District of Columbia Retirement Board

Police Officers and Fire Fighters' Retirement Fund

Teachers' Retirement Fund

Actuarial Experience Study
October 1, 2002 through September 30, 2006

Gregory M. Stump, FSA

Graham A. Schmidt, ASA

Prepared November 21, 2007

EFI* Actuaries • EFI Asset/Liability Management Services, Inc.

The nation's leader in plan-specific, interactive asset allocation optimization counseling

Washington, DC • New York • New Canaan • Seattle • Philadelphia • Sacramento

*Ed Friend, Inc.

Contents

EFI

Executive Summary

Purpose

The purpose of this Actuarial Experience Study is to review the actuarial experience of the District of Columbia Police Officers and Fire Fighters' Retirement Plan and the Teachers' Retirement Plan during the period from October 1, 2002 through September 30, 2006.

The demographic experience – observed rates of retirement, termination, disability, and death – of each plan is compared with the experience expected under the actuarial assumptions used to determine Plan liabilities and cost, and revised assumptions are recommended as appropriate. Current assumptions are based on the most recent experience study conducted in 2003.

Where feasible, experience has been examined separately for male and female members. In some cases, experience has been combined when male and female experience is similar or when there is insufficient data to produce reliable rates by sex.

In addition, the economic assumptions were reviewed. The economic assumptions include the assumed rates of inflation, investment return, and overall active payroll growth.

The purpose of this Section of the Study is to give the reader a summary of the major conclusions that have been reached. Details are presented in later sections of this Report.

Scope of Report

Demographic assumptions relate to all behavioral characteristics of the group. Behavioral characteristics do not include the assumptions concerning future inflation, the real rates of return of the investments in the trust funds, or the anticipated growth in the underlying payroll of the members.

Demographic assumptions include the following:

- Probability of retirement from active service,
- Probability of termination of employment prior to retirement,
- Probability of disability among active employees,
- Probability of death among active employees, and
- Rates of mortality among retired and disabled members and their beneficiaries.

In addition, demographic assumptions include the merit (longevity and promotion) component of individual pay increases. This does not include the inflationary element in pay increases. For example, if inflation is 4% and the employee receives a 5% pay increase, 1% of this increase is deemed "merit".

Economic assumptions include the rate of increase in the cost of living (inflation), which is a part of the overall pay increase assumption discussed above. In addition, a crucial economic assumption is the real rate of return on plan assets -- the return on assets above the rate of inflation.

EFI

Retirement Rates

Over the past four years, actual rates of retirement have been somewhat lower than current actuarial assumptions would predict in total.

New sets of retirement rates are proposed for all groups, bringing assumptions into line with experience. The proposed rates do not vary significantly from the currently assumed rates.

Termination Rates

Overall, terminations among Plan members were well in excess of the number expected, especially among members with low service and especially among Teachers. Accordingly, new termination assumptions are proposed for all groups, which do account for higher expected rates at low service levels.

Disability Rates

The rates of disability observed during this Study were much lower than those assumed for Police and Fire members. Accordingly, new lower rates are recommended. Gender differences among Police members are also accounted for. The actual disability experience for Teachers did not deviate significantly from that expected, so no change is recommended.

Longevity and Promotion Pay Increases

The current actuarial assumption is that the pay of active members will increase annually by assumed inflation, plus additional service based amounts for longevity, promotion, and contractual agreements. In general, current assumptions predict actual pay increases reasonably well. Minor adjustments are recommended for assumed Police and Teachers rates, while no changes are recommended for Fire members.

Mortality Rates

Mortality experience among members and their survivors in this Study was very closely in line with current assumptions for both plans. No changes for retiree or disabled mortality are recommended. A slight modification for assumed mortality rates for active Teachers is proposed.

Economic Assumptions

A review of the Plan's economic assumptions based on the allocation of Plan assets and the recent history of the financial markets indicates that the current economic assumption of 7.25% annual rate of return and a 5.0% annual rate of inflation is rather conservative, representing a real return of 2.25%. We recommend changing these assumptions to 7.5% total return (net of investment expenses), and 3.5% inflation and base salary increases. This represents a real return of 4.0%. These new

EFI

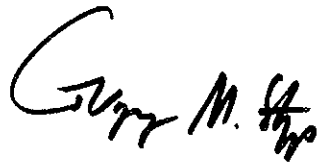
assumptions represent a more realistic expectation, while still maintaining a degree of conservatism.

Cost Impact

Whenever actuarial assumptions are changed to reflect future expectations that differ from those currently assumed, there will be an impact on Plan costs. The contribution rates for each plan are expected to decrease significantly due to new assumptions if adopted. This is primarily due to a lower expected future inflation level. It is important to use the most reasonable expectations to avoid excessive front or back-loading of the Funds, and to preserve intergenerational equity.

Actuarial Certification

The report has been prepared in accordance with generally accepted actuarial methods and procedures as described in Actuarial Standards of Practice (ASOPs) 27 (Selection of Economic Assumptions for Measuring Pension Obligations) and 35 (Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations). EFI will answer any questions from the Retirement Board or DCRB staff regarding its methodology or conclusions.



Gregory M. Stump, FSA, EA, MAAA
(484) 442-8337

Graham A. Schmidt, ASA, MAAA
(484) 946-4963

EFI

Introduction

Importance of Accurate Assumptions

The liabilities and costs calculated in actuarial valuations and cost studies are based on a projection of future conditions. The actuary makes assumptions concerning the rates of retirement, termination, disability, and death among plan members. In addition, the actuary must project future earnings on plan assets, inflation, and growth in the pay of active members.

The actuary sets his assumptions based on past experience and future expectations. In setting demographic assumptions, such as rates of retirement, the past experience of the covered group of employees is often the best predictor of future behavior. When establishing economic assumptions, such as the expected return on plan assets, the historical behavior of the investment markets can serve as a guide.

Actuarial funding methods are designed so that, if the actuarial assumptions are met, plan costs will generally be a level percentage of member pay from year to year. When actual economic or demographic experience varies from our assumptions, plan costs will rise or fall accordingly. Therefore, it is worth the effort to make our best estimate of future conditions so that the plan costs computed by the actuary will be as stable and predictable as possible.

Purposes of the Experience Study

The first goal of this Experience Study is to review the recent past demographic experience of each group. We seek to understand the behavior of the participating members so that we can recommend actuarial assumptions concerning future demographic experience.

The second goal of this Study is to recommend economic assumptions to be used in computing liabilities and costs. These economic assumptions include the expected rate of return on Plan assets and the anticipated rate of increase in the Consumer Price Index (CPI). These assumptions are determined based on the investment strategy adopted by the Board and on the past behavior of the capital markets and the CPI.

Once adopted, the assumptions recommended by this Study will be used to determine future liabilities and costs and for purposes of evaluating prospective changes in benefits, eligibility conditions, and other aspects of the Plan's operations.

Methodology (Demographic Assumptions)

One goal of this Study is to compute the probability of death, disability, retirement, and termination at each age for active members and the probability of death at each age for inactive members.

To this end, we proceed as follows:

EFI

- We count the number of members leaving for each cause during the term of the Study. This is the number of decrements.
- We count the number of members per year who could have left for each cause during the Study. This is the exposure.
- When the exposure is sufficient, we divide the number of decrements by the exposure at each combination of age and service for an employee group to determine the probability of leaving due to the cause in question.

It is common for assumed retirement rates to be 100% once a certain age and/or service level is reached (e.g. all members assumed to retire after age 65). In order to avoid skewed results, it is often necessary to include only retirement data up to the assumed ultimate age or service level. It is also sometimes necessary to exclude experience when it is no longer applicable (e.g. retirement eligibility for a closed group).

When there is insufficient exposure to derive statistically reliable rates by age and service, we may combine exposures and decrements for groups of ages and service. Alternatively, we may compare the total number of actual decrements with the total number of decrements predicted by a standard actuarial table, and adopt a table that predicts decrements, in total, reasonably close to those that have been observed.

Methodology (Economic Assumptions)

The Plan's economic assumptions are critically important in computing actuarial liabilities and costs. A careful determination of these assumptions requires an analysis of the past performance of the capital markets and the Plan's future investment outlook.

To this end, we proceed as follows:

- Based on a detailed analysis of recent past history and reasonable expectations for the future, a long term projection of the rate of inflation is determined.
- Based on the Plan's investment strategy and historical rates of return on various asset classes, the long term *real* rate of return on assets is projected. This is the return on assets in excess of inflation.
- The projected rate of inflation is combined with the assumption concerning merit pay increases to project future members' pay.
- The rate of inflation is combined with the estimated real return on assets to determine the overall return on assets.

Of course, any estimate of future inflation and asset returns is difficult. Over time, there will be actuarial gains and losses as experience deviates from our assumptions. We strive to set assumptions using careful analysis in the hope that the future gains and losses will offset each other, thereby making our cost computations as accurate as possible in the long run.

EFI

Organization of Report

The first section of the Report deals with decrements among active members and also includes consideration of the merit component of pay increases.

The second section of the Report deals with mortality among active and inactive members.

The third section of the Report concerns economic assumptions.

A Conclusion section summarizes presents an overall summary of the demographic analysis.

An Appendix contains a summary of benefits for each plan.

Note: All charted presentations in the report relate to either active members (reflected by the prefix identifier "A"...such as Chart A-1), inactive members (reflected by the prefix identifier "I"...such as Chart I-1), or economic data (identifier "E").

Section 1: Active Decrements

EFI

Service Retirement

Current Assumptions

Summary of Experience versus Current Assumptions

	Eligible Exposure	Actual Retirements	Expected Retirements	Actual to Expected Ratio
Police (Ages 40-60)	831	157	222	70.6%
Fire (Service≥25)	493	82	107	76.3%
Teachers (Ages 55-75)	3,454	855	827	103.4%
Total	**4,778**	**1,094**	**1,156**	**94.6%**

	Actual Average Age	Expected Average Age
Police	51.6	52.4
Fire	52.3	54.1
Teachers	59.9	61.9

- The actual number of retirements is somewhat below that expected for Police and Fire and in total.
- Most Police retirements have occurred between the ages of 50 and 54, with somewhat lower rates before and after these ages.
- A service based correlation can be seen among Fire retirements, with the highest rates of retirement occurring after 30 years of service.
- Retirements among Teachers who were eligible for voluntary retirement were closely in line with expectations in aggregate, but not at ages under 62 and over 70. The actual rates were higher than expected at younger ages and lower than expected at older ages.
- There were also a number of involuntary retirements (not included above) among Teachers at ages 50 through 59.

Recommendations

Summary of Experience versus Proposed Assumptions

	Eligible Exposure	Actual Retirements	Expected Retirements	Actual to Expected Ratio
Police (Ages 40-60)	831	157	169	93.1%
Fire (Service≥25)	493	82	95	86.1%
Teachers (Ages 55-75)	3,454	855	858	99.7%
Total	**4,778**	**1,094**	**1,122**	**97.5%**

	Actual Average Age	Expected Average Age
Police	51.6	51.8
Fire	52.3	52.8
Teachers	59.9	60.2

- New rates for Police are proposed which reflect a lower number of expected retirements, in line with recent experience.
- New service based rates are proposed for Fire, which reflect the recent experience. The current age based rates are still appropriate after 35 years of service.
- New voluntary rates are proposed for Teachers, which reflect increased probability of retirement at younger ages, and an older ultimate retirement age.
- Additionally, rates for involuntary retirement are proposed for Teachers ages 50 through 59 (see table below).
- As shown in Charts A-1 through A-3 below, the proposed assumptions are closely in line with actual experience for all groups.

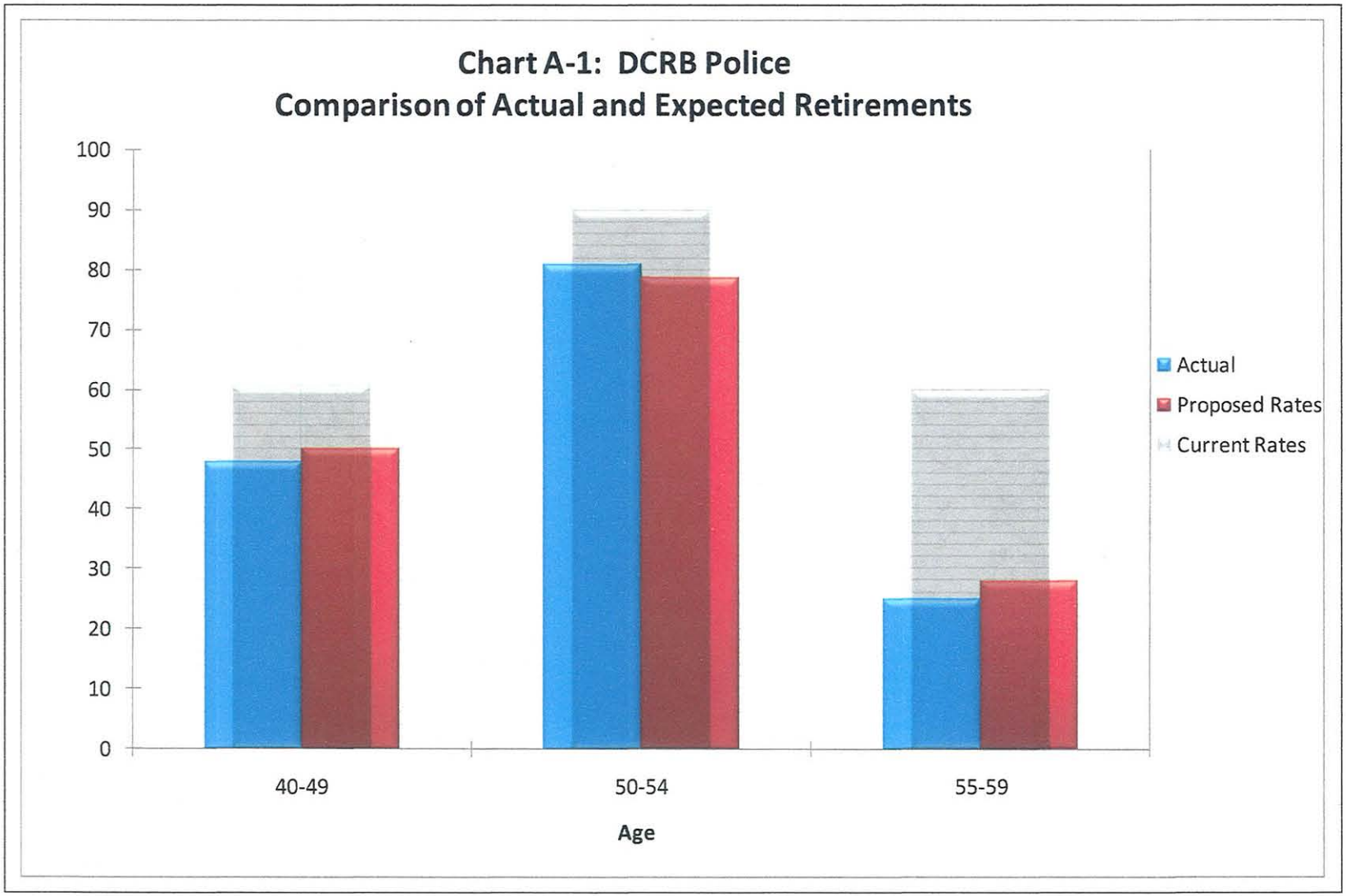


Chart A-1: DCRB Police
Comparison of Actual and Expected Retirements
100
90
80
70
60
50
40
30
20
10
0
40-49
50-54
55-59
Age
Actual
Proposed Rates
Current Rates

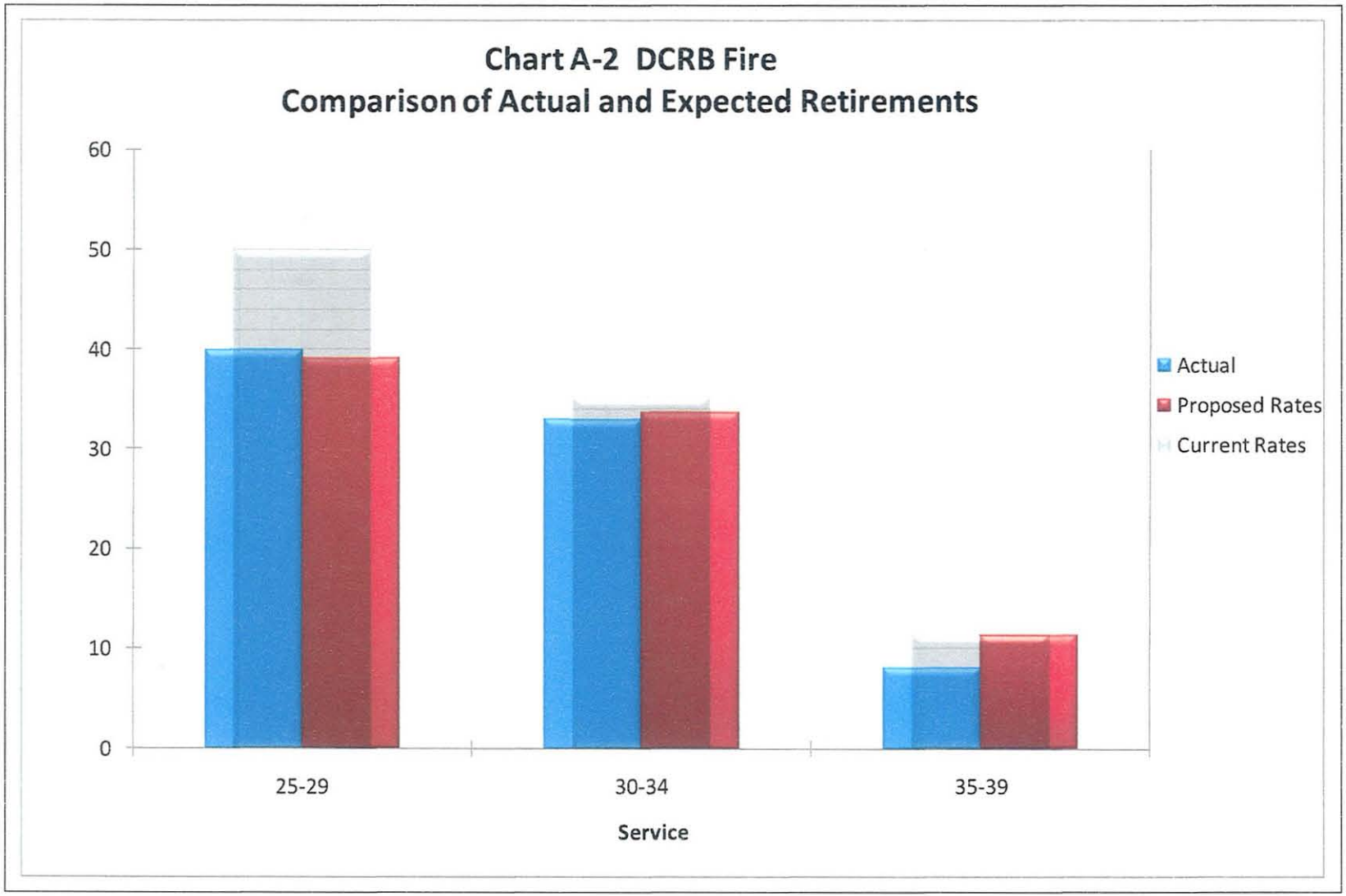


Chart A-2 DCRB Fire
Comparison of Actual and Expected Retirements
60
50
40
30
20
10
0
25-29
30-34
35-39
Service
Actual
Proposed Rates
Current Rates

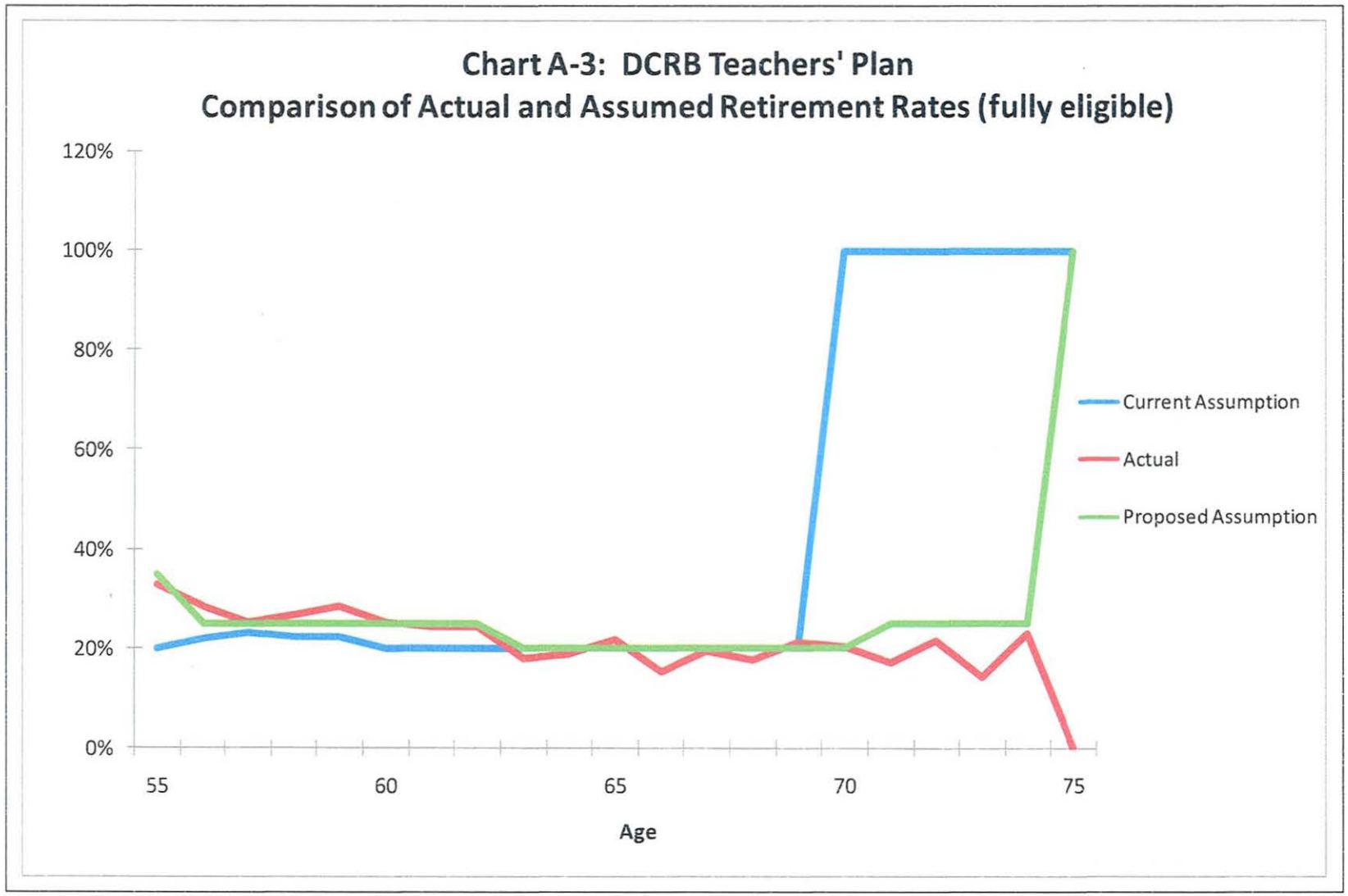


Chart A-3: DCRB Teachers' Plan
Comparison of Actual and Assumed Retirement Rates (fully eligible)
120%
100%
80%
60%
40%
20%
0%
55
60
65
70
75
Age
Current Assumption
Actual
Proposed Assumption

Retirement Rates – Current Assumed Rates

Age	Police	Fire
40	7.5%	2%
41	10%	3%
42	12%	4%
43	15%	5%
44	15%	5%
45	15%	6%
46	15%	7%
47	17%	8%
48	19%	9%
49	21%	11%
50	23%	13%
51	25%	15%
52	25%	20%
53	25%	25%
54	30%	30%
55	40%	35%
56	50%	35%
57	50%	35%
58	50%	35%
59	50%	35%
60+	100%	100%

It is also assumed that all Police and Fire members will retire upon attainment of 31 years of service or more.

Retirement Rates – Proposed Rates

Age	Police
40-49	15%
50-59	22%
60+	100%

It is also proposed that the 100% retirement rates after 30 years of service be removed.

Service	Fire
25-29	12%
30-34	25%
35+	Maintain current age based assumption

EFI

Retirement Rates – Current Assumed Rates (continued)

Age	Teachers	
	First Year Eligible	All Other Years
50	20%	20%
51	20%	20%
52	20%	20%
53	20%	20%
54	20%	20%
55	20%	20%
56	40%	20%
57	60%	20%
58	60%	20%
59	60%	20%
60	20%	20%
61	20%	20%
62	20%	20%
63	20%	20%
64	20%	20%
65	20%	20%
66	20%	20%
67	20%	20%
68	20%	20%
69	20%	20%
70+	100%	100%

Retirement Rates – Proposed Rates (continued)

Age	Teachers	
	Normal Retirement	Involuntary Retirement
50	10%*	0.5%
51	10%*	0.5%
52	10%*	0.5%
53	10%*	0.5%
54	10%*	0.5%
55	35%	8%
56	25%	8%
57	25%	8%
58	25%	8%
59	25%	8%
60	25%	N/A
61	25%	N/A
62	25%	N/A
63	20%	N/A
64	20%	N/A
65	20%	N/A
66	20%	N/A
67	20%	N/A
68	20%	N/A
69	20%	N/A
70	20%	N/A
71	25%	N/A
72	25%	N/A
73	25%	N/A
74	25%	N/A
75+	100%	N/A

- For Teachers hired on or after 11/16/1996 only

Termination

Current Assumption

Summary of Experience versus Current Assumptions

	Eligible Exposure	Actual Terminations	Expected Terminations	Actual to Expected Ratio
Police	13,803	461	328	140.4%
Fire	4,908	69	77	89.3%
Teachers	17,927	2,722	1,592	171.0%
Total	**36,638**	**3,252**	**1,997**	**162.8%**

	Actual Average Age	Expected Average Age
Police	34.8	32.5
Fire	32.8	34.6
Teachers	36.7	32.6

- The actual number of terminations was much higher than that expected for Police and Teachers.
- Over one-third of Police and Fire terminations and a large portion of Teacher terminations have been members with low service.
- Actual rates for male Police officers under the age of 35 are somewhat higher than the rates for female officers.
- There have been a very large number of terminations among Teachers, due largely to recent staff reductions.
- It is currently assumed that all terminating vested Police and Fire members receive a refund of their contributions, however, data shows that about 20% of them are instead expected to receive a deferred annuity benefit.
- Conversely, all Teacher vested terminations are expected to receive a deferred annuity benefit; however, 33% of those recently terminated instead received a refund of their contributions.

Recommendation

Summary of Experience versus Proposed Assumptions

	Eligible Exposure	Actual Terminations	Expected Terminations	Actual to Expected Ratio
Police	13,803	461	432	106.7%
Fire	4,908	69	70	98.9%
Teachers	17,927	2,722	2,241	121.5%
Total	**36,638**	**3,252**	**2,743**	**118.6%**

	Actual Average Age	Expected Average Age
Police	34.8	33.9
Fire	32.8	32.5
Teachers	36.7	36.1

- Higher initial rates are proposed for Police and Fire members, which align closely with recent experience, as shown in Chart A-4.
- Separate male and female rates for members with three or more years of service are proposed for Police (see Charts A-5 below).
- Age based rates for members with more than two years of service are proposed for Fire (see Chart A-6 below).
- Three sets of rates based on various service levels are proposed for Teachers (Chart A-7). Rates within each level vary by age. In consideration of the staff reductions, recent experience is only partially recognized.
- Assuming that a portion of vested terminations (20% for Police/Fire and 65% for Teachers) will receive a deferred benefit is proposed. The remainder will be assumed to receive a refund of contributions.
- Proposed assumptions bring actual experience more in line with that expected, in both number of terminations and average age.

EFI

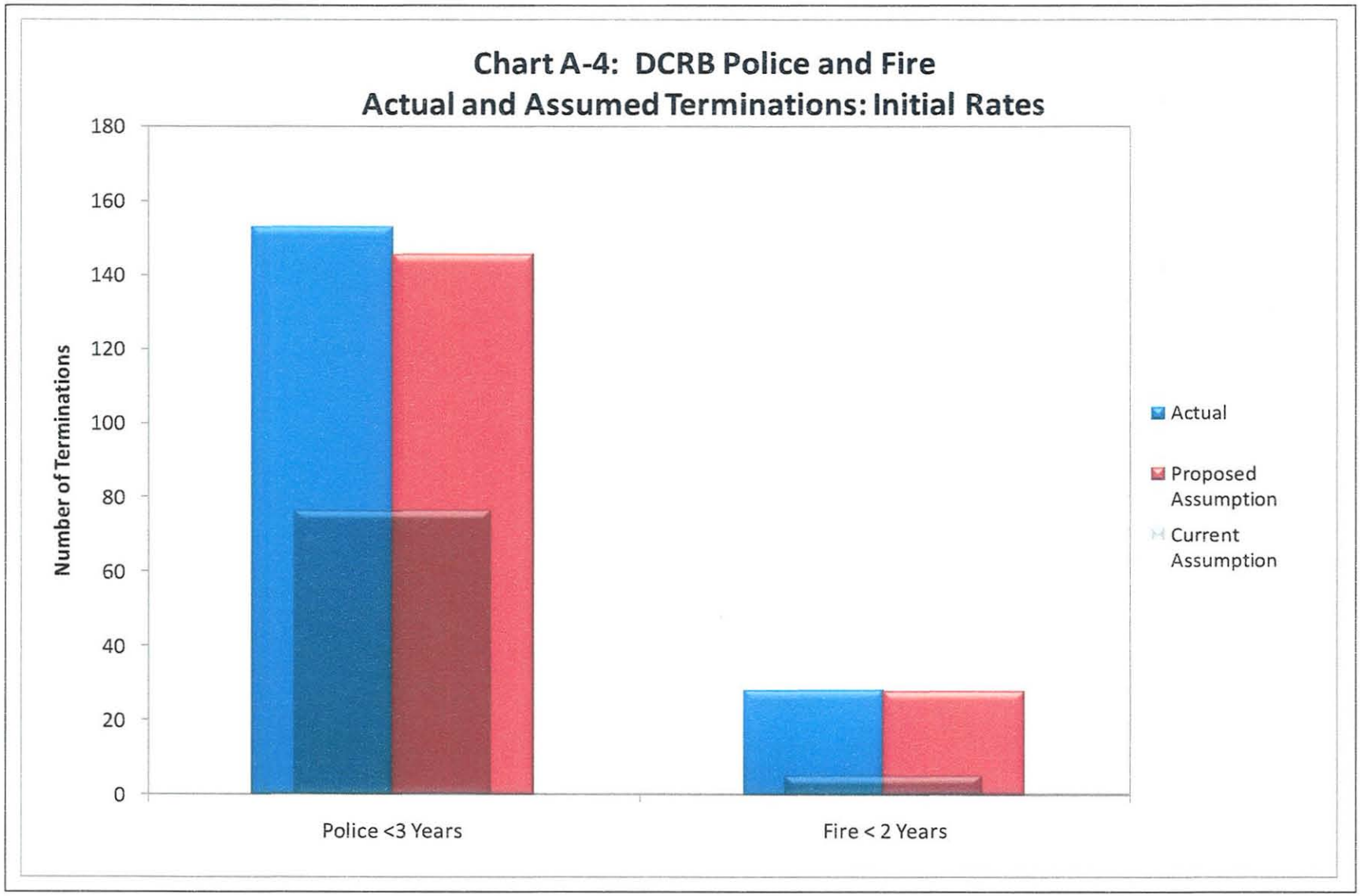
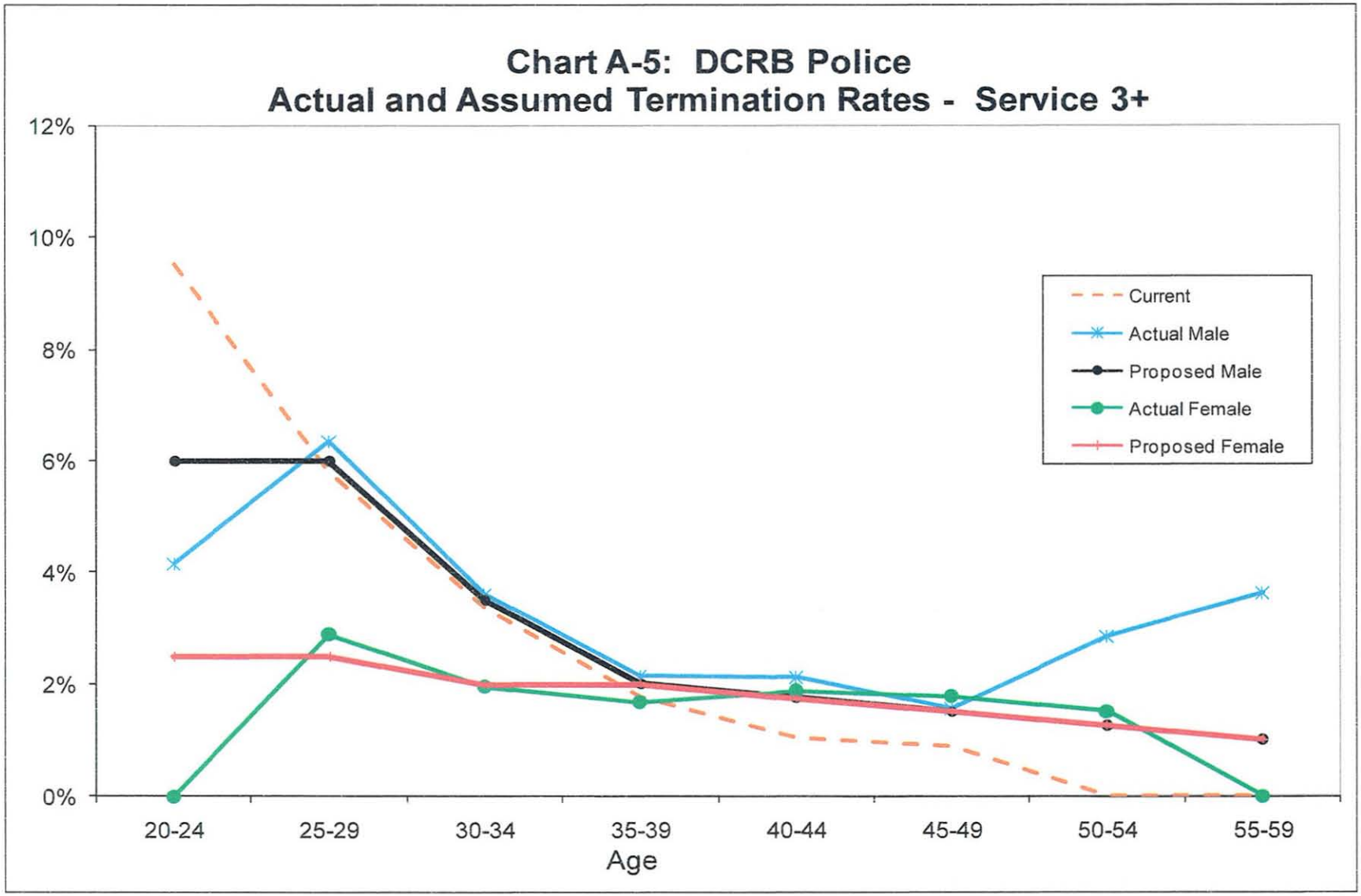


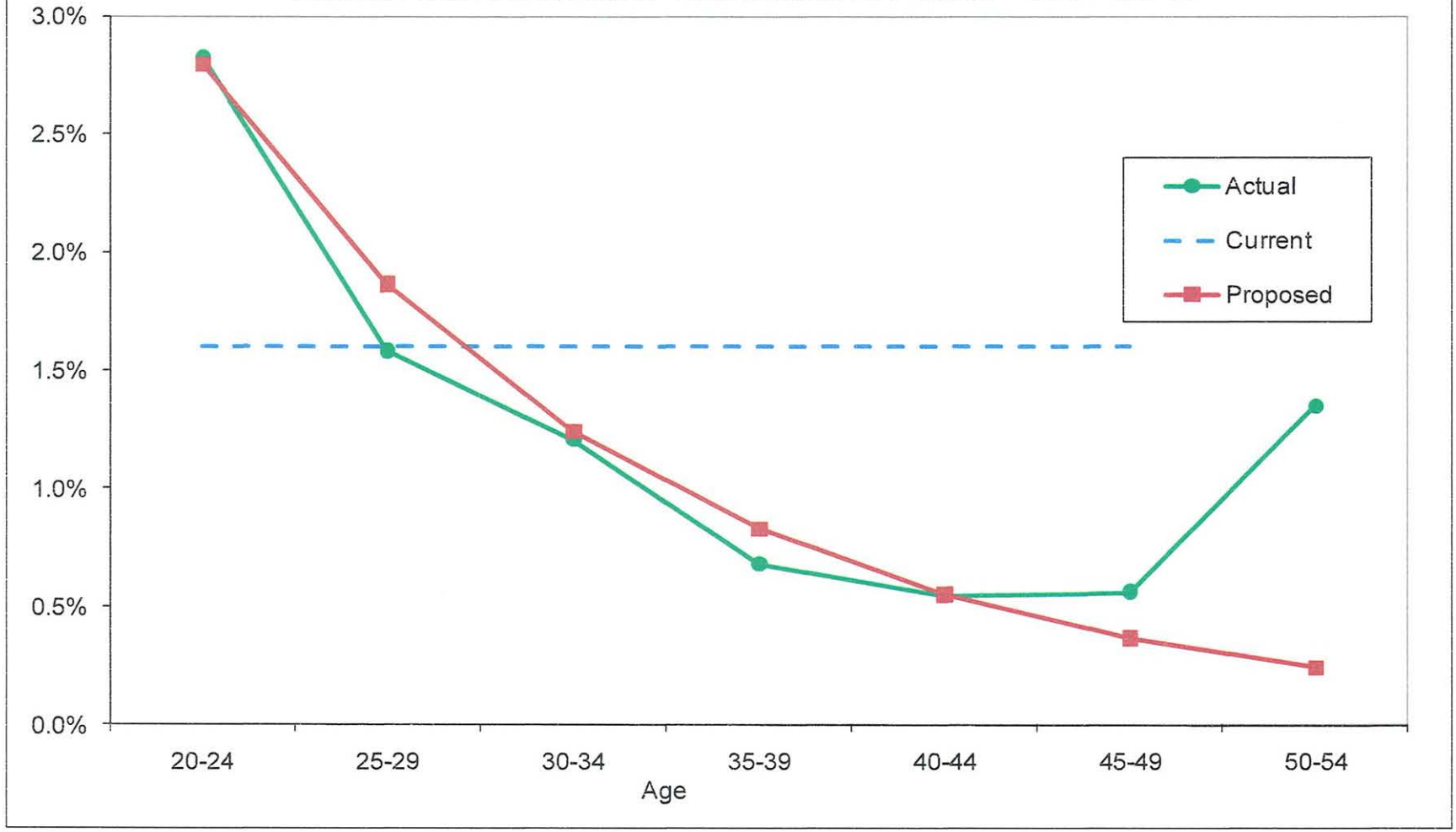
Chart A-4: DCRB Police and Fire
Actual and Assumed Terminations: Initial Rates
Number of Terminations
180
160
140
120
100
80
60
40
20
0
Police <3 Years
Fire < 2 Years
Actual
Proposed Assumption
Current Assumption

Chart A-5: DCRB Police
Actual and Assumed Termination Rates - Service 3+

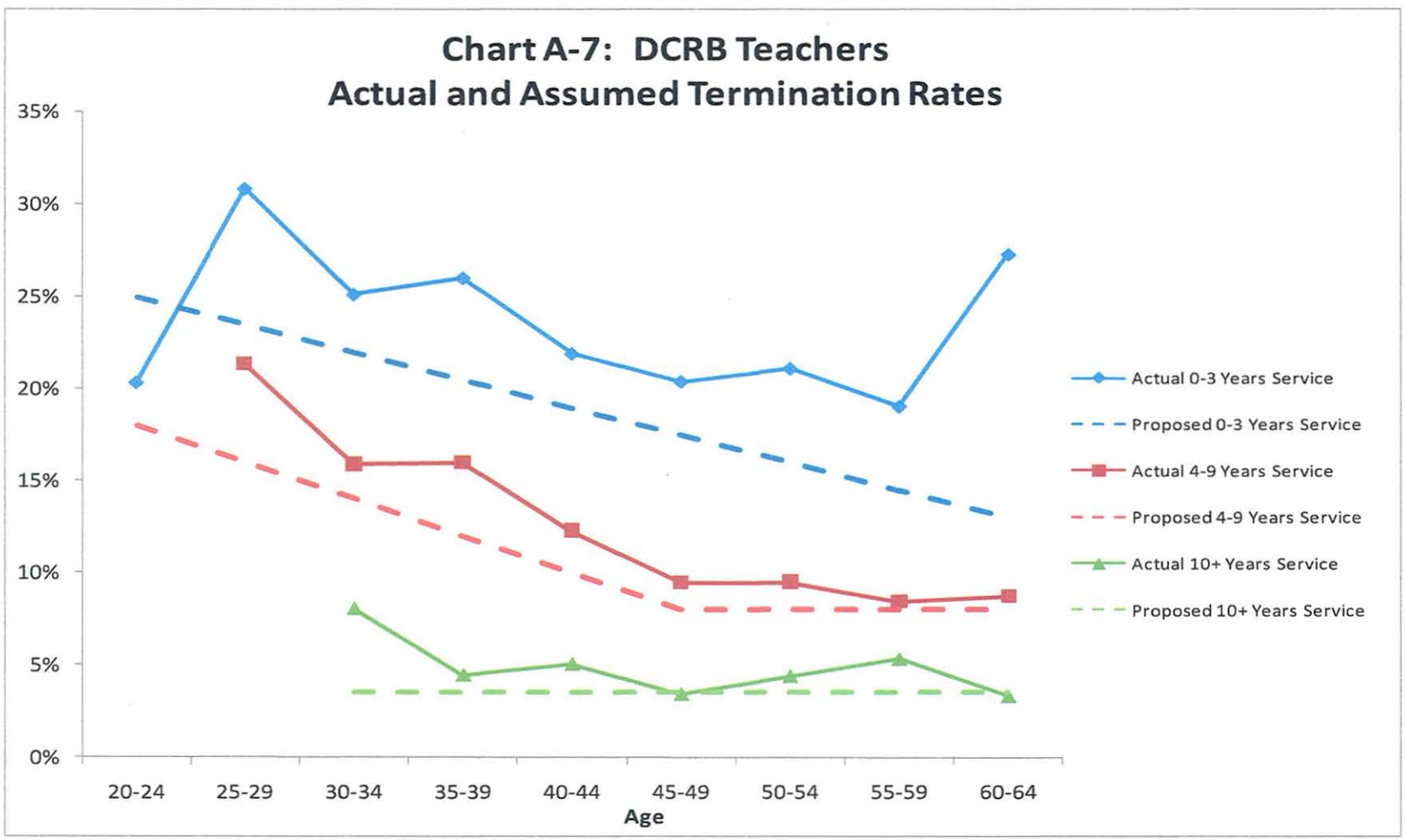


EFI

Chart A-6: DCRB Fire
Actual and Assumed Termination Rates - Service 2+



EFI



Charts A-7 shows the rates of termination among different service levels. Due to the recent Teachers staff reductions, there have been a very large number of terminations recently and actual rates may be higher than can be expected in the future. Thus, proposed rates maintain the same pattern of terminations, but reflect a lower overall level. Chart A-7.1 shows the number of terminations versus current and proposed assumptions.

EFI

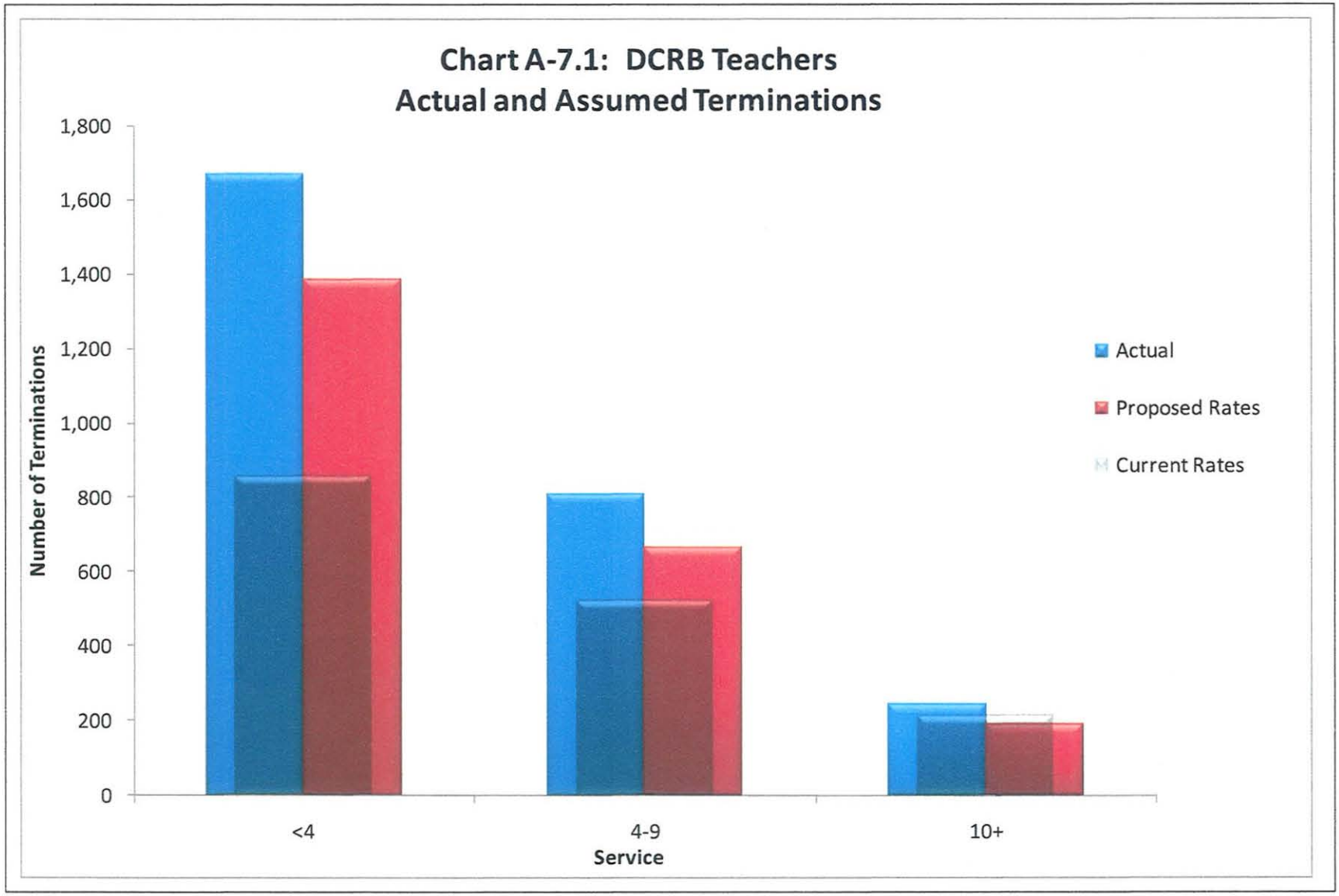


Chart A-7.1: DCRB Teachers
Actual and Assumed Terminations
Number of Terminations
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
<4
4-9
10+
Service
Actual
Proposed Rates
Current Rates

Termination Rates – Current Representative Rates

Age	Police	Fire	Teachers
20	12.13%	1.60%	25.00%
25	6.57%	1.60%	23.00%
30	4.23%	1.60%	16.00%
35	2.32%	1.60%	11.00%
40	1.33%	1.60%	6.80%
45	1.03%	1.60%	4.80%
50	0.00%	0.00%	3.60%
55	0.00%	0.00%	0.00%
60	0.00%	0.00%	0.00%

No terminations are assumed for those who are eligible to retire.

Termination Rates – Proposed Rates

	Police				Fire	
Age	<3 Years Service Male	<3 Years Service Female	3+ Years Service Male	3+ Years Service Female	<2 Years Service	2+ Years Service
20-24	10.0%	8.0%	6.00%	2.50%	9.0%	2.80%
25-29	10.0%	8.0%	6.00%	2.50%	9.0%	1.87%
30-34	10.0%	8.0%	3.50%	2.00%	9.0%	1.24%
35-39	10.0%	8.0%	2.00%	2.00%	9.0%	0.83%
40-44	10.0%	8.0%	1.75%	1.75%	9.0%	0.55%
45-49	10.0%	8.0%	1.50%	1.50%	9.0%	0.37%
50-54	10.0%	8.0%	1.25%	1.25%	9.0%	0.25%
55-59	10.0%	8.0%	1.00%	1.00%	9.0%	0.00%
60+	10.0%	8.0%	0.00%	0.00%	9.0%	0.00%

	Teachers		
Age	0-3 Years Service	4-9 Years Service	10+ Years Service
20-24	25.00%	18.00%	N/A
25-29	23.50%	16.00%	N/A
30-34	22.00%	14.00%	3.50%
35-39	20.50%	12.00%	3.50%
40-44	19.00%	10.00%	3.50%
45-49	17.50%	8.00%	3.50%
50-54	16.00%	8.00%	3.50%
55-59	14.50%	8.00%	3.50%
60-64	13.00%	8.00%	3.50%
65+	0.00%	0.00%	0.00%

No terminations are assumed for those who are eligible to retire.

EFI

Disability

Current Assumption

Summary of Experience versus Current Assumptions

	Eligible Exposure	Actual Disabilities	Expected Disabilities	Actual to Expected Ratio
Police	14,657	118	204	57.8%
Fire	5,534	10	56	17.7%
Teachers	24,038	50	56	89.1%
Total	**20,215**	**178**	**316**	**56.3%**

	Actual Average Age	Expected Average Age
Police	41.3	42.8
Fire	42.0	44.2
Teachers	53.8	51.1

- Overall, the number of disabilities was much lower than expected.
- The number of disabilities among male Police members was lower than expected while the number among females was relatively close to expectations.
- The actual rates of disability among Fire members were significantly lower than expected.
- There have been no Police disabilities after age 55.
- 50% of disabilities among Police and Fire members are assumed to occur in the line of duty. The actual proportion was somewhat higher (72%).
- The rates of disability observed among Teachers were in reasonable agreement to those expected.

Recommendation

Summary of Experience versus Proposed Assumptions

	Eligible Exposure	Actual Disabilities	Expected Disabilities	Actual to Expected Ratio
Police	14,657	118	118	99.8%
Fire	5,534	10	28	35.5%
Teachers	24,038	50	56	89.1%
Total	**20,215**	**178**	**202**	**88.1%**

	Actual Average Age	Expected Average Age
Police	41.3	41.8
Fire	42.0	44.2
Teachers	53.8	51.1

- Proposed rates for male Police members are 50% lower than the currently assumed rates. An elimination of assumed disabilities after age 55 is also recommended for males and females.
- Proposed rates for Fire members are 50% lower than the rates currently assumed.
- An increase in the assumed proportion of duty related disabilities from 50% to 75% is proposed for Police and Fire members.
- No change to the current disability assumption is proposed for Teachers.
- Proposed rates match closely with actual experience for all groups at all age levels as shown in Charts A-8 through A-10 below.

EFI

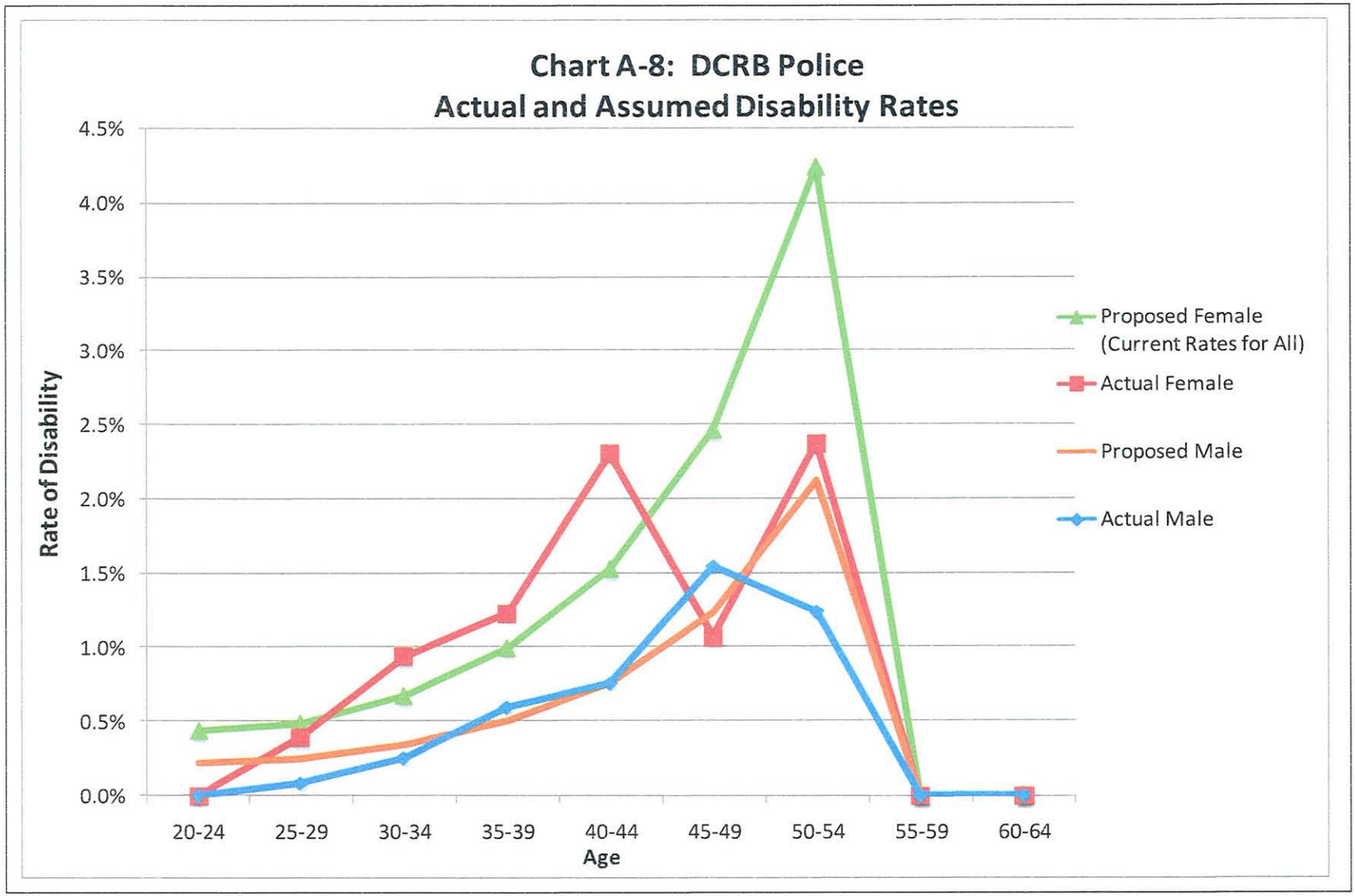


Chart A-8: DCRB Police
Actual and Assumed Disability Rates
Rate of Disability
4.5%
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
Age
Proposed Female (Current Rates for All)
Actual Female
Proposed Male
Actual Male

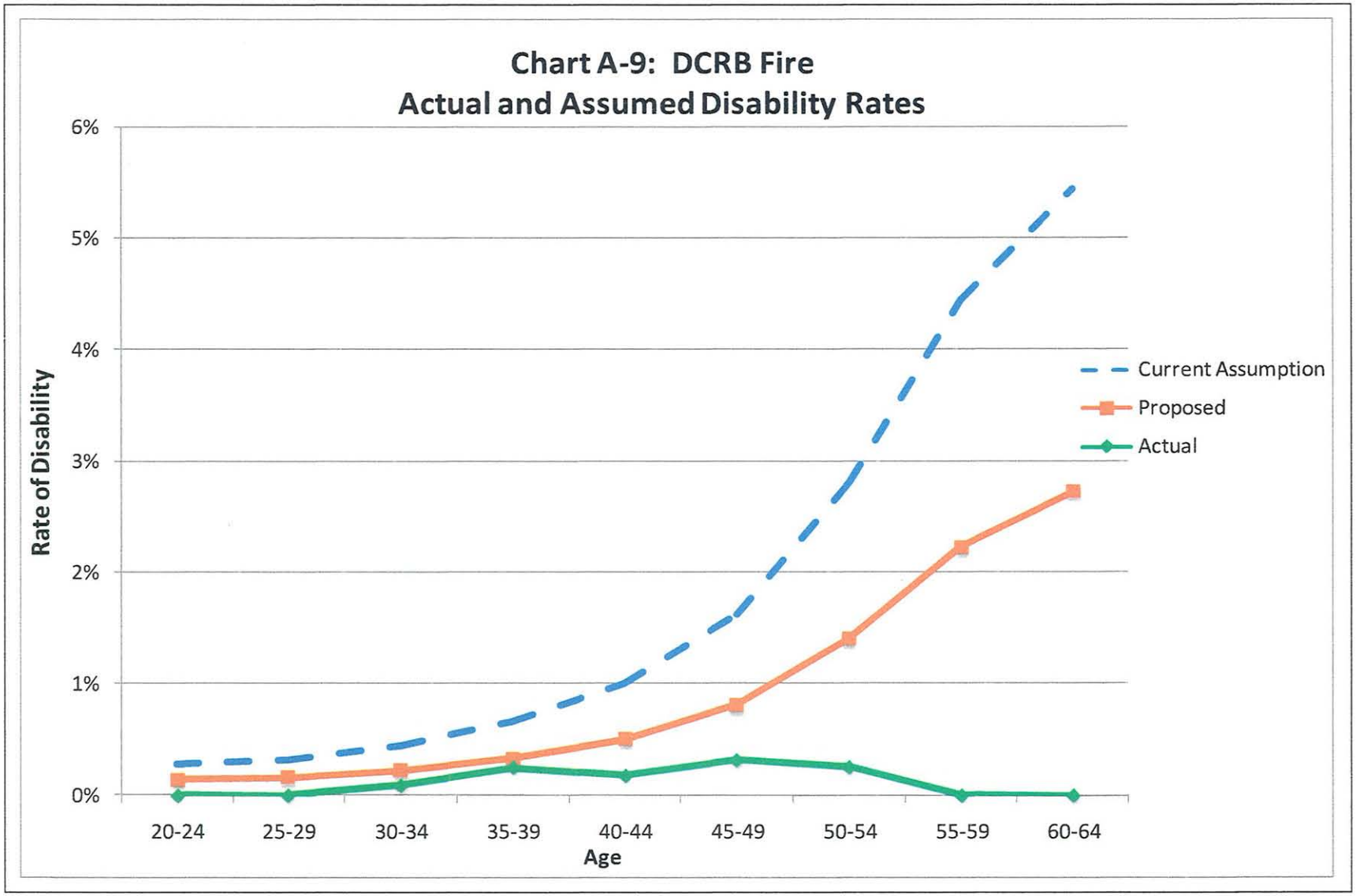
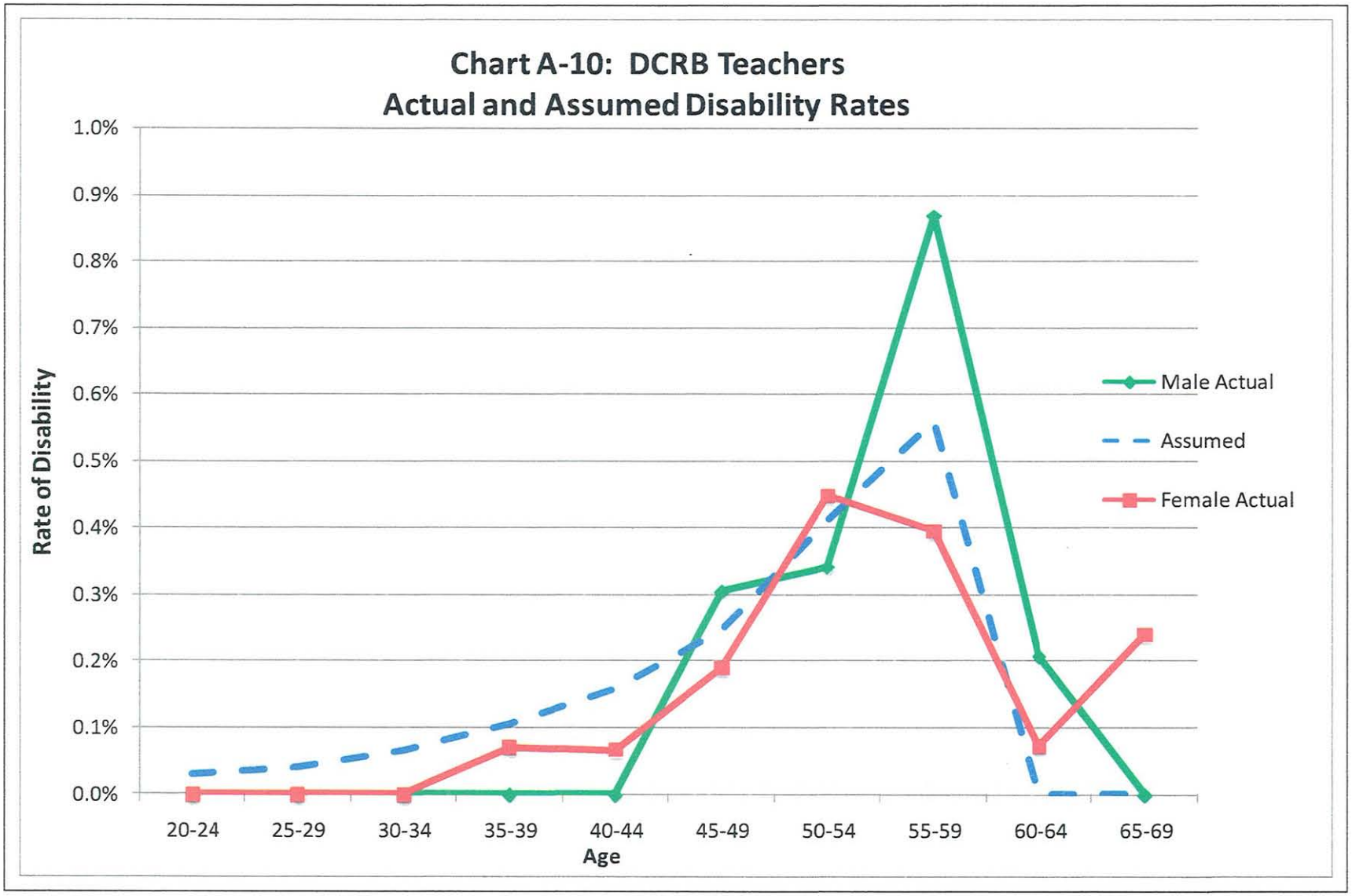


Chart A-9: DCRB Fire
Actual and Assumed Disability Rates
Rate of Disability
6%
5%
4%
3%
2%
1%
0%
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
Age
Current Assumption
Proposed
Actual

Chart A-10: DCRB Teachers
Actual and Assumed Disability Rates



Disability Rates – Current Representative Rates

Age	Police	Fire	Teachers
20	0.4383%	0.2893%	0.0300%
25	0.5750%	0.3795%	0.0572%
30	0.8500%	0.5610%	0.0932%
35	1.2500%	0.8250%	0.1292%
40	1.9633%	1.2958%	0.2040%
45	3.2500%	2.1450%	0.3212%
50	5.7750%	3.8115%	0.5520%
55	8.2500%	5.4450%	0.5700%
60	8.2500%	5.4450%	0.0000%

Disability Rates – Proposed Representative Rates

	Police		Fire	Teachers
Age	Male	Female		
20	0.4383%	0.2192%	0.1447%	0.0300%
25	0.5750%	0.2875%	0.1898%	0.0572%
30	0.8500%	0.4250%	0.2805%	0.0932%
35	1.2500%	0.6250%	0.4125%	0.1292%
40	1.9633%	0.9817%	0.6479%	0.2040%
45	3.2500%	1.6250%	1.0725%	0.3212%
50	5.7750%	2.8875%	1.9058%	0.5520%
55	8.2500%	4.1250%	2.7225%	0.5700%
60	8.2500%	4.1250%	2.7225%	0.0000%

Longevity and Promotion Pay Increases

Pay increases consist of three components: increases due to cost of living maintenance (inflation), increases related to productivity (increases in the *relative* standard of living), and Increases due to merit, promotion, and longevity. Increases due to cost of living and productivity are addressed in the Economic Assumptions section of this report.

In the charts below, the average pay of the active members is plotted against service. In addition, a curve is fitted to the average pay data, and this curve is used to determine a pay increase due to merit. This is a *transverse* study of longevity and promotion pay increases: The data is taken as of a particular point in time, so that the effects of past inflation do not confound the results.

Police

Current Assumption (Sample Rates)

Years of Service	Assumed Increase
0	5.0%
5	3.6%
10	2.6%
20	2.0%
30	0.5%

- Additional increases for longevity are assumed at 20, 25, and 30 years of service.
- Actual salaries are in reasonable agreement with current assumptions for most service levels.
- No definitive pattern exists after 28 years of service.

Recommendation (Sample Rates)

Years of Service	Assumed Increase
0	5.0%
5	3.6%
10	2.6%
20	2.5%
30	0.5%

- Slight upward adjustments to assumed salary increase rates at 20 -25 years of service are proposed.
- See Chart A-11 below for an illustration of actual pay versus current and proposed assumptions.

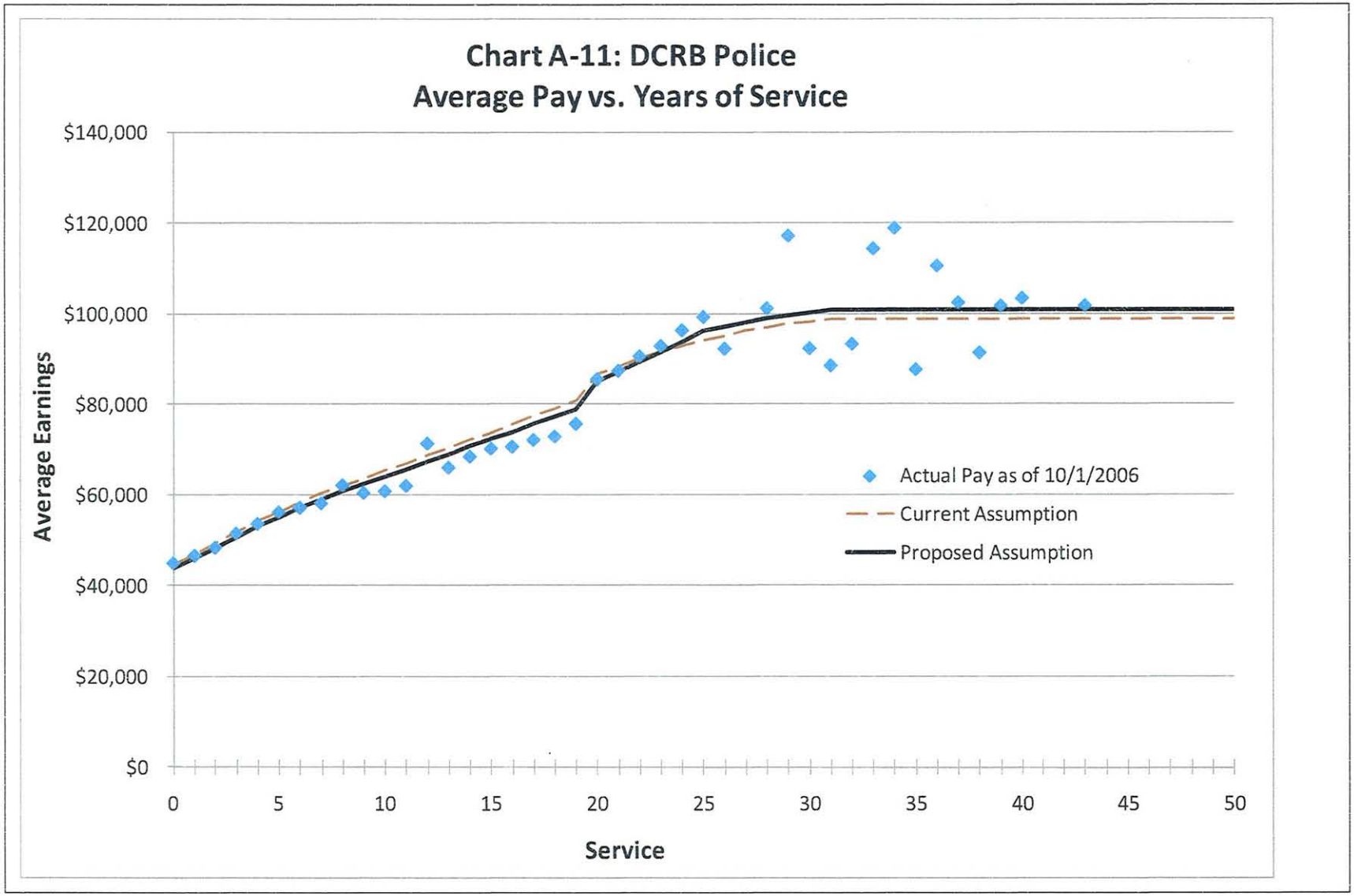
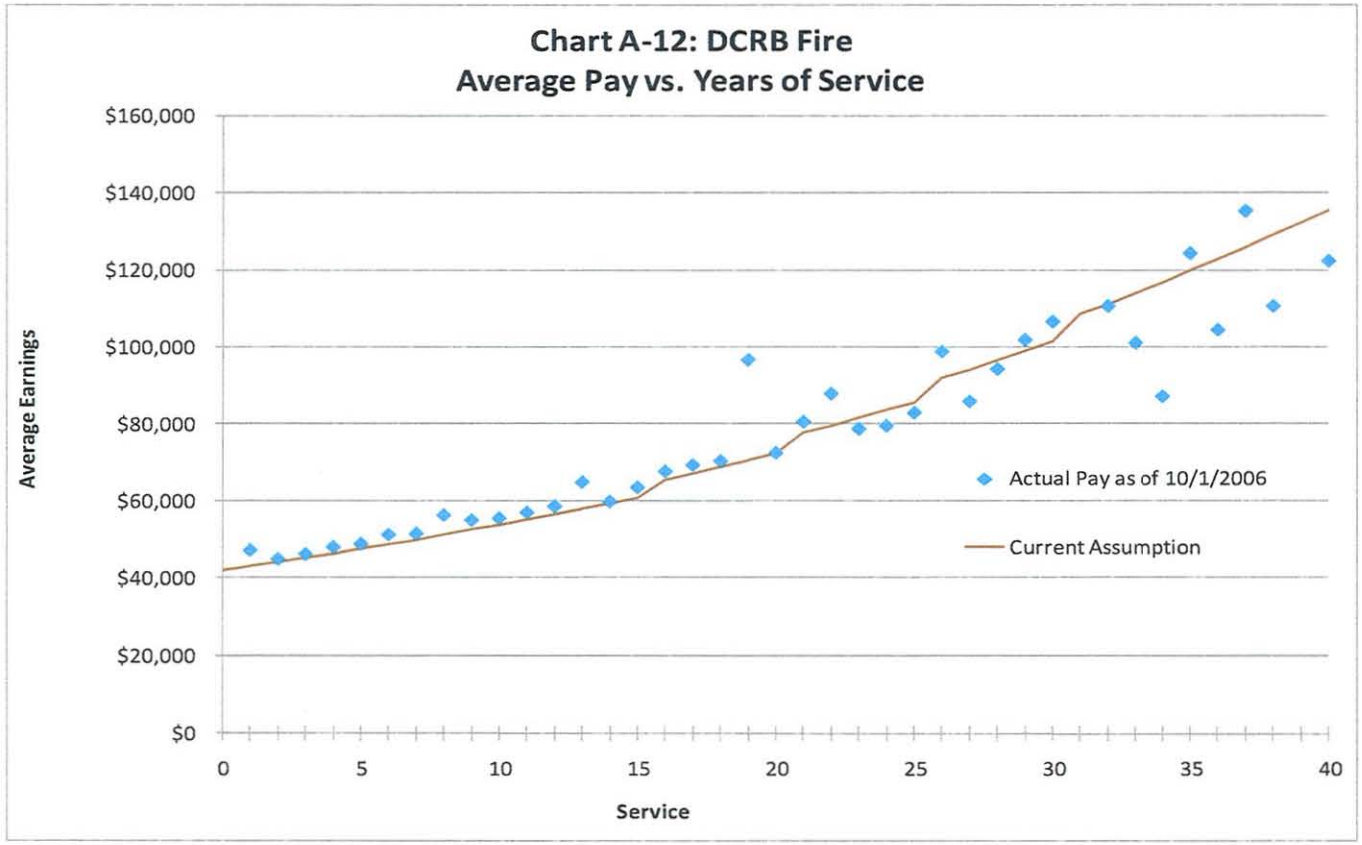


Chart A-11: DCRB Police
Average Pay vs. Years of Service
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
Average Earnings
0
5
10
15
20
25
30
35
40
45
50
Service
Actual Pay as of 10/1/2006
Current Assumption
Proposed Assumption

Fire

Current Assumption	Recommendation
• 2.5% per year increases assumed for each year, plus additional longevity increases at 15, 20, 25, and 30 years of service • The actual pay amounts are in very close agreement with current assumptions at nearly all service levels.	• No changes are recommended • Chart A-12 below shows a comparison of actual pay versus current assumptions.



Teachers

Current Assumption (Sample Rates)

Years of Service	Assumed Increase
0	4.0%
5	4.0%
10	3.0%
15	2.0%
20	1.0%
30	0.4%

- Actual pay levels vary slightly from those assumed.
- Actual increases are slightly lower than expected during mid-career years and later.

Recommendation (Sample Rates)

Years of Service	Assumed Increase
0	4.0%
5	4.0%
10	3.0%
15	0.5%
20	0.2%
30	0.2%

- Lower rates are proposed at service levels greater than 10.
- See Chart A-13 below for a comparison of actual pay levels versus current and proposed assumptions.

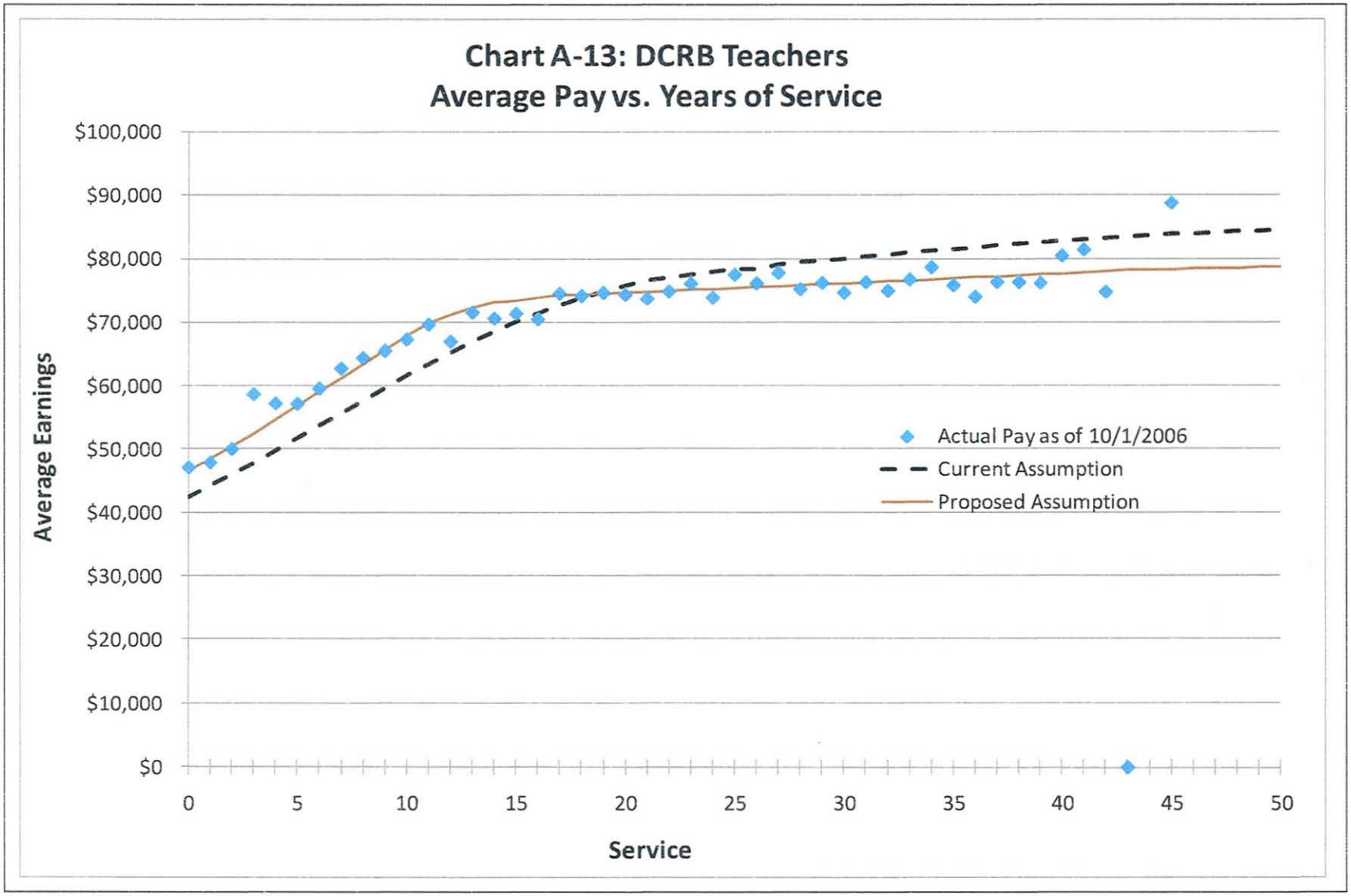


Chart A-13: DCRB Teachers
Average Pay vs. Years of Service
Average Earnings
$100,000
$90,000
$80,000
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0
0
5
10
15
20
25
30
35
40
45
50
Service
Actual Pay as of 10/1/2006
Current Assumption
Proposed Assumption

Section 2: Mortality Analysis

Police and Fire

Current Assumption

Summary of Experience versus Current Assumptions

ACTIVE	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	16,494	16	24.9	64.3%
Females	3,697	3	2.9	102.0%
Combined	**20,191**	**19**	**27.8**	**68.3%**

RETIREES & BENEFICIARIES	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	15,576	238	248.0	96.0%
Females	7,194	293	285.0	102.8%
Combined	**22,770**	**531**	**533.0**	**99.6%**

COMBINED HEALTHY	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	32,070	254	272.9	93.1%
Females	10,891	296	287.9	102.8%
Combined	**42,961**	**550**	**560.8**	**98.1%**

DISABLED	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	6,767	266	281.5	94.5%
Females	604	4	4.6	86.2%
Combined	**7,371**	**270**	**286.1**	**94.4%**

Recommendation

Summary of Experience versus Proposed Assumptions

- The currently assumed rates of mortality for healthy members are based on the 1994 Uninsured Pensioners (UP94) table, with assumed generational improvements. Recent experience is in very close agreement with assumed mortality rates for both males and females.
- Currently, a three year age set-forward is used for active members, and a two year set-forward is used for retired members. This means that rates of mortality for active members are slightly higher at each age than for retired members. One-quarter of deaths among active Police and Fire members are assumed to occur in the line of duty.
- Assumed mortality rates for disabled Police and Fire members are specified by a table developed in the previous experience study. Overall, actual mortality experience among these members has been in very close agreement with these rates.
- Mortality has tended to improve over the past century with advances in sanitation and healthcare. Future improvement may be expected. Accordingly, we recommend continued use of assumed generational mortality improvements.
- No changes in assumed mortality are recommended.

EFI

Teachers

Current Assumption

Summary of Experience versus Current Assumptions

ACTIVE	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	5,986	10	20.5	48.7%
Females	18,052	16	40.5	39.5%
Combined	**24,038**	**26**	**61.0**	**42.6%**

RETIREES & BENEFICIARIES	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	4,035	135	147.2	91.7%
Females	16,320	483	507.2	95.2%
Combined	**20,355**	**618**	**654.4**	**94.4%**

COMBINED HEALTHY	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	10,021	145	167.7	86.4%
Females	34,372	499	547.7	91.1%
Combined	**44,393**	**644**	**715.4**	**90.0%**

DISABLED	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	374	16	17.8	90.0%
Females	1,556	70	56.0	125.0%
Combined	**1,930**	**86**	**73.8**	**116.5%**

Recommendation

Summary of Experience versus Proposed Assumptions

ACTIVE	Eligible Exposure	Actual Deaths	Expected Deaths	Actual to Expected Ratio
Males	5,986	10	18.4	54.3%
Females	18,052	16	36.1	44.4%
Combined	**24,038**	**26**	**54.5**	**47.7%**

- The currently assumed rates of mortality for healthy members are based on the 1994 Uninsured Pensioners (UP94) table, with assumed generational improvements. Recent experience is within 10% of that assumed.
- Currently, a one year age set-forward is used for active members, and no set-forward is used for retired members.
- While there is not enough experience to warrant a change in assumed active mortality, it is reasonable to remove the set-forward, bringing active rates in line with retiree rates and actual experience slightly closer to that expected. No other changes are recommended.
- Assumed mortality rates for disabled Teachers are specified by a table developed in the previous experience study. Overall, actual mortality experience among these members has been in very close agreement with these rates.
- Mortality has tended to improve over the past century with advances in sanitation and healthcare. Future improvement may be expected. Accordingly, we recommend continued use of assumed generational mortality improvements.

EFI

Section 3: Economic Assumptions

Introduction

Economic assumptions utilized in the development of liabilities and costs for any defined benefit plan include:

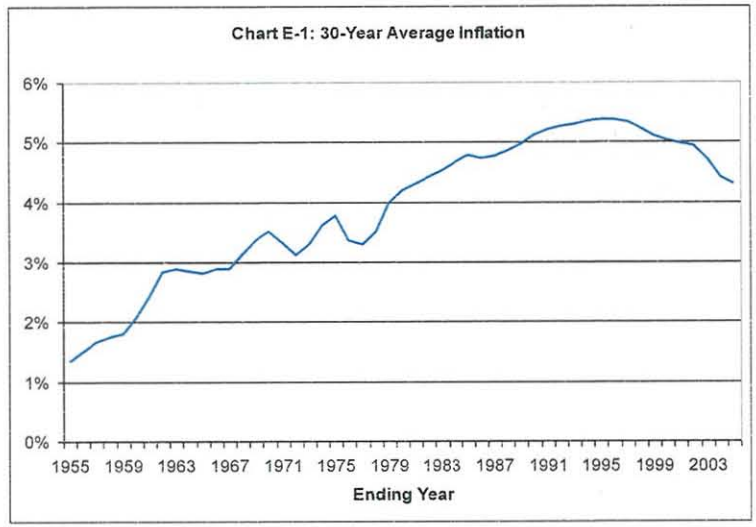
- The inflation assumption;
- The real investment return assumption; and
- The real growth in pay relative to inflation.

While we look to the past for indications of future economic behavior, we must also consider how the future may be expected to be different. In order to reflect the long-term nature of defined benefit plan funding in the development of these economic assumptions, it is appropriate to focus on long term trends. EFI selects 30-year periods of past experience as indications of such long-term trends.

Inflation

There are elements of the future economic environment that may differ from the past due to structural changes. An important and fundamental case in point is the rate of inflation, which underlies each of the three elements of economic assumptions listed above. While historical trends are not entirely indicative of the future, they do often serve as a useful guide in determination of assumptions.

Chart E-1 below shows the average rate of inflation over 30-year periods, with the earliest such period ending in 1955 and the latest ending in 2005. We note in the chart that inflation seemed to be increasing steadily until the 1990's when it leveled off and began to decrease. Yet, examination of Chart E-1 may lead to an assumption that inflation is likely to be in the range of 4% to 5% annually.



However, there are a number of reasons to believe that future inflation levels will not be as high as Chart E-1 would seem to suggest.

- An important reason for the high rate of inflation in the averages above is the nine-year period 1973-81 when inflation averaged 9.2% per year.
- The years 1973-81 featured unprecedented levels of household formation. The demand for new houses, cars, office space and equipment caused by the maturation of the

EFI

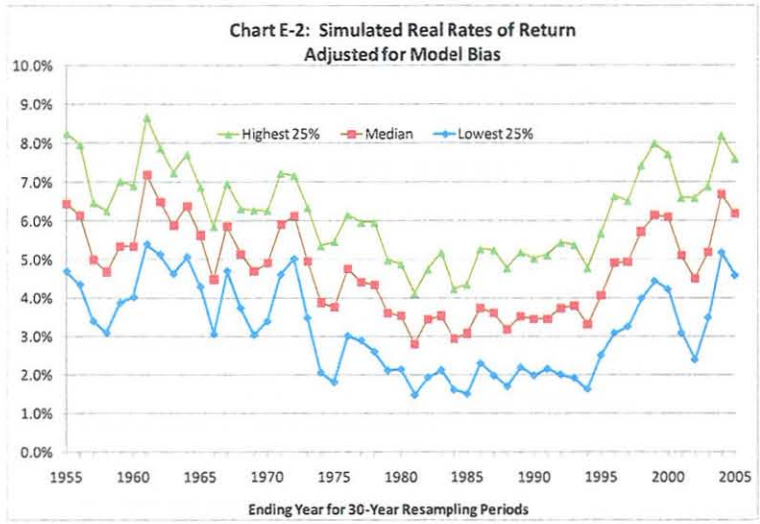
post-war baby boom may have largely been responsible for the inflation during these years. Since 1982, increases have been in the range 1.1% to 4.6% with one exception (6.1% in 1990), averaging 3.1% per year.

- The population of the United States is aging, which implies a greater likelihood of low inflation in the future. This has been observed in other countries with aging populations, such as Japan.
- Currently, the Federal Open Market Committee has policies in place to control inflation, making future levels more likely to remain relatively low.
- The Survey of Professional Forecasters, a quarterly publication of the Research Department of the Philadelphia Reserve Bank, indicates that national inflation levels are expected to be in the 2% to 4% range on average over the next ten years, with slightly higher levels in the near term.

Based on this analysis, we conclude that a reasonable range for future inflation is between 2.5% and 4.0% annually.

Investment Return

The investment return assumption depends on the anticipated average level of inflation and the anticipated average *real rate of return.* The real rate of return is the investment return in excess of underlying inflation. The expected average real rate of return is heavily dependent on asset mix: The portion of assets in stocks, bonds, and cash. A typical asset allocation is about 60% in equities and 40% in fixed income securities.



In Chart E-2 above, we have simulated the real return derived by a portfolio of approximately 60% equities and 40% fixed income. The simulated returns are derived by statistical re-sampling, using the following algorithm:

1. A contiguous 30-year period of historical market returns and inflation is selected as the re-sampling period.
2. For each simulation trial, 30 years of returns and inflation are selected randomly, with replacement, from the re-sampling period.
3. For each simulation trial, the average real rate of return is computed.
4. 500 simulation trials are computed for the re-sampling period. The median, top 25%, and bottom 25% rates of real return are determined.

EFI

For each 30-year re-sampling period ending in 1955 through 2005, the median, top 25%, and bottom 25% rates of real return are plotted on the graph.

We note in Chart E-2 that the median simulated real rate of return has historically been around 4.5% to 6.5% before dropping to around 3.5% for periods ending in the 1980s. The average median real return for all 30-year periods is 5.25%. Based on this data and the Funds' current asset allocation, we can determine a reasonable range of 3.5% to 6.5% with a best estimate range of 4.5% to 5.5%.

Plan Expenses

There are generally two types of expenses which are deducted annually from Plan assets: administrative expenses and investment expenses. Over the period of the experience study, these expenses averaged approximately $13 million per year, when combined. This represents on average about one-half of one percent of the asset value of the combined Funds. Thus, it is appropriate to assume that the total return will be decreased by this amount annually.

It is also expected that administrative expenses will increase in the future as administration will gradually shift away from the Treasury Department to DCRB. Therefore, a reasonable expense assumption is 0.75%, which can be reflected with a reduction in the assumed total return.

We noted above that a reasonable range for the inflation assumption is 2.5% to 4.0%. This translates into a best estimate range of assumed nominal rates of return of 7.0% (2.5% inflation plus 4.5% real return) to 9.5% (4.0% inflation plus 5.5% real return). This does not, however, consider plan expenses. Net of expenses, this range becomes 6.25% to 8.75%.

Payroll Growth

Components of the payroll growth assumptions include inflation, longevity and promotion increases, and other payroll increases not offset by salary reduction caused by replacement of terminating employees by new entrants. The latter is often attributed to productivity gains, or real wage inflation.

The inflationary component is currently the assumed annual CPI. Long range real wage inflation is assumed to be zero. Based on the history of negotiated wage increases for Plan participants, it is likely that Plan members can expect future pay increases to exceed inflation.

After review of past increases for Police, Fire, and Teachers, we found that over a period spanning more than two decades, increases have exceeded inflation by about 0.25% to 0.75% on average. Across the board increases have also been higher in recent years. This trend may not continue indefinitely; however, ongoing recruiting efforts seem to indicate that it will continue in the near future. Accordingly, we recommend a wage inflation assumption in the range 0.25% to 0.75% per year.

EFI

Assembling the building blocks of the economic assumptions, we have the following:

Assumption	Current Assumption	Recommended Range
Inflation	5.00%	2.50% to 4.00%
Real Wage Inflation	0.00%	0.25% to 0.75%
Real Return (net of expenses)	2.25%	3.75% to 4.75%

Examining the current assumptions, we see that they fall outside of the recommended ranges. Therefore, we propose a change in each of these assumptions to move toward the recommended ranges. This leaves a number of possible options, any of which would be deemed to be reasonable. Several of these options are shown below.

Assumption	Current	Alternate 1	Alternate 2	Alternate 3
Inflation	5.00%	3.00%	3.75%	4.00%
Real Wage Inflation	0.00%	0.25%	0.75%	0.50%
Real Return (net of expenses)	2.25%	4.00%	3.75%	4.50%
Wage Inflation	5.00%	3.25%	4.50%	4.50%
Total Return	7.25%	7.00%	7.50%	8.50%

If a significant change in economic assumptions is adopted, the Board could elect to implement a policy which phases in an assumption set gradually to avoid large fluctuations in contributions. For example, the assumed real rate of return could be increased by one-quarter of one percent annually.

EFI

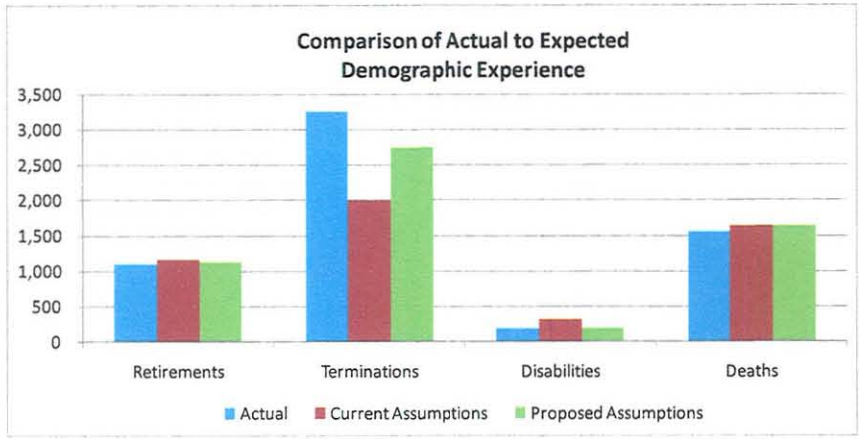
Conclusion

In this section, we look at a summary of experience. This will provide a sense of how well the current assumptions predicted experience in aggregate over the years studied. It will also give an indication as to how the assumption changes proposed within this study would have performed during the same time period.

Summary of Demographic Experience (All Groups)

			Current Assumptions		Proposed Assumptions	
Rate	Exposure	Actual	Expected	A/E Ratio	Expected	A/E Ratio
Retirement	4,778	1,094	1,156	94.6%	1,122	97.5%
Termination	36,638	3,252	1,997	162.8%	2,743	118.6%
Disability	20,215	178	316	56.3%	202	88.1%
Mortality*	96,655	1,550	1,636	94.7%	1,630	95.1%

The following chart shows the information above, while also demonstrating the relative magnitude of the decrements in comparison to each other. The bars in the chart represent the actual experience (number of retirements, etc.) versus what was expected based on current assumptions, and what *would have been expected* based on proposed assumptions.



* Healthy and disabled mortality combined