



El Paso City Employees' Pension Fund

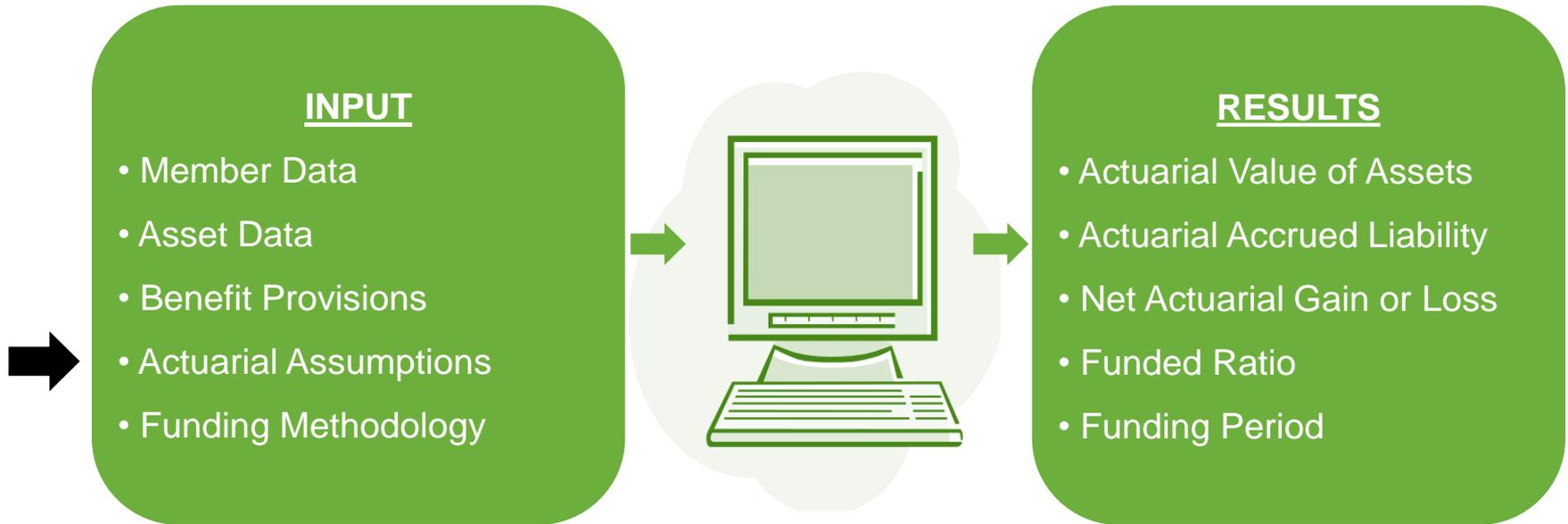
Investigation of Demographic and Economic Experience
Four-Year Period from September 1, 2010 – August 31, 2014

Board of Trustees Meeting
September, 2016

Agenda

- Experience Review Process
- Review of Demographic Assumptions
- Review of Economic Assumptions
- Cost Impact of Proposed Assumptions and Method Changes

The Valuation Process



Contributions are set by statute. The health of the Fund is determined by the actuarial valuation based upon estimated investment return, benefits and expenses using assumptions and methods recommended by the actuary and adopted by the Board. Over the long term, contributions may need to be adjusted to reflect actual investment return, benefits and expenses.

Actuarial Assumptions



- Actuarial assumptions bridge the gap between the information that we know with reasonable certainty as of the valuation date – age, gender, service, pay or benefits of the members – and what may happen in the future.
- The actuarial assumptions of the El Paso City Employees’ Pension Fund are reviewed periodically in a process known as an Experience Review.
 - The last experience review was prepared as of August 31, 2010.
 - Usually performed every six years due to bi-annual valuations. This study based on four years due to new legislation that requires studies be done no longer than five years apart.
 - The results of this review will be used with the September 1, 2016 valuation.
- Detailed summaries of current actuarial assumptions are provided in the most recent actuarial valuation reports prepared for this system.

Actuarial Assumptions – 9/1/2014 Valuation

- **Demographic**

- Mortality
 - Based on RP-2000 mortality tables set forward 2 years
 - Projected improvements to 2017 based on Scale AA
- Service Retirement
 - Varies by age and gender, and employee group
- Disability
 - Varies by age and gender
- Termination
 - Varies by age
 - Varies by service prior to two years of service
- Overtime Load (2.00%)

- **Economic**

- Rate of Return (7.50%)
- Inflation (3.50%)
- Pay Increases:

<u>Years of Service</u>	<u>Annual Increase</u>
0	5.70%
5	5.45%
10	5.20%
15	4.85%
20	4.20%
25+	4.00%

This is a summary of the assumptions currently used in the actuarial valuation.

Assumptions are generally split into two broad categories – demographic assumptions and economic assumptions. Demographic assumptions are assumptions related to people, while economic assumptions relate to money.

Experience Review Process

- Based on Four-Year Experience Review for Period September 1, 2010 – August 31, 2014
- Consider trends observed during the previous Experience Review
- Compare Experience (“Actual”) with Assumptions (“Expected”)
- Make Judgments About Future Trends:
 - Plan-Specific Experience vs. National Trends
 - Long-Term vs. Short-Term Factors
- Recommend changes in assumptions as needed
- Implement effective with the September 1, 2016 Actuarial Valuation
- For full sets of rates see corresponding reports

“Enhancing Reliability of Actuarial Valuations for Pension Plans” by the GFOA

Engage the actuary to perform additional services to validate the actuarial assumptions used for the valuation. Such services include...Actuarial Experience Study. An actuarial experience study reviews the differences between a plan's assumed and actual experience over multiple years (typically 3 to 5), with the goal of examining the trends related to actual experience and recommending changes to assumptions, if needed.



Demographic Assumptions

Post-Retirement and Active Mortality

Retirement

Termination

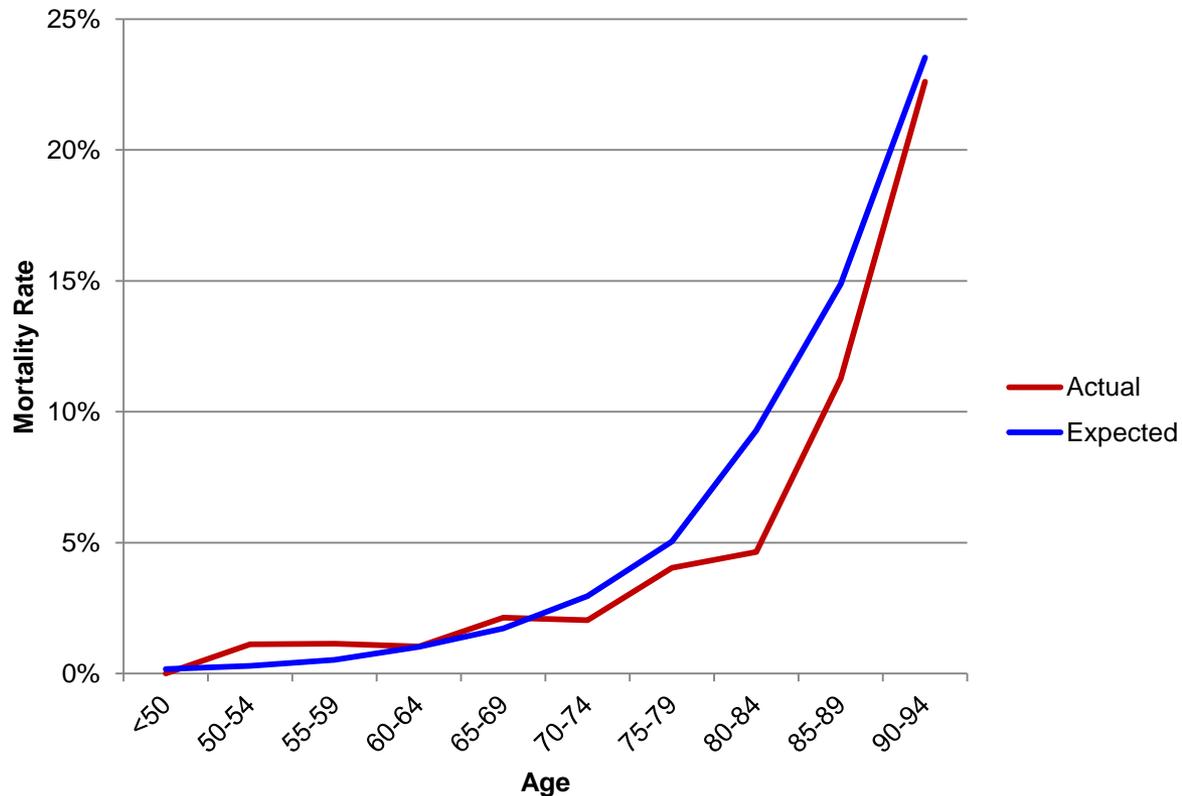
Disability

Overtime

Mortality Rates - Considerations

- Mortality tables vary by age, gender, employee group and health status
- Current mortality rates
 - Based on RP-2000 mortality tables released in 2003
 - Adjusted to Fund population based on results of August 31, 2010 experience study
 - Includes provision to reflect future mortality improvements based on mortality projection Scale AA
- Recent studies of the U.S. Population have determined that overall rates of mortality have decreased faster than predicted by Scale AA
 - Project that longevity will continue to improve
 - Society of Actuaries released new mortality tables to reflect improved base mortality rates (RP-2014) and mortality improvement rates (Scale BB, MP-2014 and MP-2015)
- In most age groups, the experience review showed actual observed mortality rates significantly lower than expected mortality rates based on current tables

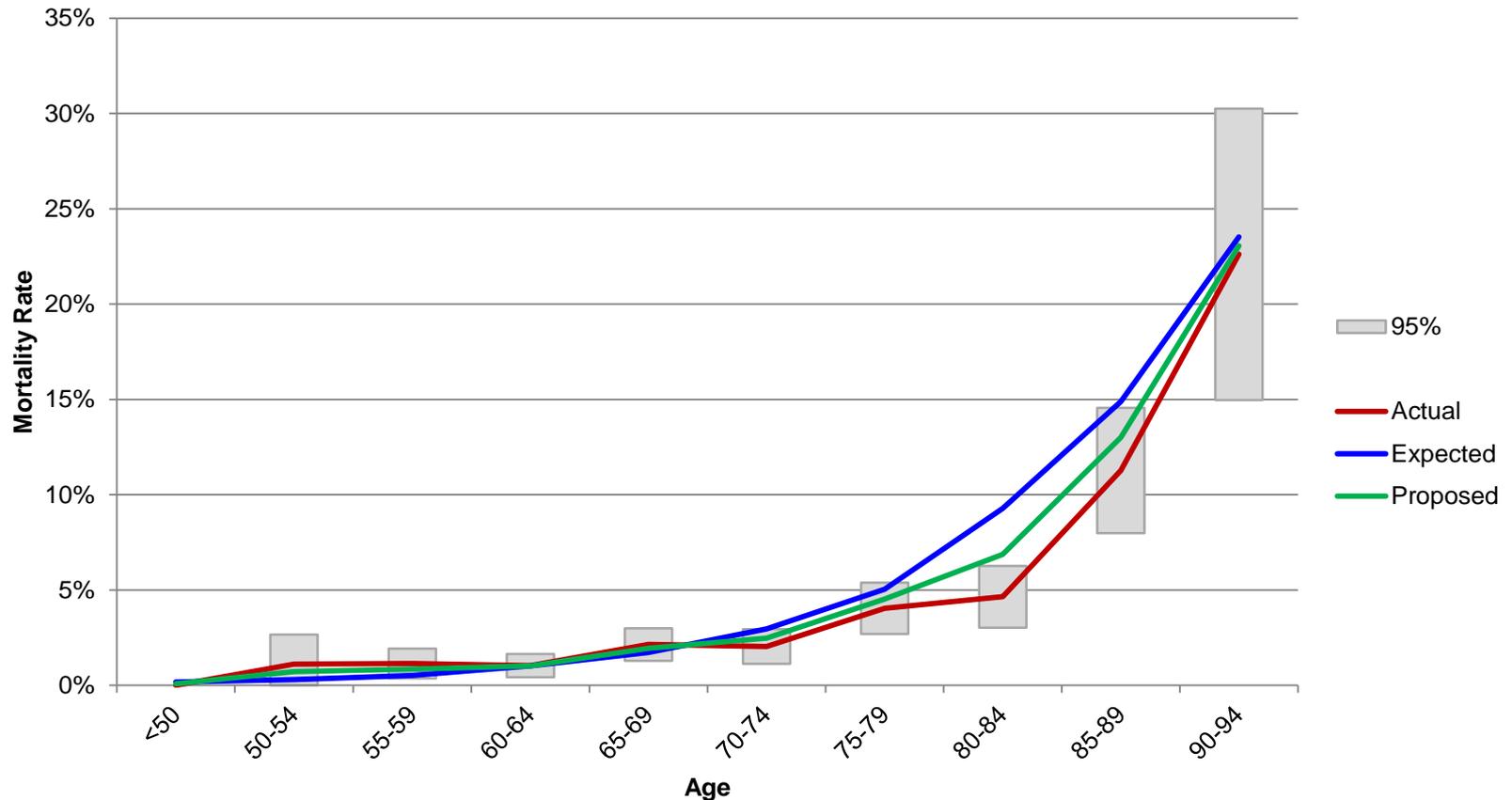
Post-Retirement Mortality – Healthy Male



Actual
vs.
Expected

Observation: Actual experience shows slightly fewer observed deaths at most ages than expected based on current mortality tables

Post-Retirement Mortality – Healthy Male



Observation: Fewer than 200 total deaths in the review period. Not enough experience for credibility.

Recommendation: Update to RP-2014 for annuitants with Blue Collar reflect updated table and to account for mortality trends in the geographical region.

Impact: Increase in liability

Post-Retirement Mortality – Healthy Female

Observation: Only 35 deaths, not large enough for credible data.

Recommendation: Update to female rates of the same table as males.

Impact: Increase in liability

Post-Retirement Mortality – Disabled Members

Observation: Only 7 deaths, not large enough for credible data.

Recommendation: Update to the RP-2014 mortality tables for disabled lives.

Impact: Increase in liability

Active Mortality

Mortality for actives is not a big driver of costs because of the number of deaths and the potentially lower amount of benefits than had the member retired.

Observation: Over the last five years, fewer actives died than expected. The number of deaths was too few for meaningful credibility.

Recommendation: Update to the RP-2014 employee tables with Blue Collar adjustment to be consistent with post-retirement assumption.

Cost impact: Increase in liability

Mortality Improvement

We have seen continued and steady improvement in mortality rates over time. Actuarial Standard of Practice No. 35 states that the actuary should “include an assumption as to expected mortality improvement after the measurement date.” Based on the recommendation contained in the August 31, 2010 experience review, the Board adopted a table that projected mortality to 2017 based on rates of mortality improvement known as Scale AA. At that time no other projection scales had been developed. Since the last experience study, the Society of Actuaries (SOA) conducted a mortality study and determined that the overall rates of mortality improvement in the US have differed from those predicted by Scale AA. In November 2014, the SOA released projection scale MP-2014 followed by MP-2015 in 2015. There are alternate viewpoints on the use of these scales. First, there are those that believe that they are unduly conservative with unrealistic mortality improvement rates. Emerging experience since the data was collected by the SOA seems to support that contention (MP-2015 projects slower improvement than MP-2014). Second, many systems administer their plan using the valuation mortality assumption. This would be difficult to do with MP-2014/2015, since they are intended to be fully generational. An acceptable alternative is to use Scale BB to project mortality a set number of years in to the future. Scale BB was released in 2012, and was intended to mimic the impact of the MP improvement scales.

Observation: SOA Study indicates that overall rates of mortality in the US have decreased faster than predicted by Scale AA (the current mortality improvement assumption)

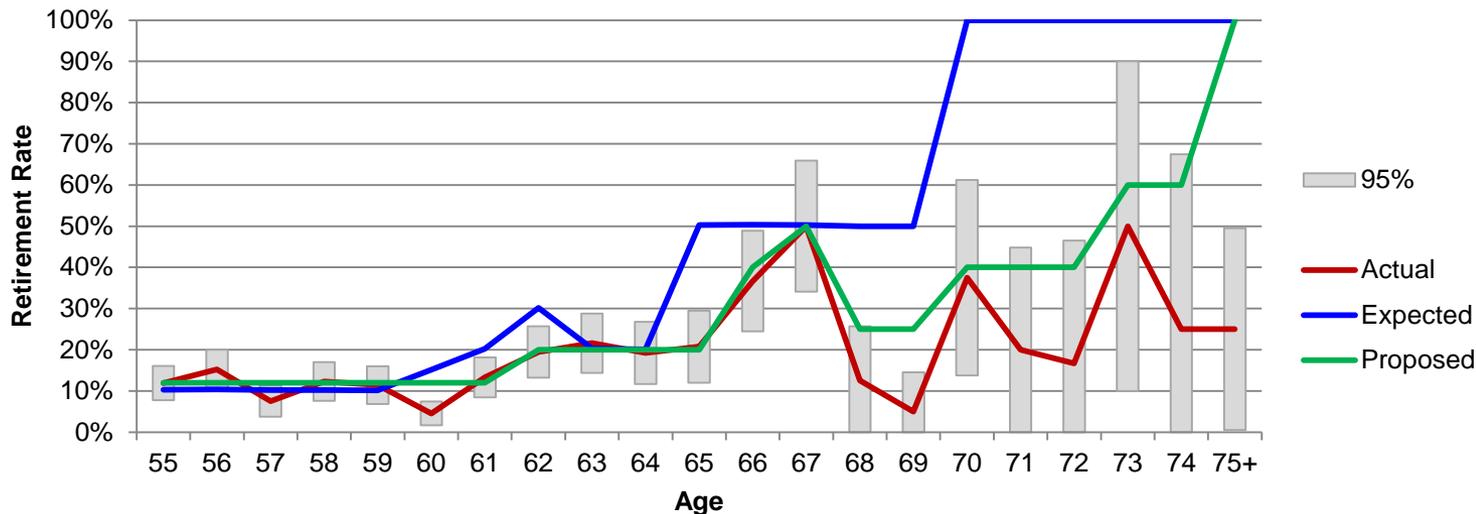
Recommendation: Project mortality improvement for healthy lives from the base rates in 2014 to 2030 using Scale BB.

Cost impact: Increase in liability

Retirement Rates - Considerations

- Retirement rates that vary by age and gender
- The current retirement rates are based on the recommendation made in the prior experience study.
- The retirement rates result in expected retirements greater than actual retirements
- Use of actual experience of the plan is common practice
- Generally, assuming more retirements results in higher estimated costs
- No experience for Second Tier Plan Members

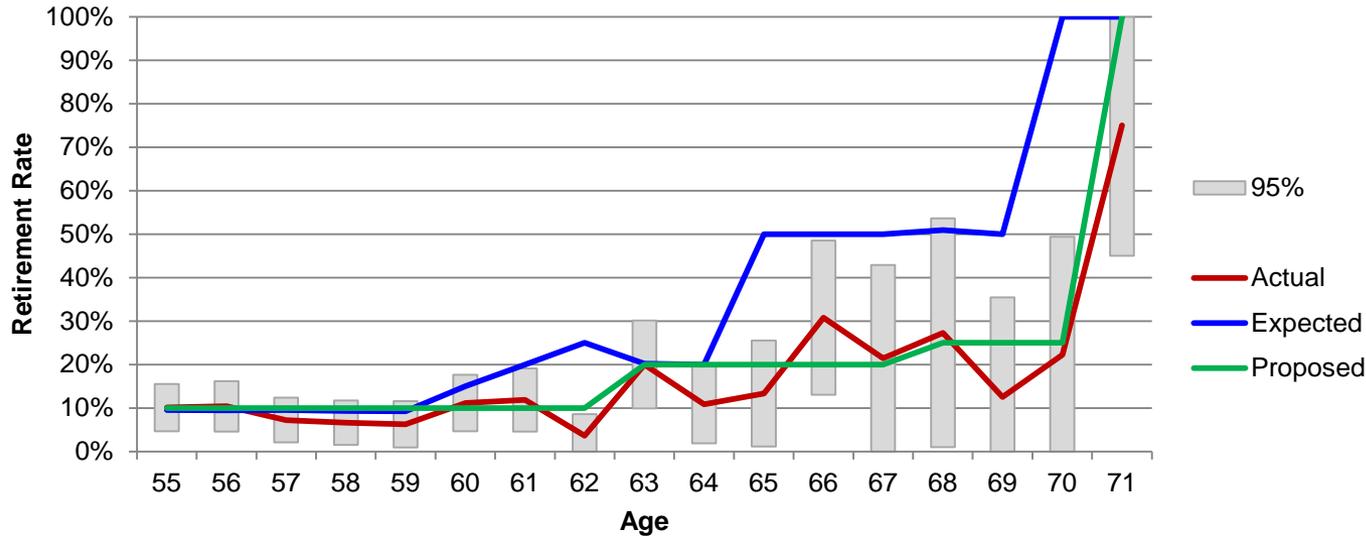
Retirement Rates – Male First Tier



Summary Metrics (Male):
 Actual: 308
 Expected: 431
 Actual to Expected: 71%
 Proposed: 345
 Actual to Proposed: 89%

Observation: Significantly fewer people retired than expected
 Recommendation: Adjust rates to reflect experience
 Impact: Decrease in liability

Retirement Rates – Female First Tier



Summary Metrics (Female):

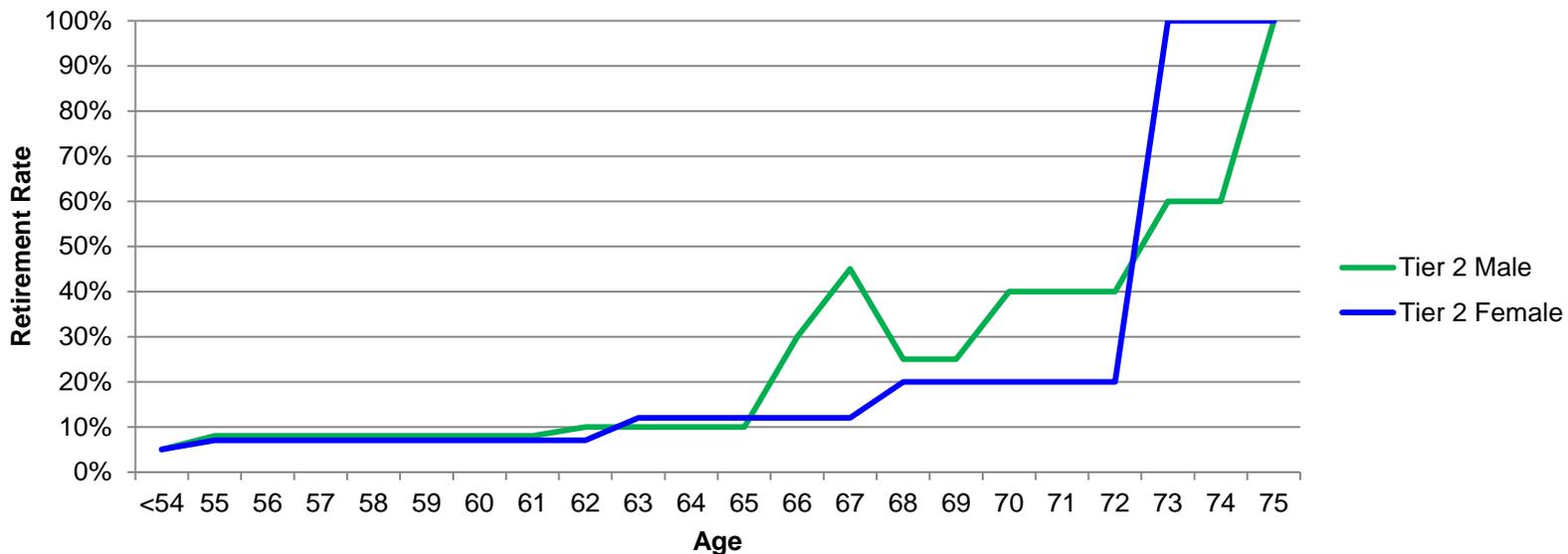
Actual: 106
 Expected: 171
 Actual to Expected: 62%
 Proposed: 121
 Actual to Proposed: 88%

Observation: Significantly fewer people retired than expected

Recommendation: Adjust rates to reflect experience

Retirement Rates – Second Tier

- No experience for Second Tier Plan Members
- Use First Tier rates, adjusted to assume that Second Tier members retire approximately two years later than First Tier members
- Once Second Tier members reach retirement eligibility, the rates can be adjusted to reflect actual experience



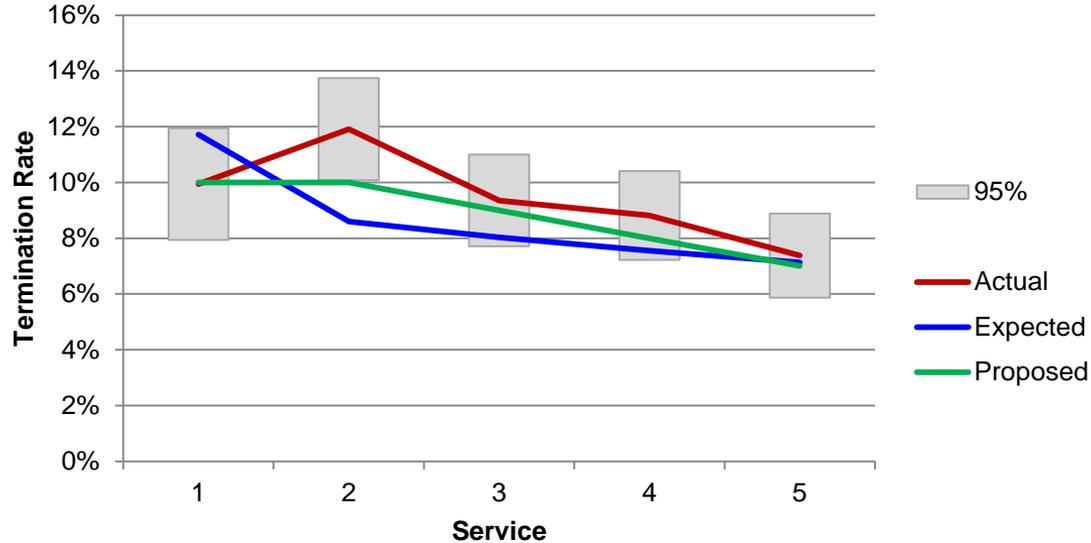
Disability Rates - Considerations

- Disability rates measure the probability that a member will become disabled and receive a disability retirement benefit
- Currently use moderate disability rates that vary by age and gender
- Actual number of disabilities has been immaterial (3 in this measurement period)
- Any assumption that attempted to project experience would have a negligible impact on total liability
- Recommend removing the assumption
 - Removing the assumption results in lower liabilities in the funding costs, but it is not anticipated to be a material item since there have been so few disabilities.

Termination Rates - Considerations

- The valuation anticipates that members may leave active service for reasons other than retirement, disability and death. We refer to these other reasons as termination.
- Rates of termination can vary significantly from plan to plan
- Use of actual experience of the plan is common practice
- Generally, assuming more terminations results in lower estimated costs
- Rates of termination tend to be higher earlier in a member's career. Therefore, higher rates (or additional rates) are often used early in a member's career
 - Current assumption varies by age, and includes added probability of termination in the first two years of employment
 - Proposed rates use:
 - a set of rates for the first five years of a member's career. These rates are higher than those assumed in the rest of the career and vary based on the member's service
 - a set of rates for the rest of a member's career that vary based on the member's age

Termination Rates (<=5 Years Service)



Summary Metrics:

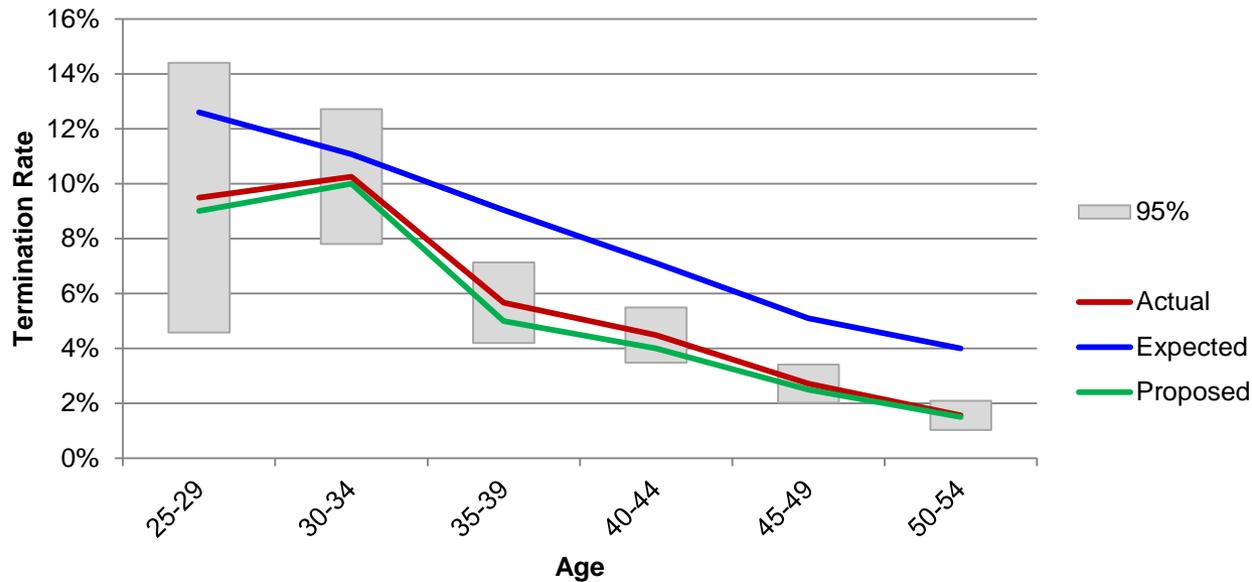
Actual: 533
Expected: 474
Actual to Expected: 112%
Proposed: 492
Actual to Proposed: 108%

Observation: There were more terminations than expected

Recommendation: Increase rates of termination to reflect experience

Impact: Decrease in liability

Termination Rates (More than 5 Years Service)



Summary Metrics:

Actual: 291

Expected: 477

Actual to Expected: 61%

Proposed: 269

Actual to Proposed: 108%

Observation: There were fewer terminations than expected

Recommendation: Decrease rates of termination to reflect experience

Impact: Increase in liability

Overtime Assumption

- Current assumption as a percentage of Base Pay: 2%
- Reviewed overtime as a percentage of actual pay for all years from 2008 through 2013.
- Observation: Overtime rate exceeded the expected rate over the review period.
- Recommendation: Adjust expected overtime rate to 4%.



Economic Assumptions

Inflation

Investment Return

Salary Increases

ASOP 27

- Provides guidance to actuaries in selecting economic assumptions
 - General Selection Process
 - Identify components, if any, of the assumption
 - Evaluate relevant data
 - Review appropriate recent and long-term historical economic data
 - The actuary should not give undue weight to recent experience
 - Some historical economic data may not be appropriate due to changes in the underlying environment
 - Consider factors specific to the measurement
 - Consider other general factors
 - The actuary should consider the balance between refined economic assumptions and materiality
 - The actuary may incorporate the views of experts but the selection or advice should reflect the actuary's professional judgment
 - Select a reasonable assumption
 - See next slide
 - After completing these steps for each economic assumption, the actuary should review the set of economic assumptions for consistency and make appropriate adjustments if necessary

ASOP 27 – Selecting a Reasonable Assumption

Recent ASOP 27 Change in Determining the Reasonableness of a Selected Assumption

- Previously: Use a “best-estimate” range
 - Assumption is reasonable if selected from within a range over which it was “more likely than not” to fall
- New: Apply best-estimate standard
 - Each economic assumption selected by the actuary should be reasonable.
 - For this purpose, an assumption is reasonable if it has the following characteristics:
 - It is appropriate for the purpose of the measurement
 - Reflects the actuary’s professional judgment
 - Takes into account historical and current economic data that is relevant as of the measurement date
 - Reflects the actuary’s estimate of future experience, the actuary’s observation of the estimates inherent in market data, or a combination thereof; and
 - Has no significant bias

Current Economic Assumptions

Inflation

3.50% per year

Real Rate of
Return

4.00% per year

Nominal Rate of
Return

7.50% per year

Merit Adjustments
(Individual Salary Increases
related to performance,
promotion, etc.)

Vary by service and employee group

Inflation

Buck inflation modeling considerations

Short-term calibration to current economic conditions
Intermediate calibration to inflation forecasts
Long term calibration to inflation forecasts and historical average inflation

Expectations of future

Data points:
3.14%: 100-year average through 1916-2016
2.0%-3.4%: 2014 & 2015 OASDI Trustees Report
3.00% Buck assumption

Proposed rate of inflation

3.00%

Investment Return Assumption - Considerations

- Use Expected Rates of Return by Asset Class Based Upon Accepted Industry Practice
- Determine Aggregate Real Return for Board's Target Asset Allocation Policy
- Recent investment performance is driven by economic and capital market factors that may or may not persist over the longer term over different economic and capital market cycles
- Actuarial Standards of Practice allow for the inclusion of a margin of conservatism
 - All else being equal, a lower return assumption is easier to achieve and has a higher likelihood of securing the benefits by increasing future contributions

Investment Return

Asset Class	Allocation
Fixed Income – Investment Grade	28.00%
Domestic Equity	33.00%
International Equity	20.00%
Real Estate	10.00%
Alternatives	9.00%
	<hr/>
	100.00%

The assumed rate of return is based on the target asset allocation and the expectation of future asset returns for each asset class. The current return assumption of 7.5% was last reviewed and adopted during the 2011 Experience Study.

On the next slide we have estimated nominal and real returns over various time periods based on this allocation and Buck's current return expectations.

Nominal and Real Returns - Buck Estimate

Compound (Geometric) Returns over Projected Periods

	1-Year	5-Year	10-Year	15-Year	20-Year	25-Year	30-Year
Nominal							
75th Percentile	11.59%	10.08%	10.10%	10.32%	10.42%	10.62%	10.78%
60th Percentile	8.90%	8.22%	8.65%	9.05%	9.21%	9.53%	9.68%
50th Percentile	7.11%	7.24%	7.80%	8.27%	8.63%	8.82%	8.94%
40th Percentile	5.20%	6.00%	6.95%	7.55%	7.91%	8.12%	8.34%
25th Percentile	1.97%	3.85%	5.44%	6.40%	6.73%	7.25%	7.42%
Real							
75th Percentile	9.39%	7.98%	7.57%	7.54%	7.52%	7.49%	7.54%
60th Percentile	6.75%	5.95%	6.29%	6.53%	6.49%	6.60%	6.61%
50th Percentile	5.02%	4.98%	5.47%	5.71%	5.81%	5.92%	6.08%
40th Percentile	2.86%	3.73%	4.57%	4.94%	5.15%	5.32%	5.41%
25th Percentile	-0.30%	1.70%	3.06%	3.63%	4.05%	4.35%	4.44%

Based on 2016 assumptions. Amounts shown are net of investment expenses.

The current assumption of 7.50% is expected to be achieved on average at least 60% of the time over time horizons of 15 years and beyond.

Current standards of practice suggest the use of an assumption that falls within the 40th and 50th percentile of projected returns based on the long term asset allocation. This is a change from the last time we reviewed the assumed rate of return, where the Actuarial Standards of Practice defined the range as between the 25th and 75th percentiles. Under the previous guidelines, Buck restricted the range to returns that were between the 25th and 75th percentiles.

Based on the above, the 7.5% investment return assumption can be maintained. However, it would reflect a real return of 4.5% and an inflation component of 3.0%.

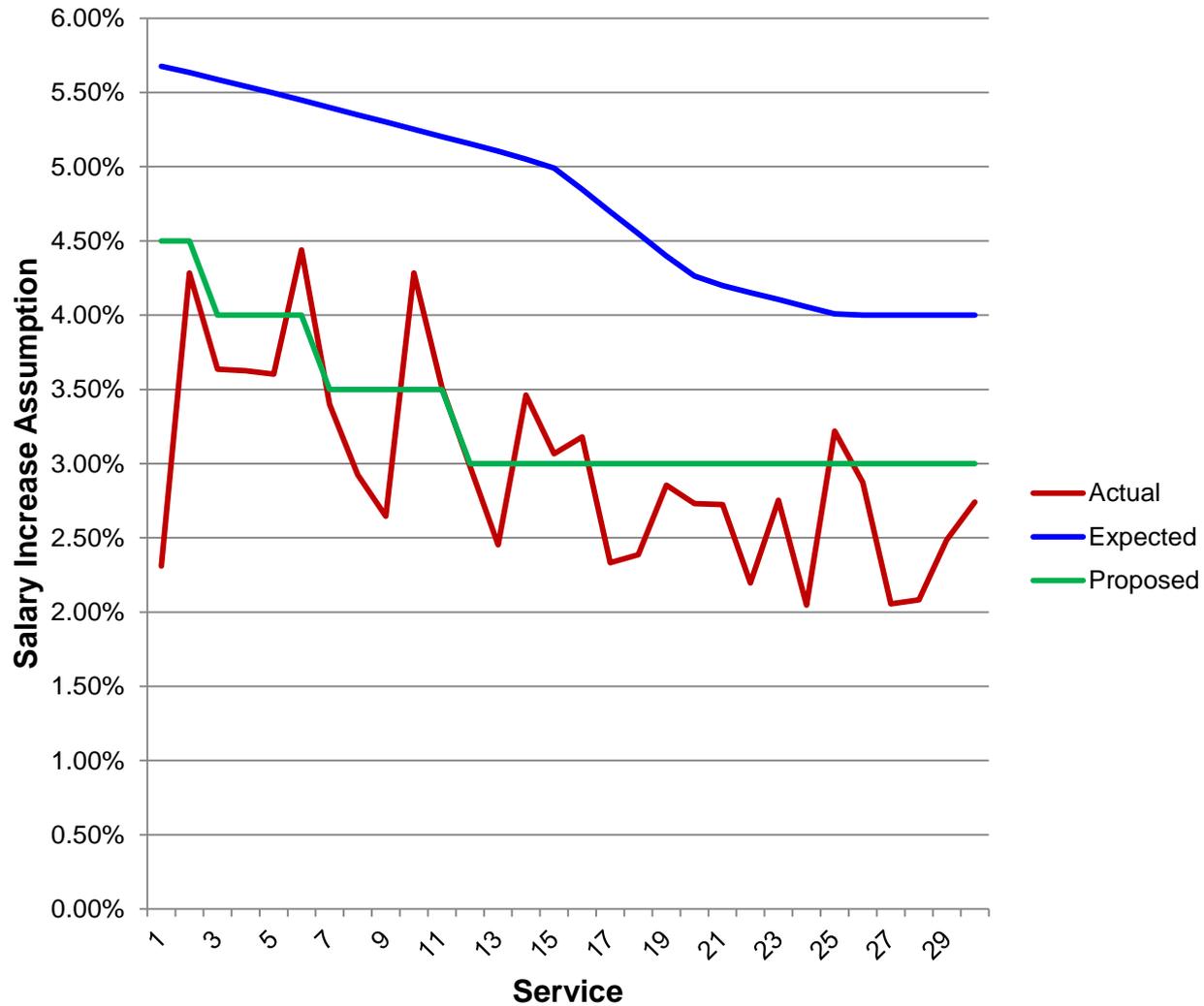
Salary Increases

- Generally, a participant's compensation will increase over the long term based on:
 - Inflation,
 - Merit Adjustments
- The assumption used to measure the anticipated year-to-year change in compensation is referred to as the assumed Annual Rate of Salary Increase
 - Building-block approach to setting assumption (Inflation plus Productivity plus Merit)
 - Merit adjustments vary by service and employee group

Merit Adjustments

- Merit increases are not related to across-the-board type increase (i.e., inflation)
- Includes elements of salary increase due to promotions and longevity
- Reviewed actual salary increases from 2010 – 2014
- The valuation anticipates salary increases for members during their career
- Higher (lower) salary increases result in higher (lower) estimated benefits and higher (lower) projected costs.
- Because contributions are financed over projected payroll, higher (lower) salary increases tend to defer (accelerate) employer contributions.

Proposed Salary Increases



Salary Increases

- Observation: Salary increases continue to be significantly less than expected. Service continues to be a better indicator of salary increases than age.
- Recommendation: Reduce rates at all ages and base rates on service. Minimum increase for later career is 3.00%.
- Cost impact: Decrease in liability

Cost Impact

Had the proposed assumptions and methods been reflected for the September 1, 2014 annual actuarial valuation, the impact would have been a net increase in costs and net decrease in years to fund:

El Paso City Employees' Pension Fund	Current Valuation	Proposed Assumptions	Difference	% Change
Actuarial Accrued Liability (AAL)	\$859,745,000	\$890,065,000	\$30,320,000	3.53%
AAL – Active	\$412,426,000	\$399,729,000	(\$12,697,000)	(3.08)%
AAL – Non-Active	\$447,319,000	\$490,336,000	\$43,017,000	9.62%
Actuarial Value of Assets (AVA)	\$663,063,000	\$663,063,000	\$0	0.00%
Unfunded AAL (AAL – AVA)	\$196,682,000	\$227,002,000	\$30,320,000	15.42%
Normal Cost Rate	14.48%	13.05%	(1.43%)	N/A
Normal Cost Rate – Adjusted for Overtime	14.20%	12.55%	(1.65%)	N/A
Tier 2 Normal Cost Rate – Adjusted for Overtime	12.46%	10.38%	(2.08%)	N/A
Member Contribution Rate	8.95%	8.95%	0.00%	N/A
Employer Normal Cost Rate	5.25%	3.60%	(1.65%)	N/A
Funding period to amortize UAAL	11 years	11 years	0 years	N/A

Disclosures

- Buck's work product contained herein was prepared exclusively for the Board of Trustees and Staff of EPCEPF. It is a complex, technical analysis that assumes a high level of knowledge concerning the operations of the Fund.
- No third party recipient of Buck's work product should rely upon Buck's work product absent involvement of Buck or without our approval. Third parties recipients inclined to present our work product should engage EPCEPF and Buck during the presentation process to ensure that this work product is appropriately represented. Buck Consultants will accept no liability with respect to any representations or warranties based on any statements or conclusions contained in this presentation without our prior written consent.
- The consultants who worked on this assignment are pension actuaries with significant experience in public funds like EPCEPF. Buck's advice is not intended to be a substitute for qualified legal or accounting counsel.
- Except as noted in the presentation, results were based on the same plan provisions, assumptions, data, assets and methods as noted in the 2014 valuation report. The funded ratios shown are appropriate for use in evaluating the need and level of future contributions but do not reflect any possible settlement of liabilities such as through annuity purchases.

Certification

The results were prepared under the direction of David Kent who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about them.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law.

Except where otherwise indicated, an analysis of the potential range of such future differences is beyond the scope of this report.

David Kent, FSA, EA, MAAA
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