4.08%	5.19%
35 - 39	13,570,512	14,346,096	5.72%	3.47%	14,693,428	8.27%	4.08%	4.19%
40 - 44	18,597,961	19,540,621	5.07%	2.82%	19,769,372	6.30%	4.08%	2.22%
45 - 49	21,998,286	23,071,832	4.88%	2.63%	23,294,383	5.89%	4.08%	1.81%
50 & Over	11,749,033	12,306,946	4.75%	2.50%	12,368,301	5.27%	4.08%	1.19%
Total	**93,843,997**	**99,059,941**	**5.56%**	**3.31%**	**101,113,038**	**7.75%**	**4.08%**	**3.67%**

APPENDIX A (Continued)

ANNUAL SALARY INCREASES - NON-HAZARDOUS EMPLOYEES By Years of Service									
Completed Years of Service	Prior Year	Current Assumption			Actual Experience				
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr	Proposed Real Incr
Under 2	$46,382,276	$49,397,134	6.50%	4.25%	$51,530,836	11.10%	4.08%	7.02%	**5.60%**
2 - 9	65,657,141	68,425,816	4.22%	1.97%	71,493,840	8.89%	4.08%	4.81%	**3.60%**
10 - 14	38,410,294	39,773,862	3.55%	1.30%	41,741,393	8.67%	4.08%	4.59%	**3.35%**
15 - 19	34,506,033	35,558,468	3.05%	0.80%	37,212,601	7.84%	4.08%	3.76%	**2.60%**
20 & Over	40,557,612	41,672,947	2.75%	0.50%	42,868,069	5.70%	4.08%	1.62%	**1.10%**
Total	**225,513,356**	**234,828,227**	**4.13%**	**1.88%**	**244,846,739**	**8.57%**	**4.08%**	**4.49%**	**3.37%**

ANNUAL SALARY INCREASES - NON-HAZARDOUS EMPLOYEES By Years of Service								
Completed Years of Service	Prior Year	Current Assumption			Actual Experience			
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr
Under 2	$46,382,276	$49,397,134	6.50%	4.25%	$51,530,836	11.10%	4.08%	7.02%
2	12,450,374	13,147,597	5.60%	3.35%	13,641,117	9.56%	4.08%	5.48%
3	10,159,165	10,616,329	4.50%	2.25%	11,094,025	9.20%	4.08%	5.12%
4 - 9	43,047,602	44,661,890	3.75%	1.50%	46,758,698	8.62%	4.08%	4.54%
10 - 14	38,410,294	39,773,862	3.55%	1.30%	41,741,393	8.67%	4.08%	4.59%
15 - 19	34,506,033	35,558,468	3.05%	0.80%	37,212,601	7.84%	4.08%	3.76%
20 & Over	40,557,612	41,672,947	2.75%	0.50%	42,868,069	5.70%	4.08%	1.62%
Total	**225,513,356**	**234,828,227**	**4.13%**	**1.88%**	**244,846,739**	**8.57%**	**4.08%**	**4.49%**

ANNUAL SALARY INCREASES - NON-HAZARDOUS EMPLOYEES By Attained Age (For Informational Purposes only)								
Age	Prior Year	Current Assumption			Actual Experience			
		Expected	% Incr	Assumed Real Incr	Actual	% Incr	Actual Inflation	Actual Real Incr
Under 30	$23,897,410	$25,272,629	5.75%	3.50%	$26,620,712	11.40%	4.08%	7.32%
30 - 34	22,457,222	23,546,392	4.85%	2.60%	24,776,920	10.33%	4.08%	6.25%
35 - 39	23,947,760	25,012,038	4.44%	2.19%	26,207,136	9.43%	4.08%	5.35%
40 - 44	25,717,532	26,797,336	4.20%	1.95%	28,041,197	9.04%	4.08%	4.96%
45 - 49	32,801,977	34,090,272	3.93%	1.68%	35,488,304	8.19%	4.08%	4.11%
50 - 54	32,365,214	33,522,277	3.58%	1.33%	34,804,382	7.54%	4.08%	3.46%
55 - 59	34,984,426	36,271,137	3.68%	1.43%	37,553,708	7.34%	4.08%	3.26%
60 & Over	29,341,815	30,316,146	3.32%	1.07%	31,354,380	6.86%	4.08%	2.78%
Total	**225,513,356**	**234,828,227**	**4.13%**	**1.88%**	**244,846,739**	**8.57%**	**4.08%**	**4.49%**

APPENDIX B

COMPARISON OF ACTUAL AND EXPECTED RETIREMENTS

RETIREMENT EXPERIENCE - FIREFIGHTERS								
Years of Service	Age	Exposure	Current Assumed Rates	Expected Ret.'s	Actual Ret.'s	Actual Rates	Proposed Retirement Rates	Expected Retirements (New Rates)
10 - 19	50 - 54	73	5%	3.7	4	5.5%	**5%**	**3.7**
	55 - 59	20	15%	3.0	3	15.0%	**15%**	**3.0**
	60 - 64	8	40%	3.2	3	37.5%	**40%**	**3.2**
	65 & Over	5	100%	5.0	0	0.0%	**40%**	**2.0**
20 - 24	Under 55	103	15%	15.5	13	12.6%	**15%**	**15.5**
	55 - 59	11	30%	3.3	1	9.1%	**15%**	**1.7**
	60 - 64	0	40%	0.0	0	N/A	**40%**	**0.0**
	65 & Over	0	100%	0.0	0	N/A	**100%**	**0.0**
25 - 29	Under 55	26	15%	3.9	3	11.5%	**15%**	**3.9**
	55 - 59	18	30%	5.4	7	38.9%	**35%**	**6.3**
	60 - 64	4	40%	1.6	0	0.0%	**40%**	**1.6**
	65 & Over	0	100%	0.0	0	N/A	**100%**	**0.0**
30 +	All	3	25%	0.8	2	66.7%	**100%**	**3.0**
Total		**271**	**16.8%**	**45.4**	**36**	**13.3%**	**16.1%**	**43.9**

RETIREMENT EXPERIENCE - POLICE OFFICERS								
Years of Service	Age	Exposure	Current Assumed Rates	Expected Ret.'s	Actual Ret.'s	Actual Rates	Proposed Retirement Rates	Expected Retirements (New Rates)
10 - 19	50 - 54	50	5%	2.5	3	6.0%	**5%**	**2.5**
	55 - 59	15	15%	2.3	0	0.0%	**8%**	**1.2**
	60 - 64	1	40%	0.4	0	0.0%	**20%**	**0.2**
	65 & Over	0	100%	0.0	0	N/A	**100%**	**0.0**
20 - 29	Under 50	132	15%	19.8	15	11.4%	**12%**	**15.8**
	50 - 59	93	16%	15.1	19	20.4%	**20%**	**18.6**
	60 - 64	2	40%	0.8	1	50.0%	**40%**	**0.8**
	65 & Over	0	100%	0.0	0	N/A	**100%**	**0.0**
30 - 34	Under 55	8	15%	1.2	2	25.0%	**20%**	**1.6**
	55 - 59	6	30%	1.8	2	33.3%	**30%**	**1.8**
	60 & Over	1	40%	0.4	1	100.0%	**100%**	**1.0**
35 +	All	1	30%	0.3	1	100.0%	**100%**	**1.0**
Total		**309**	**14.4%**	**44.6**	**44**	**14.2%**	**14.4%**	**44.5**

APPENDIX B (Continued)

RETIREMENT EXPERIENCE - NON-HAZARDOUS EMPLOYEES								
Years of Service	**Age**	**Exposure**	**Current Assumed Rates**	**Expected Ret.'s**	**Actual Ret.'s**	**Actual Rates**	**Proposed Retirement Rates**	**Expected Retirements (New Rates)**
5 - 9	65 - 74	12	30%	3.6	2	16.7%	**20%**	**2.4**
	75 & Over	3	100%	3.0	1	33.3%	**100%**	**3.0**
10 - 19	65 - 74	119	30%	35.7	38	31.9%	**30%**	**35.7**
	75 & Over	4	100%	4.0	1	25.0%	**100%**	**4.0**
20 - 29	55 - 59	199	20%	39.8	35	17.6%	**20%**	**39.8**
	60 - 64	208	20%	41.6	23	11.1%	**15%**	**31.2**
	65 - 69	90	30%	27.0	26	28.9%	**30%**	**27.0**
	70 & Over	5	100%	5.0	3	60.0%	**100%**	**5.0**
30 +	Under 55	25	45%	11.3	5	20.0%	**30%**	**7.5**
	55 - 59	49	20%	9.8	8	16.3%	**20%**	**9.8**
	60 - 64	47	30%	14.1	7	14.9%	**20%**	**9.4**
	65 - 69	27	50%	13.5	14	51.9%	**50%**	**13.5**
	70 & Over	7	100%	7.0	2	28.6%	**100%**	**7.0**
Total		**795**	**27.1%**	**215.4**	**165**	**20.8%**	**23.4%**	**195.3**

APPENDIX C

COMPARISON OF ACTUAL AND EXPECTED SEPARATIONS

SEPARATION / WITHDRAWAL (W/D) EXPERIENCE - FIREFIGHTERS (Males)								
Years of Service	**Age**	**Exposures**	**Expected W/D's**	**Expected %**	**Actual W/D's**	**Actual %**	**Proposed %**	**Expected W/D's (Proposed Rates)**
Under 2	Under 30	49	3.83	7.8%	4	8.2%	8.0%	**3.92**
	30 & Over	45	3.51	7.8%	1	2.2%	4.0%	**1.80**
2 - 4	Under 30	37	1.66	4.5%	2	5.4%	5.0%	**1.85**
	30 & Over	112	4.61	4.1%	3	2.7%	3.0%	**3.36**
5 & Over	Under 30	8	0.29	3.6%	1	12.5%	5.0%	**0.40**
	30 & Over	399	7.68	1.9%	7	1.75%	1.8%	**7.18**
Total		**650**	**21.58**	**3.3%**	**18**	**2.8%**	**2.8%**	**18.51**

SEPARATION / WITHDRAWAL (W/D) EXPERIENCE - FIREFIGHTERS (Females)								
Years of Service	**Age**	**Exposures**	**Expected W/D's**	**Expected %**	**Actual W/D's**	**Actual %**	**Proposed %**	**Expected W/D's (Proposed Rates)**
Any	Under 40	38	1.84	4.84%	2	5.26%	5.0%	**1.90**
	40 & Over	5	0.20	4.00%	0	0.00%	2.0%	**0.10**
Total		**43**	**2.04**	**4.7%**	**2**	**4.7%**	**4.7%**	**2.00**

APPENDIX C (Continued)

SEPARATION / WITHDRAWAL (W/D) EXPERIENCE - POLICE OFFICERS (Males)								
Years of Service	**Age**	**Exposures**	**Expected W/D's**	**Expected %**	**Actual W/D's**	**Actual %**	**Proposed %**	**Expected W/D's (Proposed Rates)**
Under 3	Under 30	88	5.86	6.7%	7	8.0%	7.5%	**6.60**
	30 & Over	67	4.30	6.4%	2	3.0%	4.0%	**2.68**
3 - 4	Under 30	58	2.61	4.5%	4	6.9%	5.5%	**3.19**
	30 & Over	68	2.72	4.0%	2	2.9%	3.5%	**2.38**
5 & Over	Under 30	29	1.08	3.7%	1	3.4%	3.5%	**1.02**
	30 & Over	405	7.52	1.9%	13	3.2%	2.6%	**10.53**
Total		**715**	**24.09**	**3.4%**	**29**	**4.1%**	**3.7%**	**26.40**

SEPARATION / WITHDRAWAL (W/D) EXPERIENCE - POLICE OFFICERS (Females)								
Years of Service	**Age**	**Exposures**	**Expected W/D's**	**Expected %**	**Actual W/D's**	**Actual %**	**Proposed %**	**Expected W/D's (Proposed Rates)**
Under 2	All Ages	23	2.52	11.0%	4	17.4%	14.0%	**3.22**
2 - 3	All Ages	25	1.00	4.0%	2	8.0%	6.0%	**1.50**
4 & Over	All Ages	106	4.24	4.0%	4	3.8%	3.9%	**4.13**
Total		**154**	**7.76**	**5.0%**	**10**	**6.5%**	**5.7%**	**8.85**

APPENDIX C (Continued)

SEPARATION / WITHDRAWAL (W/D) EXPERIENCE - NON-HAZARDOUS EMPLOYEES (Males)								
Years of Service	**Age**	**Exposures**	**Expected W/D's**	**Expected %**	**Actual W/D's**	**Actual %**	**Proposed %**	**Expected W/D's (Proposed Rates)**
Under 1	All Ages	239	41.83	17.5%	58	24.3%	20.0%	**47.80**
1 - 2	All Ages	684	109.44	16.0%	149	21.8%	18.0%	**123.12**
3 - 4	All Ages	463	38.87	8.4%	75	16.2%	12.0%	**55.56**
5 - 9	Under 35	213	15.98	7.5%	24	11.3%	9.0%	**19.17**
	35 - 44	178	8.90	5.0%	13	7.3%	6.0%	**10.68**
	45 - 54	163	6.91	4.2%	10	6.1%	5.0%	**8.15**
	55 & Over	120	5.58	4.7%	3	2.5%	3.5%	**4.20**
10 & Over	Under 35	49	3.68	7.5%	2	4.1%	5.0%	**2.45**
	35 - 44	347	12.97	3.7%	10	2.9%	3.3%	**11.45**
	45 & Over	806	24.81	3.1%	26	3.2%	3.1%	**24.99**
Total		**3,262**	**268.97**	**8.2%**	**370**	**11.3%**	**9.4%**	**307.57**

APPENDIX C (Continued)

SEPARATION / WITHDRAWAL (W/D) EXPERIENCE - NON-HAZARDOUS EMPLOYEES (Females)								
Years of Service	**Age**	**Exposures**	**Expected W/D's**	**Expected %**	**Actual W/D's**	**Actual %**	**Proposed %**	**Expected W/D's (Proposed Rates)**
Under 1	Under 40	71	13.05	18.4%	22	31.0%	25.0%	**17.75**
	40 & Over	46	6.95	15.1%	5	10.9%	12.5%	**5.75**
1 - 2	All Ages	329	52.38	15.9%	61	18.5%	17.0%	**55.93**
3 - 4	All Ages	251	29.05	11.6%	32	12.7%	12.0%	**30.12**
5 - 9	Under 40	120	6.40	5.3%	16	13.3%	9.0%	**10.80**
	40 - 54	102	5.16	5.1%	10	9.8%	7.0%	**7.14**
	55 - 59	26	1.17	4.5%	1	3.8%	4.0%	**1.04**
	60 & Over	36	1.08	3.0%	1	2.8%	3.0%	**1.08**
10 & Over	Under 45	141	7.79	5.5%	9	6.4%	6.0%	**8.46**
	45 - 54	203	7.01	3.5%	8	3.9%	3.5%	**7.11**
	55 & Over	176	7.02	4.0%	5	2.8%	3.0%	**5.28**
Total		**1,501**	**137.06**	**9.1%**	**170**	**11.3%**	**10.0%**	**150.46**

APPENDIX D

COMPARISON OF ACTUAL AND EXPECTED DISABILITIES

DISABILITY EXPERIENCE - FIREFIGHTERS							
Gender	Exposure	Expected Disabilities	Expected Avg Rates	Actual Disabilities	Actual Rates	Average Proposed Rates	Expected Disabilities (New Rates)
Males	913	4.2	0.460%	3	0.329%	**0.397%**	**3.6**
Females	51	0.5	0.980%	0	0.000%	**0.321%**	**0.2**
Total	964	4.7	0.488%	3	0.311%	**0.393%**	**3.8**

DISABILITY EXPERIENCE - POLICE OFFICERS							
Gender	Exposure	Expected Disabilities	Expected Avg Rates	Actual Disabilities	Actual Rates	Average Proposed Rates	Expected Disabilities (New Rates)
Males	1,007	4.5	0.447%	6	0.596%	**0.534%**	**5.4**
Females	171	1.8	1.053%	0	0.000%	**0.454%**	**0.8**
Total	1,178	6.3	0.535%	6	0.509%	**0.523%**	**6.2**

DISABILITY EXPERIENCE - NON-HAZARDOUS EMPLOYEES							
Gender	Exposure	Expected Disabilities	Expected Avg Rates	Actual Disabilities	Actual Rates	Average Proposed Rates	Expected Disabilities (New Rates)
Males	3,799	5.4	0.142%	0	0.000%	**0.073%**	**2.8**
Females	1,759	2.6	0.148%	0	0.000%	**0.079%**	**1.4**
Total	5,558	8.0	0.144%	0	0.000%	**0.075%**	**4.2**

APPENDIX E

Purpose of the Actuarial Valuation

In a defined benefit pension plan, an employer makes a promise to its employees of a lifetime pension. The amount of the monthly pension is determined by a *benefit formula* which is often based upon a multiplier percentage and the number of years of service and the average final earnings of the employee.

The employer must design and follow a systematic plan for advance-funding this obligation. That is accomplished by establishing a pension fund and performing annual actuarial valuations to measure the liabilities associated with the obligation and to calculate how much the employer must contribute to the pension fund in order to make good on its promise.

The calculations in the actuarial valuation are performed each year to re-measure the liabilities. The stakeholders need to know how the plan is doing in its goal of systematically financing the promised benefits. So it is important to make the actuarial calculations in accordance with the professional actuarial standards of practice and the accounting standards.

Role of Actuarial Assumptions

The nature of the pension promise and its systematic funding require long term projections of the employee workforce (using demographic assumptions) and long term projections of the salaries and investment returns (using economic assumptions). The entire actuarial valuation process depends on the selection and use of reasonable actuarial assumptions as to future demographics and future economics. There are many different actuarial assumptions employed in an actuarial valuation. The primary actuarial assumptions include:

1. Rates of Salary Increases
2. Rates of Retirement
3. Rates of Mortality
4. Rates of Employment Separation
5. Rates of Disability
6. Rate of Investment Return

The actuary and plan management must be comfortable with the actuarial assumptions. The assumptions must be reasonable. Without a level of confidence in the reasonableness of the actuarial assumptions, the stakeholders and users of the valuation results cannot have confidence in the results. However, there is no way to have confidence in the actuarial assumptions unless an actuarial experience study is performed to assess the reasonableness of the current assumptions or to change them to be more in line with past experience and with future expectations.

For this reason the Board has requested that we undertake an actuarial experience study to recommend changes to the actuarial assumptions used in the annual actuarial valuation.

APPENDIX F

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: Plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the Plan's funded status); and changes in Plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the Plan's future financial condition include:

1. Investment risk – actual investment returns may differ from the either assumed or forecasted returns;
2. Contribution risk – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the Plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
3. Salary and Payroll risk – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
4. Longevity risk – members may live longer or shorter than expected and receive pensions for a period of time other than assumed;
5. Other demographic risks – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example if the investment return is less (or more) than the assumed rate, the cost of the Plan can be expected to increase (or decrease). Likewise if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution amounts may be considered as a minimum contribution that complies with the pension Board's funding policy and the State statutes. The timely receipt of the actuarially determined contributions is critical to support the financial health of the Plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

Risk Assessment

Risk assessment was outside the scope of this report. Risk assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability. We are prepared to perform such assessment to aid the Board in the decision making process.