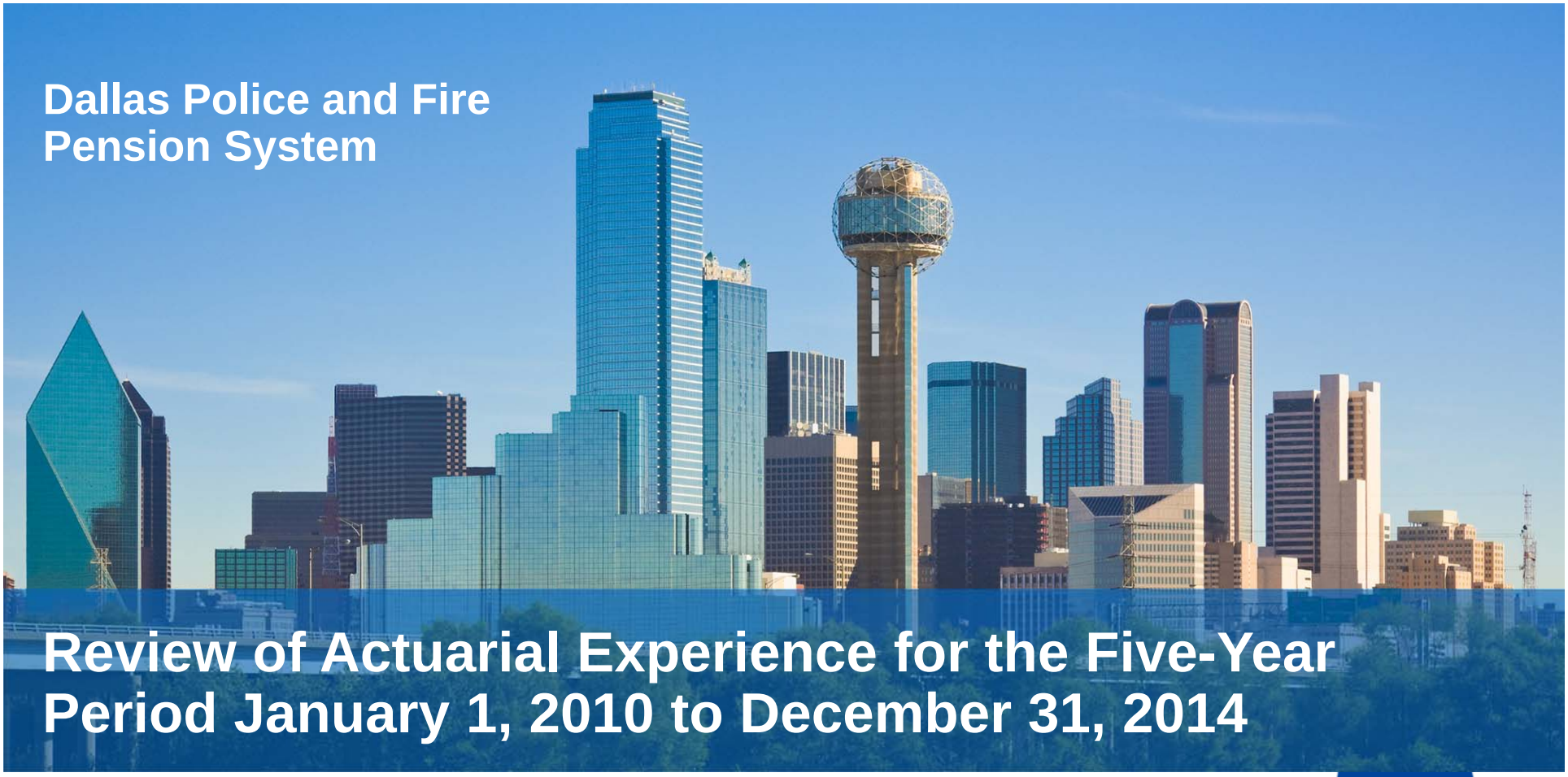

Dallas Police and Fire Pension System

Review of Actuarial Experience for the Five-Year Period January 1, 2010 to December 31, 2014

April 14, 2016

Presented by:

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Segal Consulting

Background
Why Conduct an Experience Study?

Purpose of Experience Study

- Review funding and asset methods
- Review recent experience and trends;
  compare against current actuarial assumptions and methods
- Develop information to establish recommended assumptions and methods for use in future valuations
- Avoid unnecessary contribution and accounting volatility
- Mitigate chances of inadequate funding
- Meet current industry standards
- Fiduciary responsibilities

Background
Two Types of Actuarial Assumptions

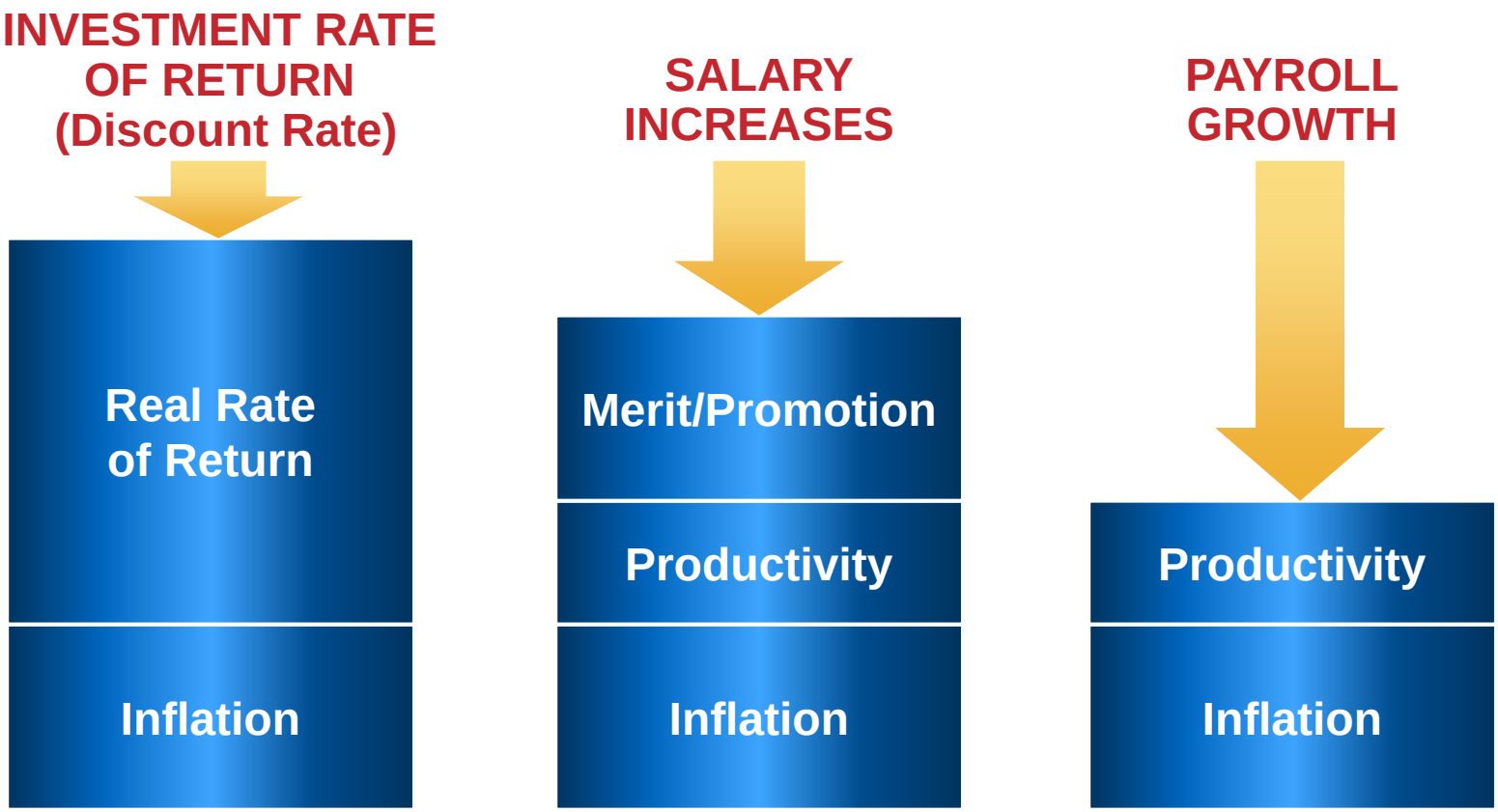
Economic	Demographic

• Inflation
• Discount rate (Investment rate of return)
• Payroll growth rate
• Salary increases
• COLA
• Administrative expenses
	• Death in active service
	• Death after retirement
	  – Non-disabled
	  – Disabled
	• Withdrawal
	• Disability
	• Retirement
	  – DROP Utilization
	• Percent Married/Spouse Age
	• Other Assumptions

Economic Assumptions

Economic Assumptions
Building Block Approach

Each economic assumption has two or three components (or building blocks).



Building blocks must be consistent across all economic assumptions.

Inflation Rate

- **Current Assumption: 2.75%**
- **Benchmarks:**

Average Annual Change in CPI-U	
Last 5 Years	1.62%
Last 10 Years	1.92%
Last 20 Years	2.22%
Last 30 Years	2.66%

  - Reasonable range based on NASRA survey and other public sector plans: 2.50% - 3.00%

- Recommendation: Maintain 2.75%

Investment Rate of Return

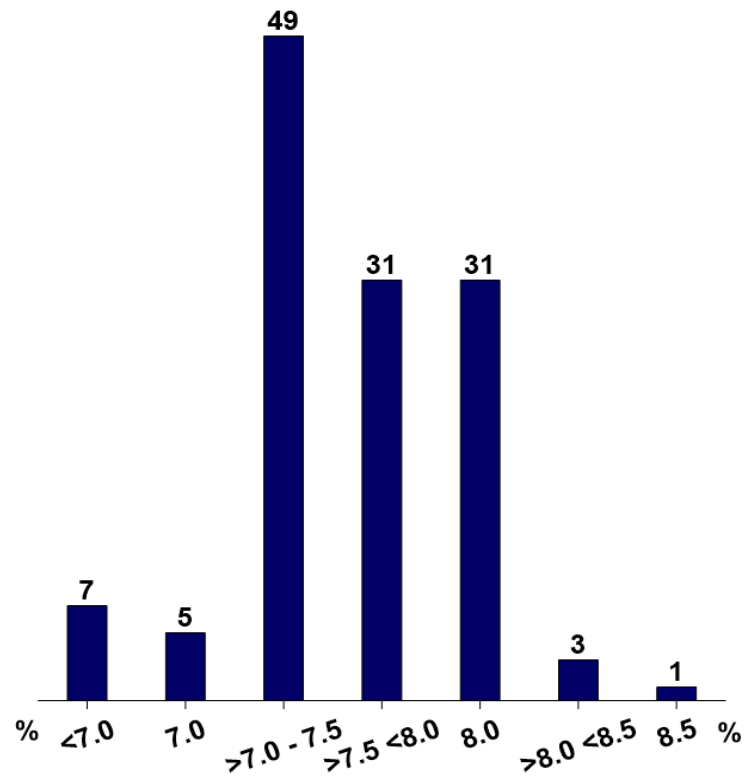
- **January 1, 2015 Valuation Assumption: 7.25%**
- **NASRA Survey, February 2016**
  - More than half of survey respondents lowered the assumption since 2008
  - The majority of plans (80 of the 127 plans measured) have assumptions greater than 7.00% but less than 8.00%. The average is 7.62%.
- We understand that the Board is addressing asset allocation and that this may take a few years to accomplish, possibly resulting in some short-term losses.
- Recommendation: Continue the 7.25% rate for long-term valuation purposes

Source: Compiled by NASRA based on Public Fund Survey, February 2016

NASRA Issue Brief: Public Pension Plan Investment Return Assumptions

Updated February 2016

FIGURE 5: DISTRIBUTION OF INVESTMENT RETURN ASSUMPTIONS



NASRA Public Fund Survey Feb 16

Salary Scale

Observations

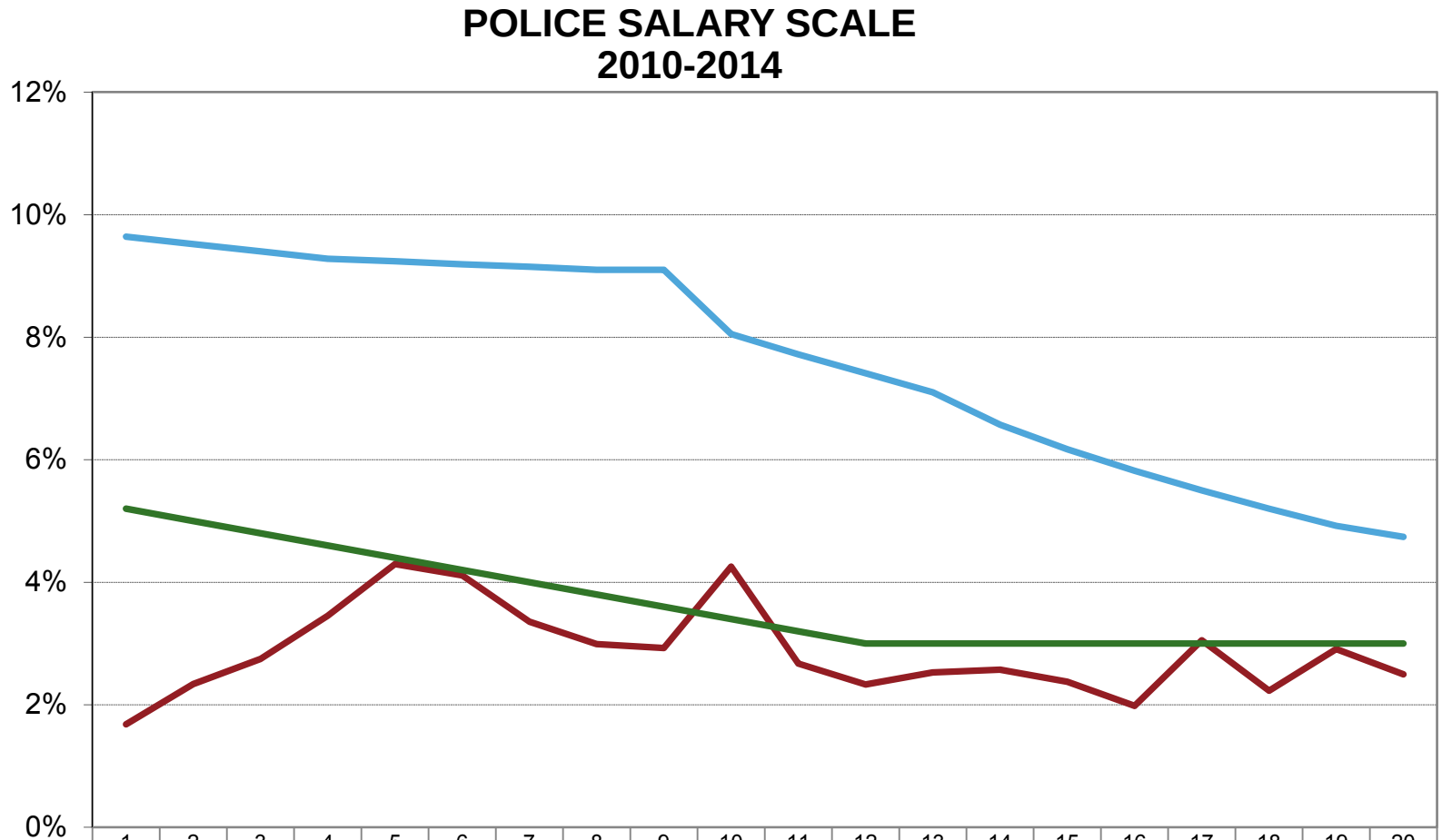
- The current assumption is a service-based table which was not modified when the Board adopted a 2.75% inflation assumption last year. The assumed scale is the same for Police and Fire.
- The Plan experience over the period was lower than assumed salary increases. This is consistent with lower than average CPI in this period (1.7% per year average).
- We also reviewed the current Meet and Confer agreement and took that into account in developing a new assumption.
- The Meet and Confer has essentially the same salary levels for Police and Fire for the various job classifications. But it appears that Fire employees have a slightly longer step period than Police. The actual experience during the study period also supports this observation.

Salary Scale

Recommendations

- Maintain a service-based table, but lower the rates to be consistent with the inflation assumption and the current Meet and Confer agreement
- Ultimate rate of 3.00%, rather than 4.00%
- Rates begin at 5.20% in the first year of employment
- Rates gradually decrease until the ultimate rate is reached
  - For Police the decrease is over 10 years
  - For Fire the decrease is over 15 years

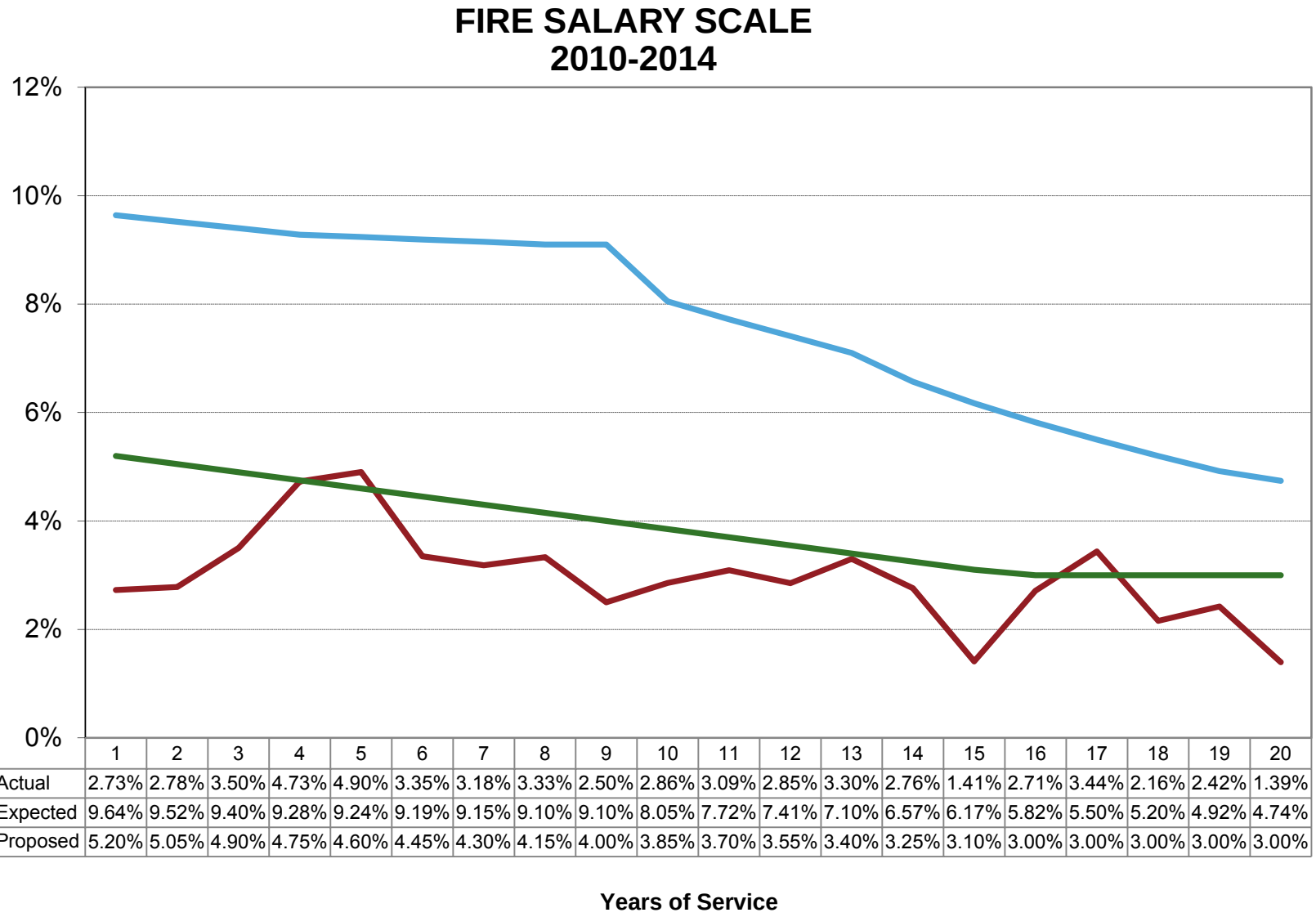
Salary Scale
Police



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Actual	1.68%	2.34%	2.75%	3.45%	4.30%	4.11%	3.36%	2.99%	2.93%	4.26%	2.67%	2.33%	2.53%	2.57%	2.38%	1.98%	3.05%	2.23%	2.91%	2.50%
Expected	9.64%	9.52%	9.40%	9.28%	9.24%	9.19%	9.15%	9.10%	9.10%	8.05%	7.72%	7.41%	7.10%	6.57%	6.17%	5.82%	5.50%	5.20%	4.92%	4.74%
Proposed	5.20%	5.00%	4.80%	4.60%	4.40%	4.20%	4.00%	3.80%	3.60%	3.40%	3.20%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%

Years of Service

Salary Scale
Fire



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Actual	2.73%	2.78%	3.50%	4.73%	4.90%	3.35%	3.18%	3.33%	2.50%	2.86%	3.09%	2.85%	3.30%	2.76%	1.41%	2.71%	3.44%	2.16%	2.42%	1.39%
Expected	9.64%	9.52%	9.40%	9.28%	9.24%	9.19%	9.15%	9.10%	9.10%	8.05%	7.72%	7.41%	7.10%	6.57%	6.17%	5.82%	5.50%	5.20%	4.92%	4.74%
Proposed	5.20%	5.05%	4.90%	4.75%	4.60%	4.45%	4.30%	4.15%	4.00%	3.85%	3.70%	3.55%	3.40%	3.25%	3.10%	3.00%	3.00%	3.00%	3.00%	3.00%

Payroll Growth

- **Current Assumption: 4.00%**
- **Comments**
  - Used to amortize Unfunded Actuarial Accrued Liability (UAAL) as a level percentage of payroll
  - Payment on UAAL expected to increase at payroll growth rate, all things considered
  - Used to develop the effective amortization period
  - Usually equivalent to inflation assumption or inflation plus productivity
  - Average payroll growth rate in the study period was 0.87%
- Recommendation: 2.75% to match the inflation assumption

Administrative Expenses

- **Current Assumption: Included as net of investment return**
- **Comments**
  - Current actuarial practice suggests establishing a separate explicit administrative expense assumption. (This is required for the GASB disclosures.)
  - In the most recent GASB disclosures an assumption of about $8 million was included for administrative expenses.
  - Based on discussions with System staff, expected expenses for the 2016 year are about $10 million.
- Recommendation: Adopt an explicit annual expense assumption of $10,000,000.
  - This will be reviewed annually.

Demographic Assumptions

Mortality Rates

Current Assumptions

- Healthy Life: RP-2000 Combined Healthy Table, projected ten years beyond the valuation date using Scale AA
- Disabled Life: RP-2000 Combined Healthy Table, set forward one year (no projection)

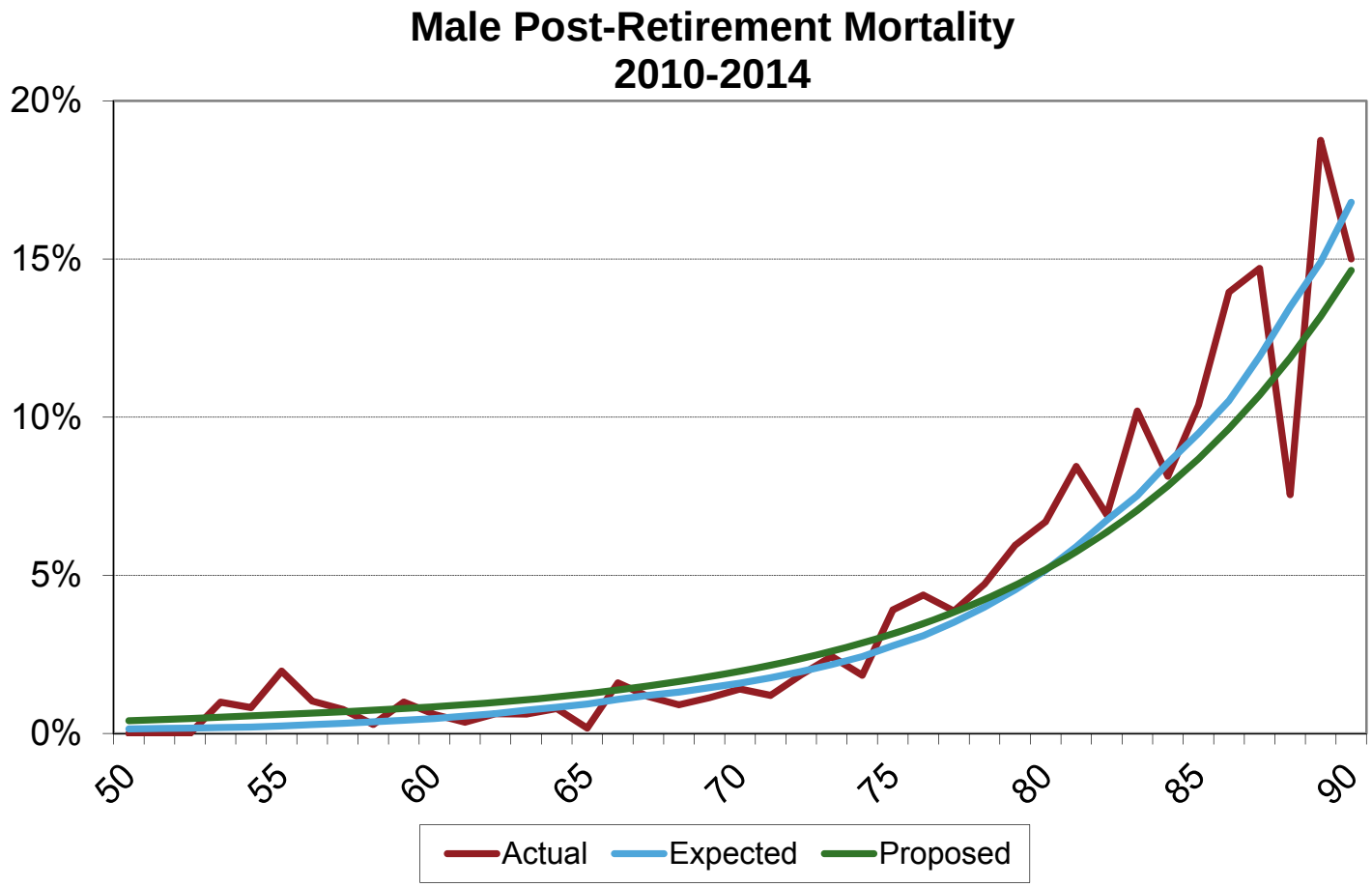
Findings

- Post-Retirement Mortality
  - Most important component of mortality assumptions; determines duration over which retirement benefits are paid
  - Examining all lives together (police and fire, retirees and beneficiaries) provides a more credible study population
  - Experience indicates rates of mortality higher than assumed
- Pre-Retirement Mortality – Actual deaths were below expectations, but there are small probabilities and low liabilities for pre-retirement death benefits
- Disabled Life Mortality
  - Should be in a consistent framework with healthy assumption
  - Exposure population not large enough to be credible, but the total count of actual deaths matched what was expected during the study period
- Demographers generally expect that mortality will continue to improve

Mortality Rates

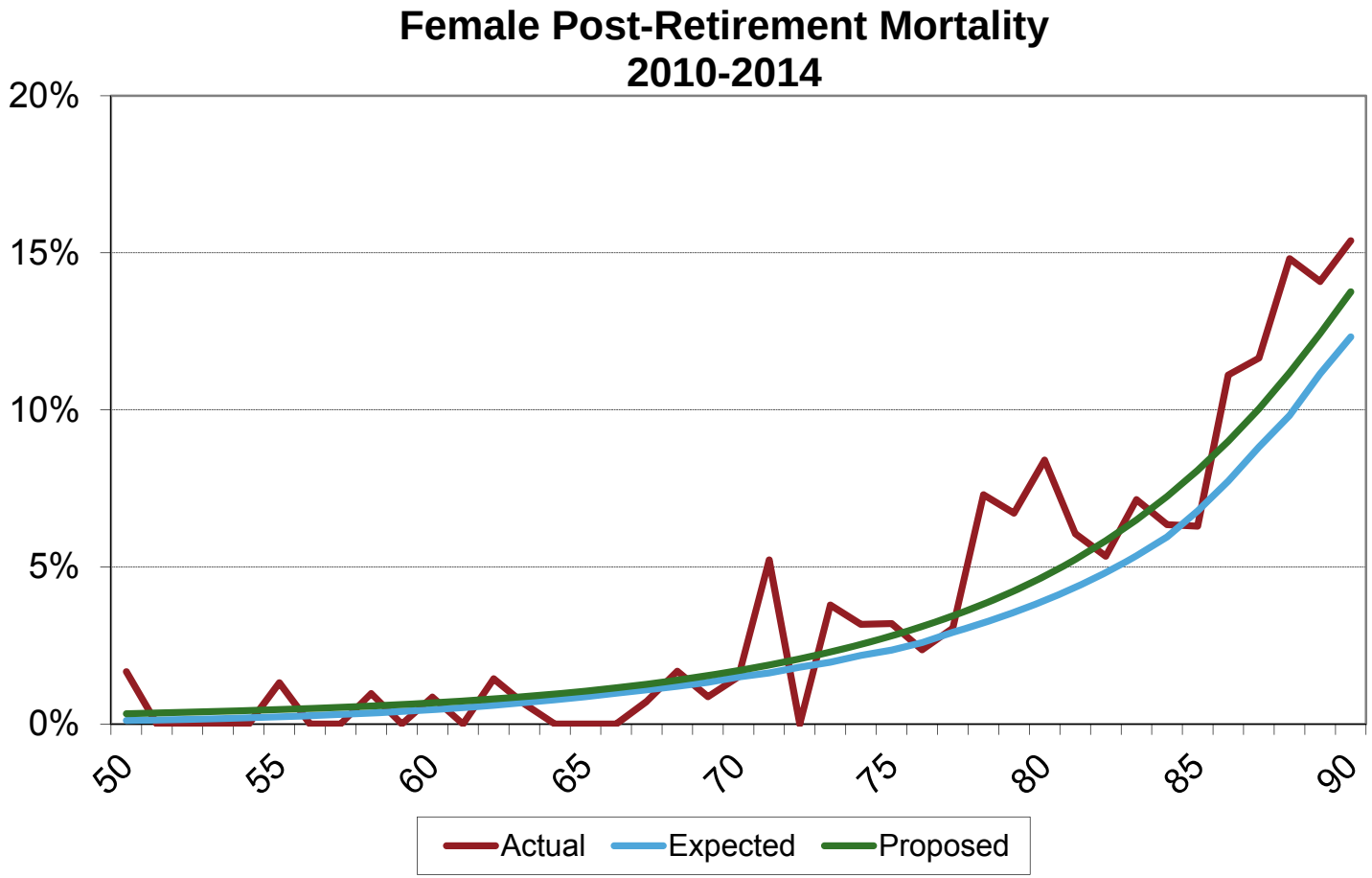
- The Society of Actuaries released updated mortality tables in 2014
  - Many actuaries around the country are updating their mortality assumptions to RP-2014
  - When plans are large enough, tables are adjusted to reflect actual experience
  - No public sector plans included in the analysis used to create the RP-2014 tables
  - SOA currently studying public sector mortality; new tables expected in 2017
- Recommendations
  - Post-Retirement Mortality
    - Update to sex-distinct RP-2014 Blue Collar Annuitant Mortality Tables, set back two years for males (no adjustment for females)
  - Pre-Retirement Mortality
    - Use sex-distinct RP-2014 Employee Mortality Tables, set forward two years for females (no adjustment for males)
  - Disabled Life Mortality
    - Use sex-distinct RP-2014 Disabled Retiree Tables, set back three years for males and females
  - Add generational projection using the MP-2015 improvement scale

Post-Retirement Mortality Rates
Males



- The current tables anticipated that 264.0 male annuitants ages 45-99 would die between 2010 and 2014.
- The actual number of deaths was 296.

Post-Retirement Mortality Rates
Females



- The current tables anticipated that 156.3 female annuitants ages 45-99 would die between 2010 and 2014.
- The actual number of deaths was 198.

Withdrawal Rates

Current Assumptions

- Current withdrawal rates are unisex and age-based
- Low rates for both groups (consistent with national trends)
- Police more likely to terminate employment prior to retirement than Fire

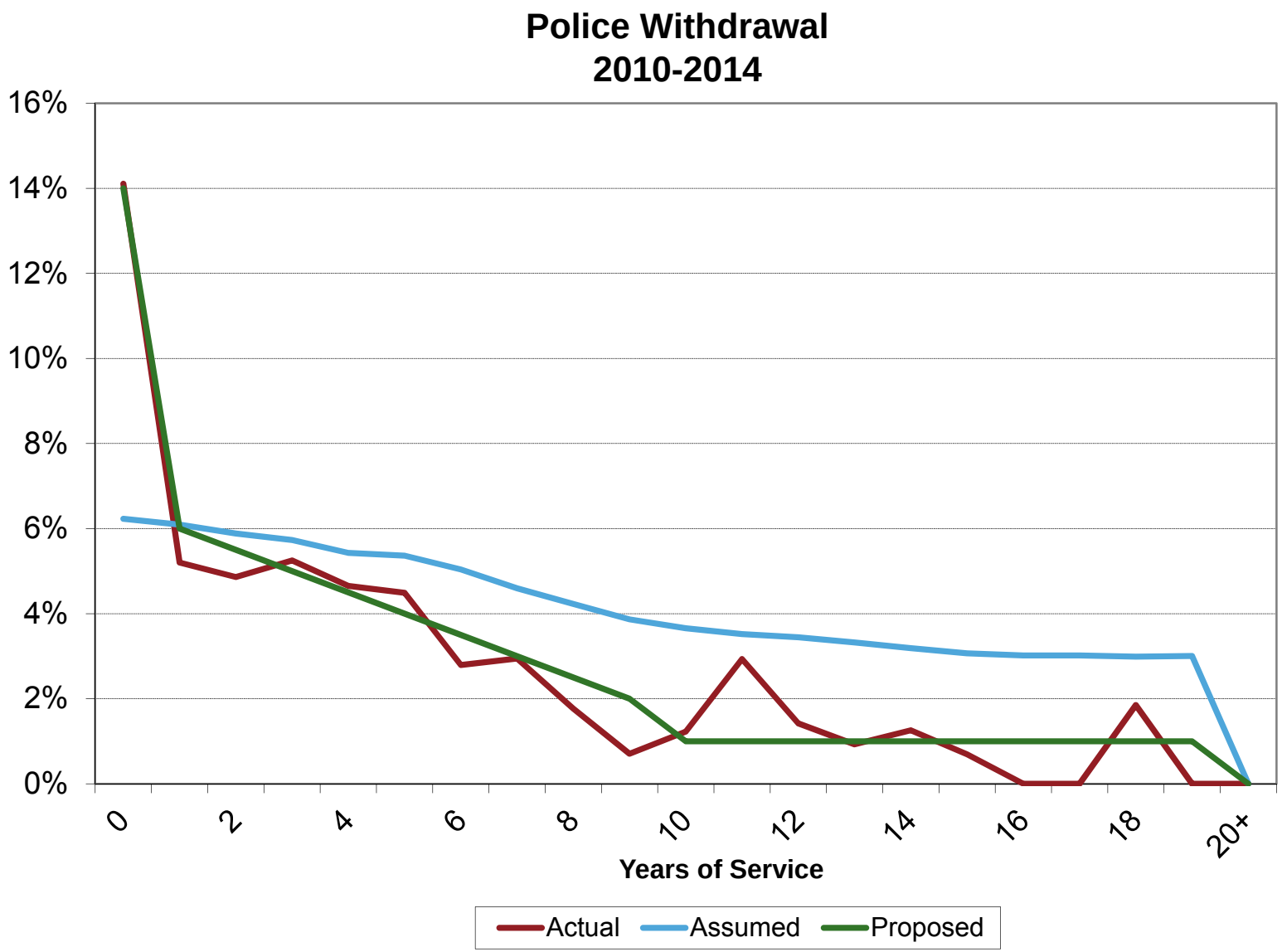
Findings

- The expected number of terminations was lower than expected for Police (447 vs. 522) and higher than expected for Fire overall (119 vs. 100). The Fire terminations were greater in early years of service, and lower after five years.
- The pattern of terminations was more closely related to service than age.

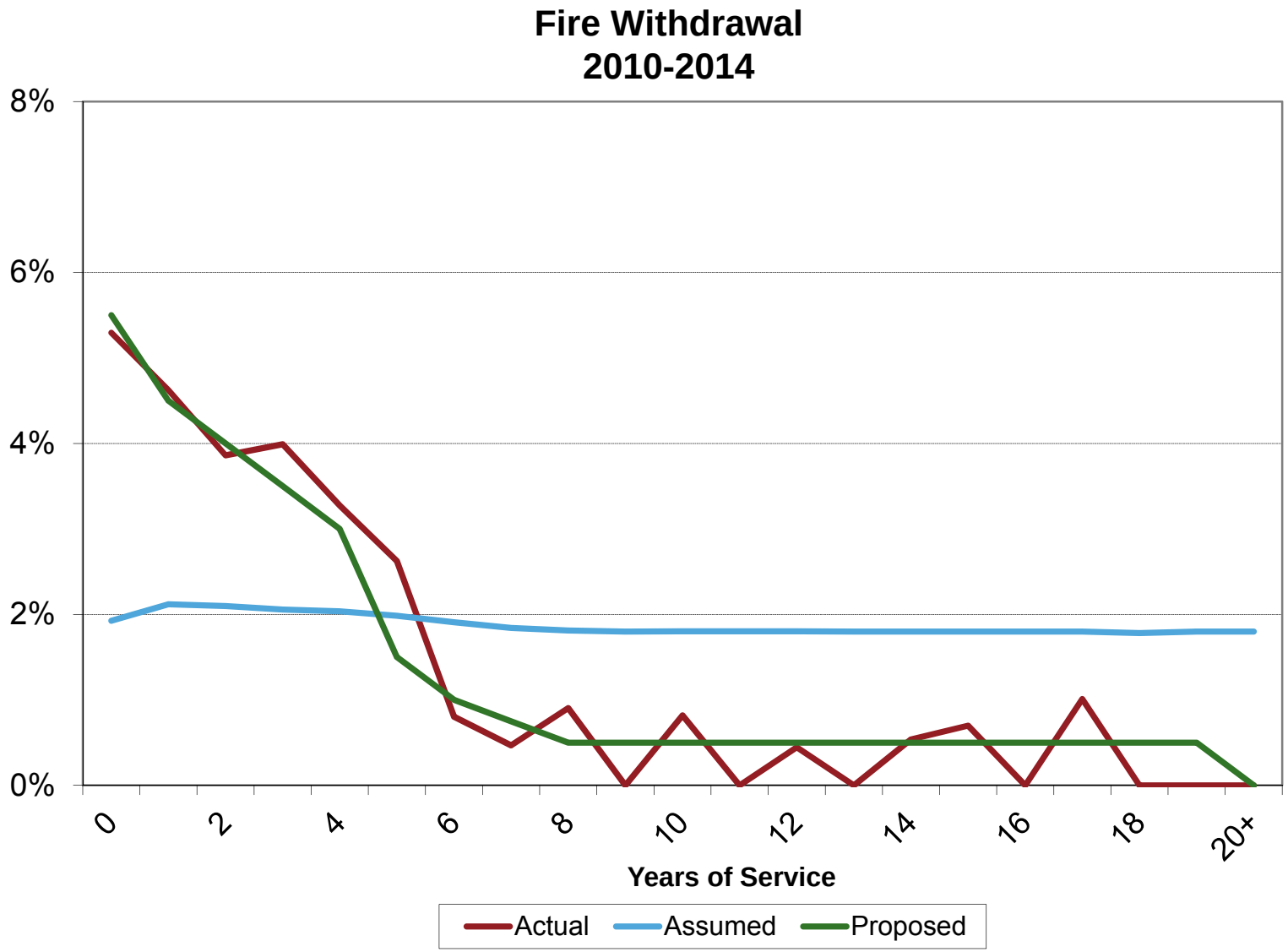
Recommendation:

- Change to service-based rates
- Modify rates for both groups to match the study experience

Withdrawal Rates
Police



Withdrawal Rates
Fire



Retirement Rates

Current Assumptions

- Age-related table of rates for eligible participants; the rate is when the plan participant ceases employment (not when they enter DROP).
- The rates begin at age 38 and are very low (less than 4% per year) until age 55; age 65 is the last age in the table.
- DROP Utilization:
  - Plan B members hired prior to 2/28/2011 are assumed to elect DROP at age 50 with at least 5 years of service
  - Plan B members hired after 2/28/2011 are assumed to elect DROP at age 55 with 10 years of service
  - Active members who satisfy the above criteria and have not entered DROP are assumed to never do so.
  - Active members who retire with a DROP account are assumed to receive their account over a 10-year period

Retirement Rates

Findings

- The total number of retirements was about 6% less than assumed for Police (472 vs. 501) and 27% less for Fire (287 vs. 418)
- The number of retirements less than age 50 was significantly less than assumed for both groups (33 vs. 63 for Police and 9 vs. 27 for Fire).
- 95% of eligible Police have opted for DROP. For Fire the percentage was 98%.
- For those retiring in the study period, Police had an average retirement age of 56.7 with an average DROP period of 7.5 years. For Fire the average age was 58.7 with an average DROP service of 9.1 years.
- The data indicate that Police and Fire enter DROP about the same age but then Fire members remain on the job up to 2 years longer.
- The proposed rates for retirement reflect these observed differences.

Recommendation:

- Modify rates for both groups to match the study experience
- No changes to DROP entry assumption

Retirement Rates
Recommendations

Age	Current Police Rates	Proposed Police Rates	Current Fire Rates	Proposed Fire Rates
49 or less	2.00%	1.00%	2.00%	0.75%
50	4.00%	3.00%	4.00%	2.50%
51	3.00%	3.00%	3.00%	2.50%
52	3.00%	3.00%	3.00%	2.50%
53	3.00%	7.00%	3.00%	2.50%
54	3.00%	7.00%	3.00%	2.50%
55	25.00%	15.00%	25.00%	12.00%
56	20.00%	20.00%	20.00%	12.00%
57	20.00%	20.00%	20.00%	12.00%
58	20.00%	25.00%	20.00%	12.00%
59	20.00%	25.00%	20.00%	25.00%
60	20.00%	25.00%	20.00%	25.00%
61	20.00%	25.00%	20.00%	25.00%
62	20.00%	25.00%	20.00%	25.00%
63	20.00%	25.00%	20.00%	25.00%
64	20.00%	25.00%	20.00%	25.00%
65	100.00%	50.00%	100.00%	30.00%
66	100.00%	50.00%	100.00%	30.00%
67	100.00%	100.00%	100.00%	100.00%

DROP Utilization:

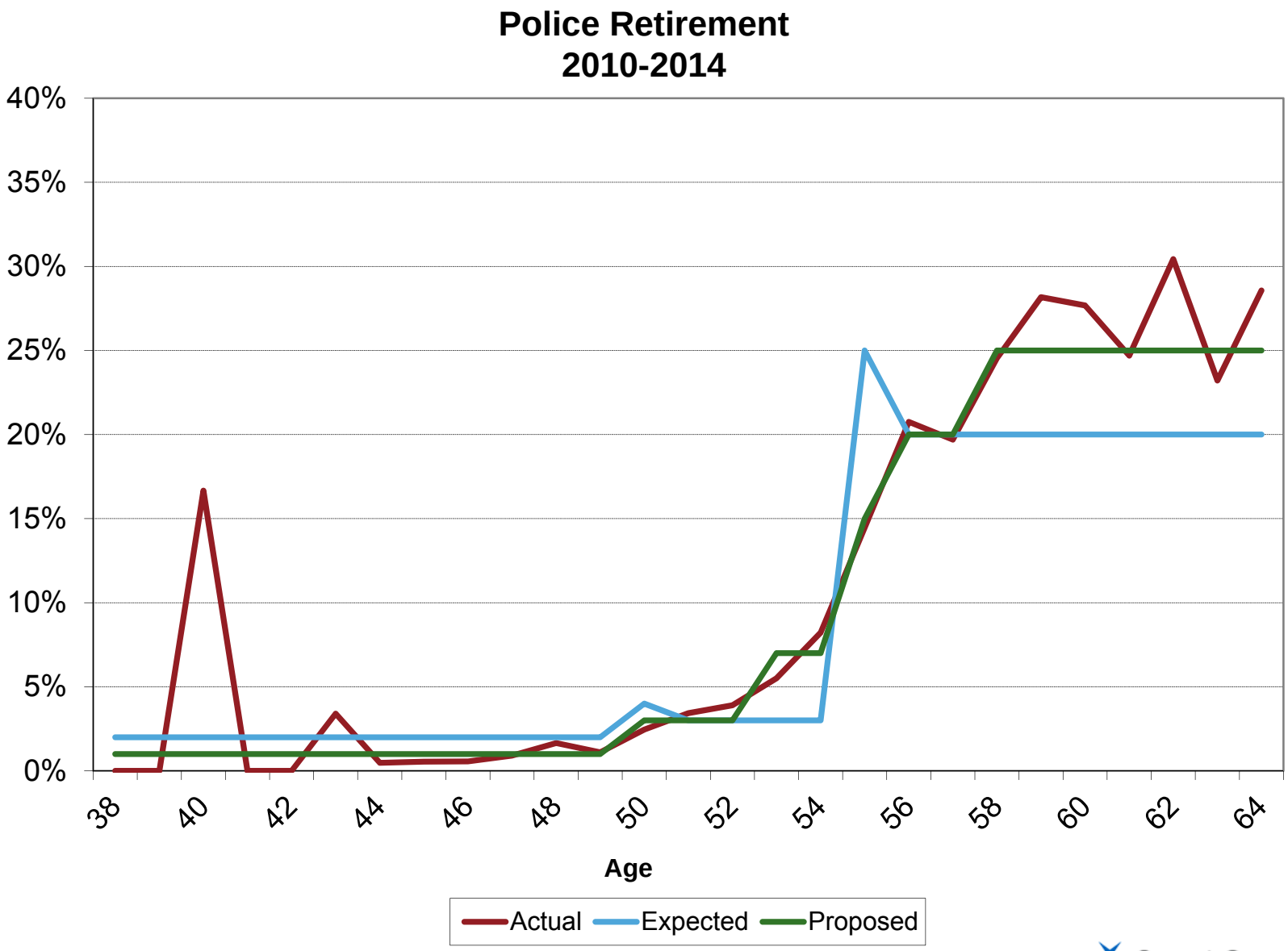
Plan B members hired prior to 2/28/2011 are assumed to elect DROP at age 50 with at least 5 years of service

Plan B members hired after 2/28/2011 are assumed to elect DROP at age 55 with 10 years of service

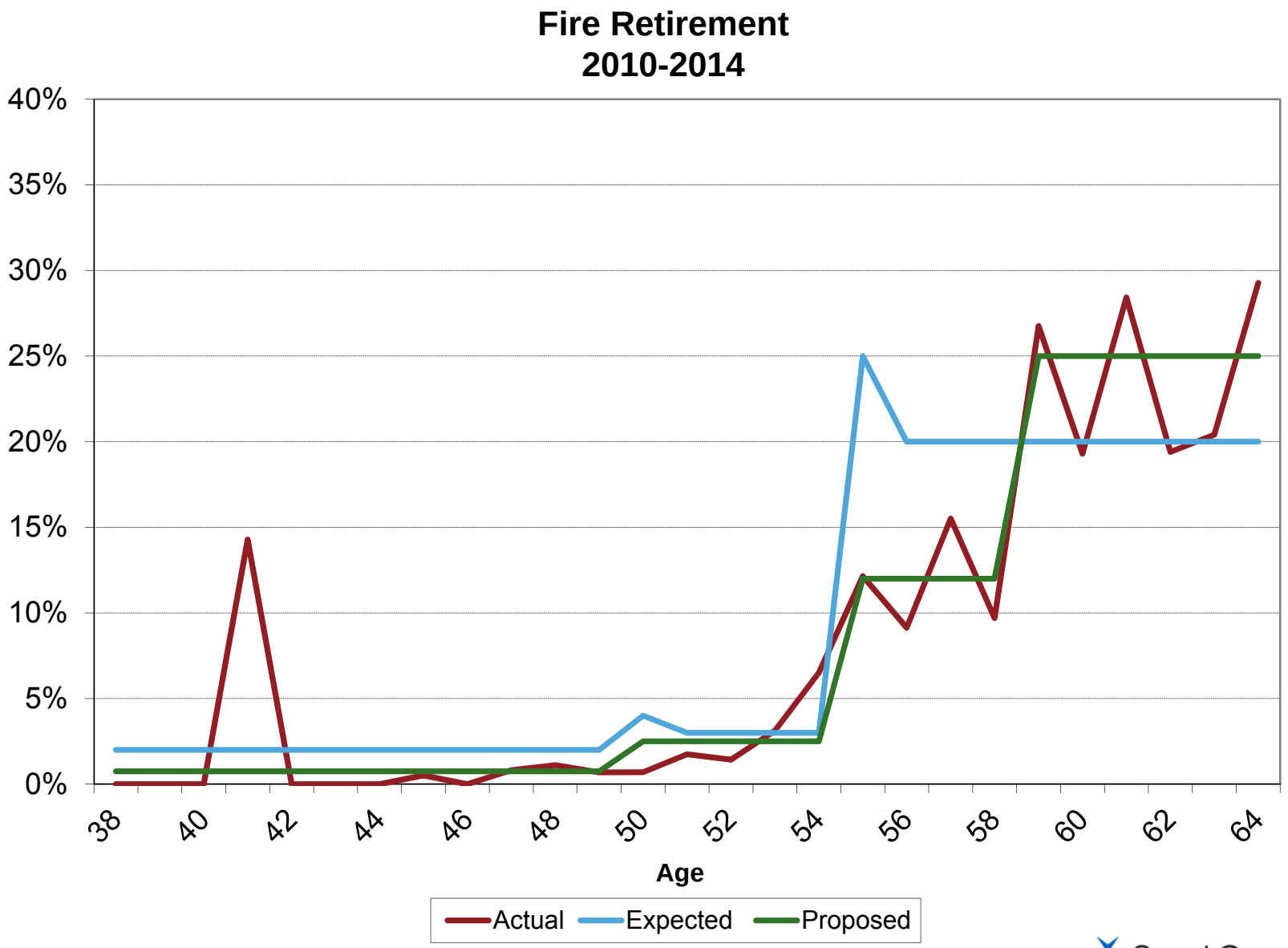
Active members who satisfy the above criteria and have not entered DROP are assumed to never do so.

Active members who retire with a DROP account are assumed to receive their account over a 10-year period

Retirement Rates
Police



Retirement Rates
Fire



Disability Rates

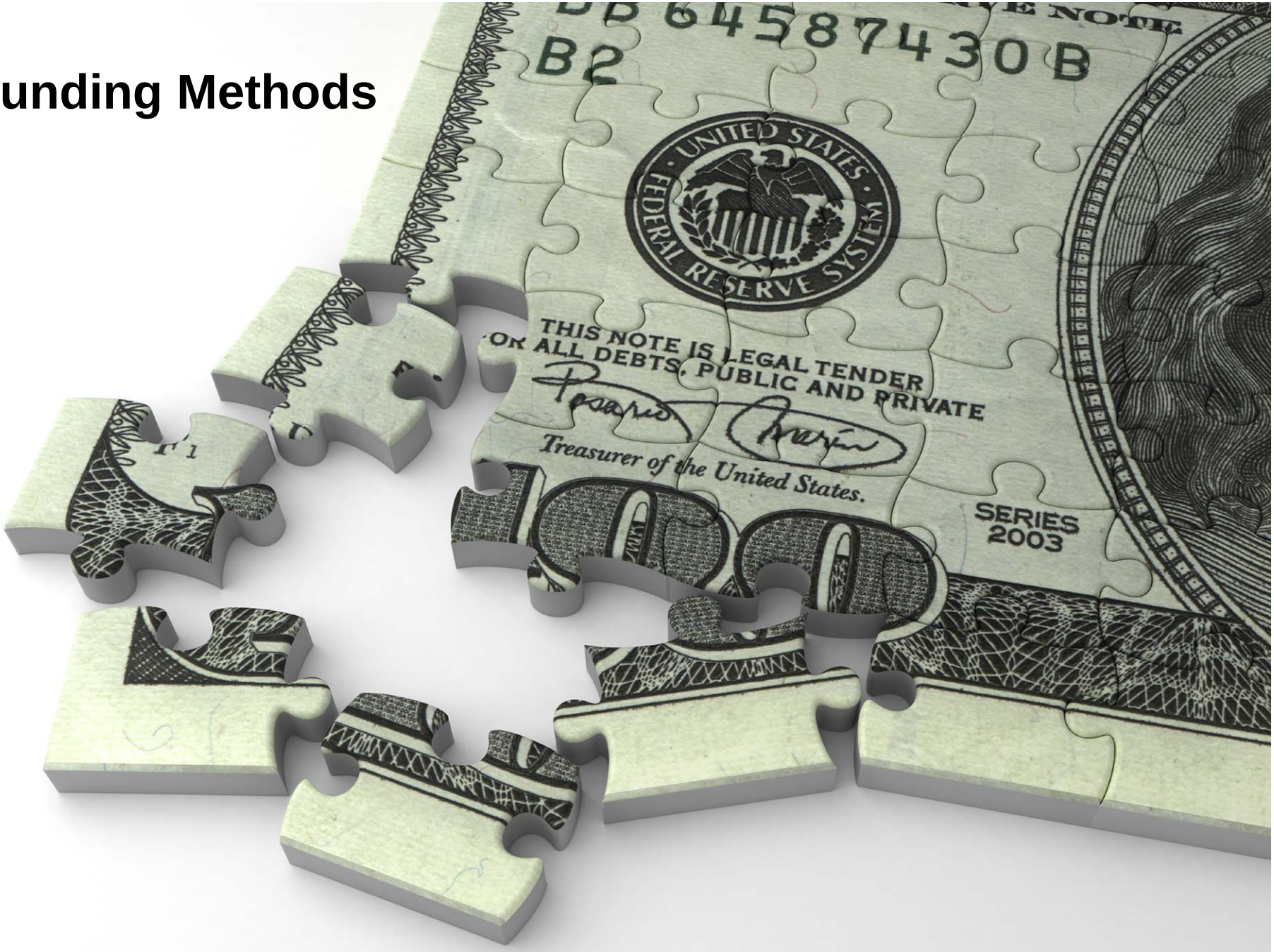
- Findings
  - There were only three Police disabilities and one Fire disability during the study period.
  - Even with low assumed rates, these are about 1/3 of expected for Police and 1/7 of expected for Fire
- Recommendation:
  - Change to rates shown below

Age	Current Police Rates	Proposed Police Rates	Current Fire Rates	Proposed Fire Rates
20	0.035%	0.010%	0.070%	0.010%
25	0.037%	0.015%	0.075%	0.015%
30	0.042%	0.020%	0.084%	0.020%
35	0.048%	0.025%	0.096%	0.025%
40	0.057%	0.030%	0.115%	0.030%
45	0.079%	0.035%	0.158%	0.035%

Other Demographic Assumptions

- Marriage Rates and Spousal Age Difference
  - The current assumption is that 80% of active members are married with a three year age differential between the spouses.
  - During the study period, 76% of those retired with a spousal continuance benefit.
  - We recommend reducing the marriage assumption to 75%, but maintaining the three-year age differential.
- Overtime Load for City Contributions
  - City contributions are based on total pay, including overtime and non-computation pay. Currently this is assumed to be 11% greater than computation pay.
  - In the most recent financial audit, City contributions were about 16% greater than what would have been anticipated using computation pay.
  - Until further analysis of the City contribution determination is completed, we recommend that the 11% load be continued.
- Other Plan Requirements
  - DROP interest is scheduled to be 7% until September 30, 2016 when it will decrease to 6% on October 1 and then to 5% one year later.
  - A simple COLA of 4% per year is included for members hired prior to December 31, 2006.

Funding Methods



Actuarial Cost Method

- Current Method is Entry Age Normal
  - Most common method used for public sector plans in the U.S. (about 70% of all plans)
  - Normal cost stays constant as a percentage of payroll for each member
  - The method uses the assumed salary scale to develop the normal cost
- Recommendation:
  - Maintain current method, except modify it slightly to recognize the individual normal cost for each active member rather than using a three-tier blended approach.

Entry Age Normal is the required method under the new GASB accounting statements. While not mandated, the use of one method for funding and accounting may aid in communicating results.

Actuarial Asset Smoothing Method

- Current Method
  - Reflects 10-year smoothed value of assets
  - 20% Corridor around market
- Recommendation:
  - Change the method from 10-year smoothing to 5-year smoothing.
  - This can be implemented retroactively or prospectively.
  - Implementing retroactively lowers the actuarial value of assets from 120.0% of market to 113.9% of market effective January 1, 2015.
  - Implementing prospectively resets the actuarial asset value to 100.0% of market.

Amortization of the Unfunded Actuarial Accrued Liability

- The effective amortization period will be developed using a level % of payroll with payroll increasing 2.75% per year.
- Currently the net effective amortization is infinite.
- Segal's valuation reports will show contribution requirements based on 30-year and 40-year amortization of the unfunded liability.

The Texas Pension Review Board (PRB) targets an amortization period of 30 years but not more than 40 years. Systems with an effective amortization period greater than 40 years for three consecutive years need to develop a Funding Soundness Restoration Plan (FSRP) to bring them into compliance over a reasonable period of time. For Dallas Police and Fire, it is our understanding that the first FSRP will be due to the PRB no later than November 1, 2017.

Impact of Proposed Assumption Changes on Normal Cost, Actuarial Accrued Liability and Funding Ratio

The following chart provides the estimated impact of the assumption changes, based on the January 1, 2015 valuation results for the main plan.

	Current Plan	Mortality	Retirement	Turnover	Disability	Percent Married	Salary Scale
% Change in NC	N/A	1.94%	-0.87%	3.82%	-0.57%	-0.28%	-23.69%
Change in NC as a % of Computation Pay	N/A	0.52%	-0.24%	1.04%	-0.16%	-0.08%	-6.61%
Active AAL% change	N/A	2.01%	-1.16%	-0.42%	0.17%	-0.22%	2.06%
Inactive AAL% change	N/A	2.78%	0.00%	0.00%	0.00%	0.00%	0.00%
Funding Ratio AVA	64.75%	63.49%	63.81%	63.92%	63.87%	63.93%	63.38%
Funding Ratio MVA	53.96%	52.91%	53.17%	53.27%	53.23%	53.28%	52.81%

Note: Computation pay is used to develop benefit liabilities and employee contributions. City contributions of 27.5% are based on computation pay plus overtime and other non-computation pay. This additional pay is assumed to be 11% on top of computational pay.

The Current Plan column above are results as of January 1, 2015 produced by Segal. The corresponding Funding Ratio from the prior actuary's valuation was 63.80% on an actuarial value of assets basis and 53.16% on a market value basis.

Impact of Proposed Assumption Changes on Total Contribution Rates

The following chart provides the estimated impact of the assumption changes, based on the January 1, 2015 valuation results for the main plan.

The contribution rates shown are total rates, and are not net of expected member contributions.

	Current Plan	Mortality	Retirement	Turnover	Disability	Percent Married	Salary Scale (including Payroll Growth)	Include $10 million Admin. Expenses
30-year contribution rate as a % of Computation Pay	54.17%	56.23%	55.60%	56.49%	56.39%	56.24%	54.77%	57.48%
40-year contribution rate as a % of Computation Pay	50.10%	51.93%	51.36%	52.28%	52.17%	52.03%	50.84%	53.54%
Deficit as a % of Computation Pay (30-Year)	-16.75%	-18.81%	-18.18%	-19.07%	-18.97%	-18.82%	-17.35%	-20.06%
Deficit as a % of Computation Pay (40-Year)	-12.68%	-14.51%	-13.94%	-14.86%	-14.75%	-14.61%	-13.42%	-16.12%

Note: Employee contributions of 8.50% for non-DROP participants and 4.00% for DROP participants are based on Computation pay. City contributions of 27.5% are based on computation pay plus overtime and other non-computation pay. This additional pay is assumed to be 11% on top of computational pay. The above %'s reflect a blending of these rates for comparison purposes.

Impact of Proposed Method Changes

	Current Plan with Assumption Changes	Retroactive Five-Year Asset Smoothing	Reset Assets to Market as of January 2015 ($3.1 Billion)	Estimated January 2016 Market Value of $2.7 Billion
30-year contribution rate as a % of Computation Pay	57.48%	60.42%	67.13%	72.97%
40-year contribution rate as a % of Computation Pay	53.54%	56.14%	62.06%	67.22%
30-year contribution rate as a % of Computation Pay plus Overtime	51.78%	54.43%	60.48%	65.74%
40-year contribution rate as a % of Computation Pay plus Overtime	48.23%	50.58%	55.91%	60.56%
Funded Ratio AVA	63.38%	60.16%	52.81%	46.43%
Funded Ratio MVA	52.81%	52.81%	52.81%	46.43%

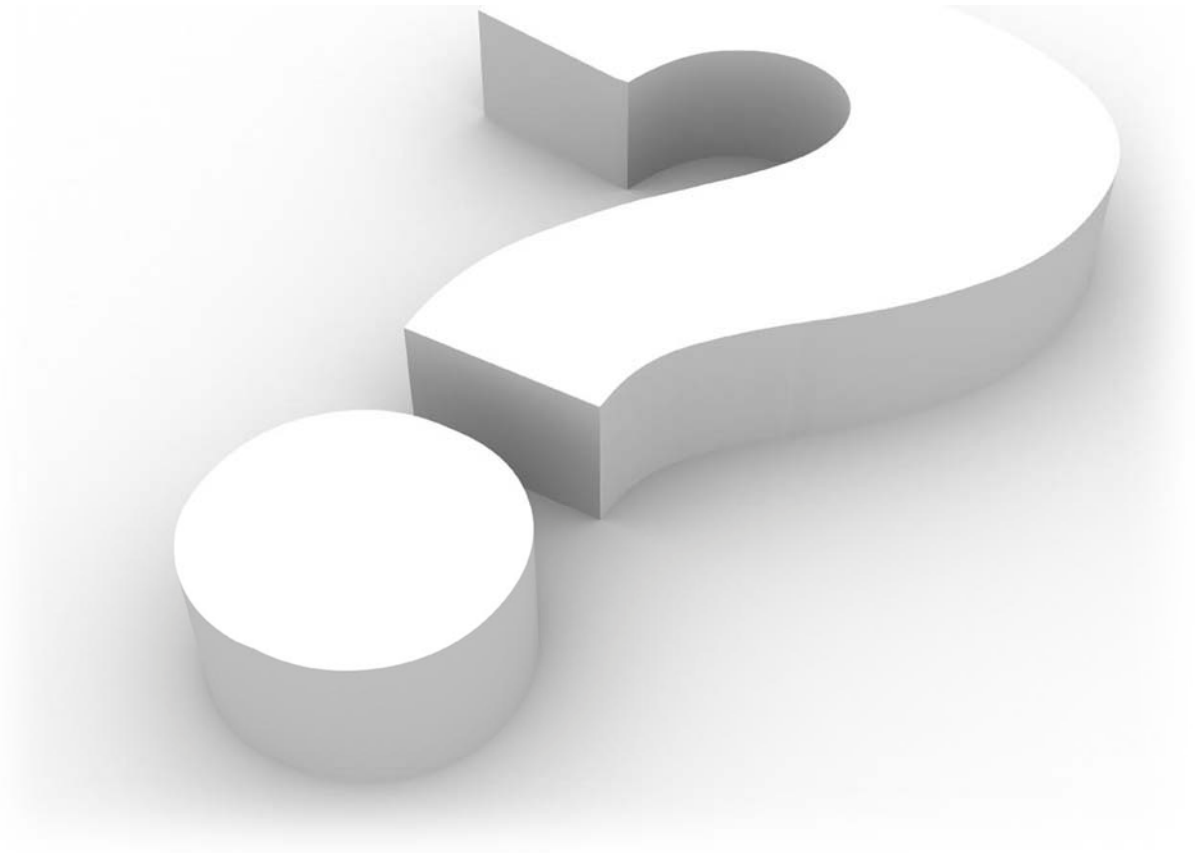
Note: Employee contributions of 8.50% for non-DROP participants and 4.00% for DROP participants are based on Computation pay. City contributions of 27.5% are based on computation pay plus overtime and other non-computation pay. This additional pay is assumed to be 11% on top of computational pay. The above %'s reflect a blending of these rates for comparison purposes.

Impact of Proposed Method Changes

	Current Plan with Assumption Changes	Retroactive Five-Year Asset Smoothing	Reset Assets to Market as of January 2015 ($3.1 Billion)	Estimated January 2016 Market Value of $2.7 Billion
Deficit as a % of Computation Pay (30-Year)	-20.06%	-23.00%	-29.71%	-35.55%
Deficit as a % of Computation Pay (40-Year)	-16.12%	-18.72%	-24.64%	-29.80%
Deficit as a % of Computation Pay plus Overtime (30-Year)	-18.07%	-20.72%	-26.77%	-32.03%
Deficit as a % of Computation Pay plus Overtime (40-Year)	-14.52%	-16.86%	-22.20%	-26.85%
Funded Ratio AVA	63.38%	60.16%	52.81%	46.43%
Funded Ratio MVA	52.81%	52.81%	52.81%	46.43%

Note: Employee contributions of 8.50% for non-DROP participants and 4.00% for DROP participants are based on Computation pay. City contributions of 27.5% are based on computation pay plus overtime and other non-computation pay. This additional pay is assumed to be 11% on top of computational pay. The above %'s reflect a blending of these rates for comparison purposes.

Questions and Discussion



Thank You!

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