Alameda County Employees' Retirement Association

2020 Actuarial Experience Study
September 17, 2020

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 5659105v6

Segal

Selection of Actuarial Assumptions

- New assumptions will be used in December 31, 2020 valuation
  - Sets contributions for 2021 – 2022 fiscal year
- Actuarial assumptions – two kinds
  - Demographic — When benefits will be payable
  - Economic — How assets, and salaries and benefits increase
- Objective, long term
- Recent experience or future expectations
  - Demographic: recent experience
  - Economic: not necessarily!
  - Note: ongoing effect of COVID-19 is beyond scope of this study
- System specific or not
  - All assumptions are system specific except price inflation
- Consistency among assumptions
- Desired pattern of cost incidence
  - Good assumptions produce level costs
  - Beware “results based” assumptions!

Always Remember

C + I = B + E

Contributions + Investment Income

equals

Benefit Payments + Expenses

- Actuarial valuation determines the current or “measured” cost, not the ultimate cost
- Assumptions and funding methods affect only the timing of costs (unless benefits are affected!)

Demographic Assumptions

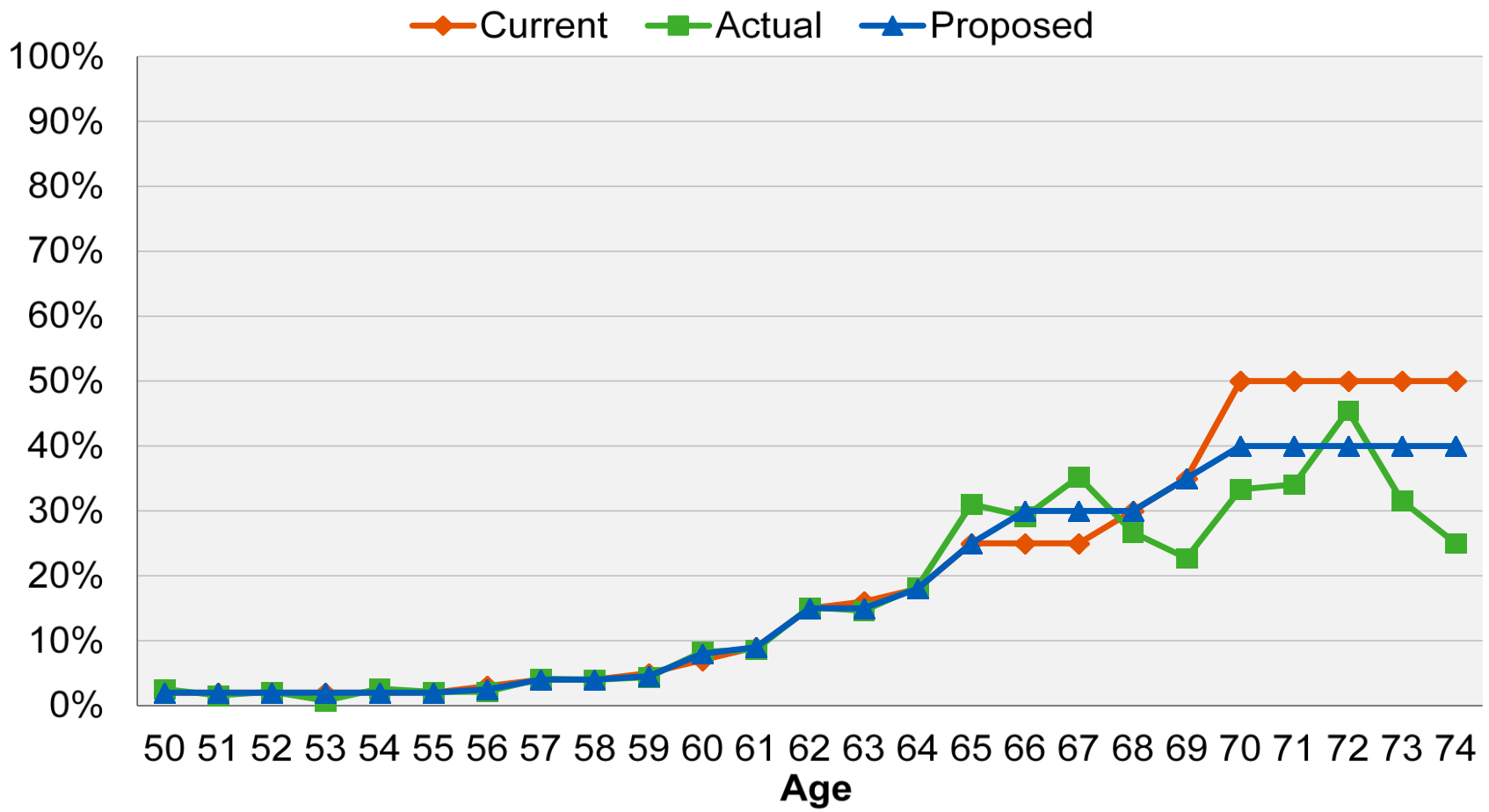
- Rates of “decrement”
  - Termination, mortality, disability, retirement
  - Termination
    - Withdrawal
    - Deferred vested
  - Mortality
    - Before and after retirement
    - Service retiree, disabled retiree, beneficiary
- Percent married
- Member/spouse age difference
- Reciprocity
- Unused sick leave
- Assumptions can be distinct for General and Safety
  - Also for different tiers

Recommendations – Demographic

- Retirement rates
  - Change in structure to use both age and service for Tier 2
  - For members with under 30 years of service
    - Later retirements for General and Safety members
  - For members with over 30 years of service
    - Earlier retirements for General and Safety members
  - Adjust retirement rates for CalPEPRA formulas consistent with adjustments for the legacy formulas

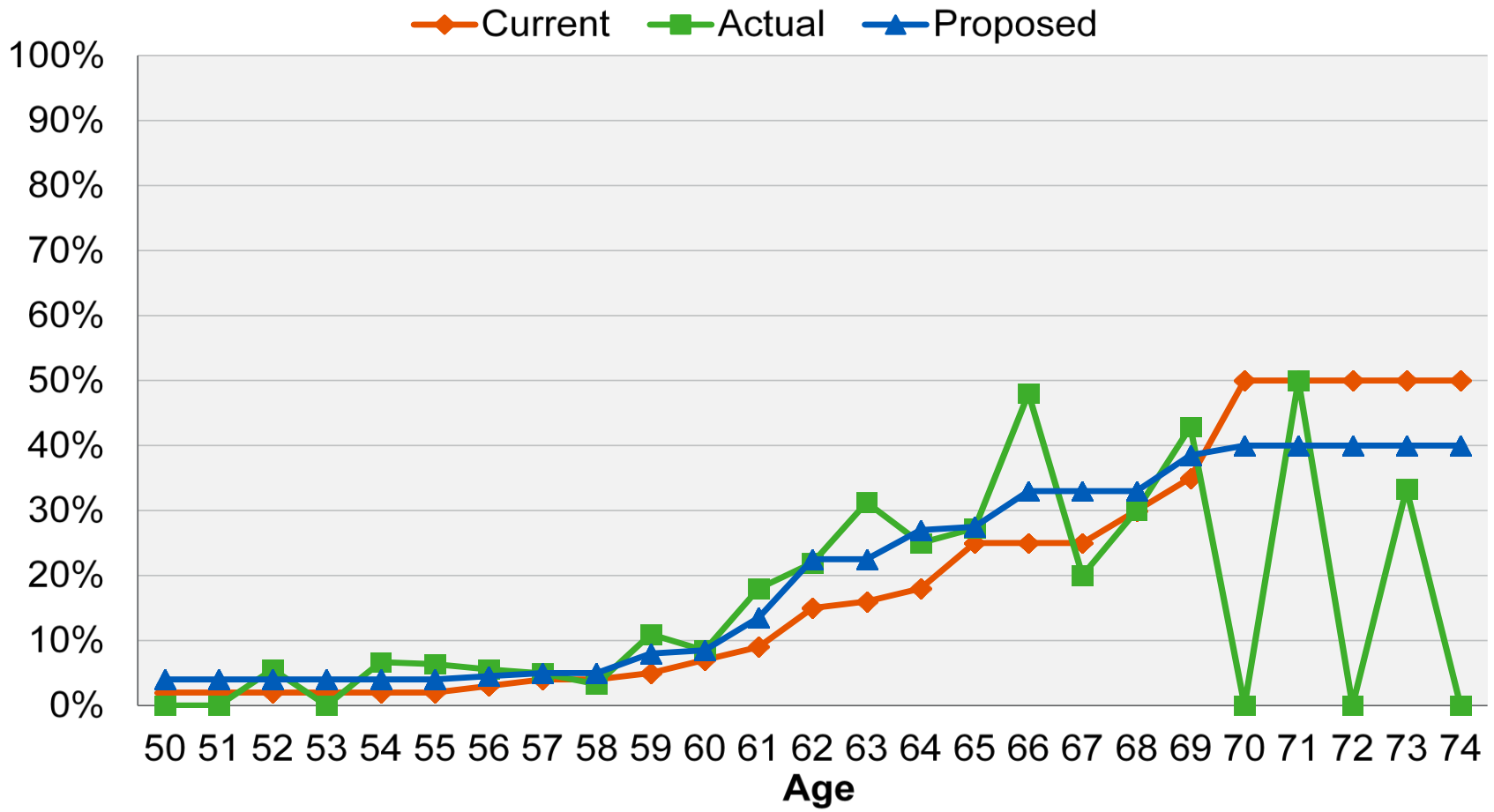
Retirement Rates – General Tier 2

Chart 4A: Retirement Rates
General Tier 2 Members with Less than 30 Years of Service



Retirement Rates – General Tier 2

Chart 4B: Retirement Rates
General Tier 2 Members with 30 or More Years of Service



Recommendations – Demographic

- Termination rates:
  - Change in structure to use service only
  - Decrease assumption for proportion of members electing a refund
- Disability incidence:
  - Decrease assumption overall for General and increase assumption overall for Safety

Setting Actuarial Assumptions – Mortality Assumptions for ACERA

- Current mortality assumptions for ACERA members
  - Assumptions adopted with last experience study and used for 12/31/2017, 12/31/2018 and 12/31/2019 valuations
  - Generational projection of future mortality improvement
  - Separate headcount weighted mortality tables for General and Safety members
    - Both using RP-2014 as base table
      - RP-2014 table developed using private sector mortality experience
    - Adjusted based on 6 years of ACERA mortality experience
      - General retirees expected to live about as long as base table
      - Safety retirees expected to live about as long as base table
- ACERA adopted generational improvement in 2017 study
  - Recommend continued use of generational improvement
  - ACERA current mortality improvement scale is MP-2016
  - Recommended mortality improvement scale is MP-2019
    - MP-2019 anticipates less future mortality improvement as compared to MP-2016

Setting ACERA Mortality Assumptions – Headcount weighted basis vs benefit weighted

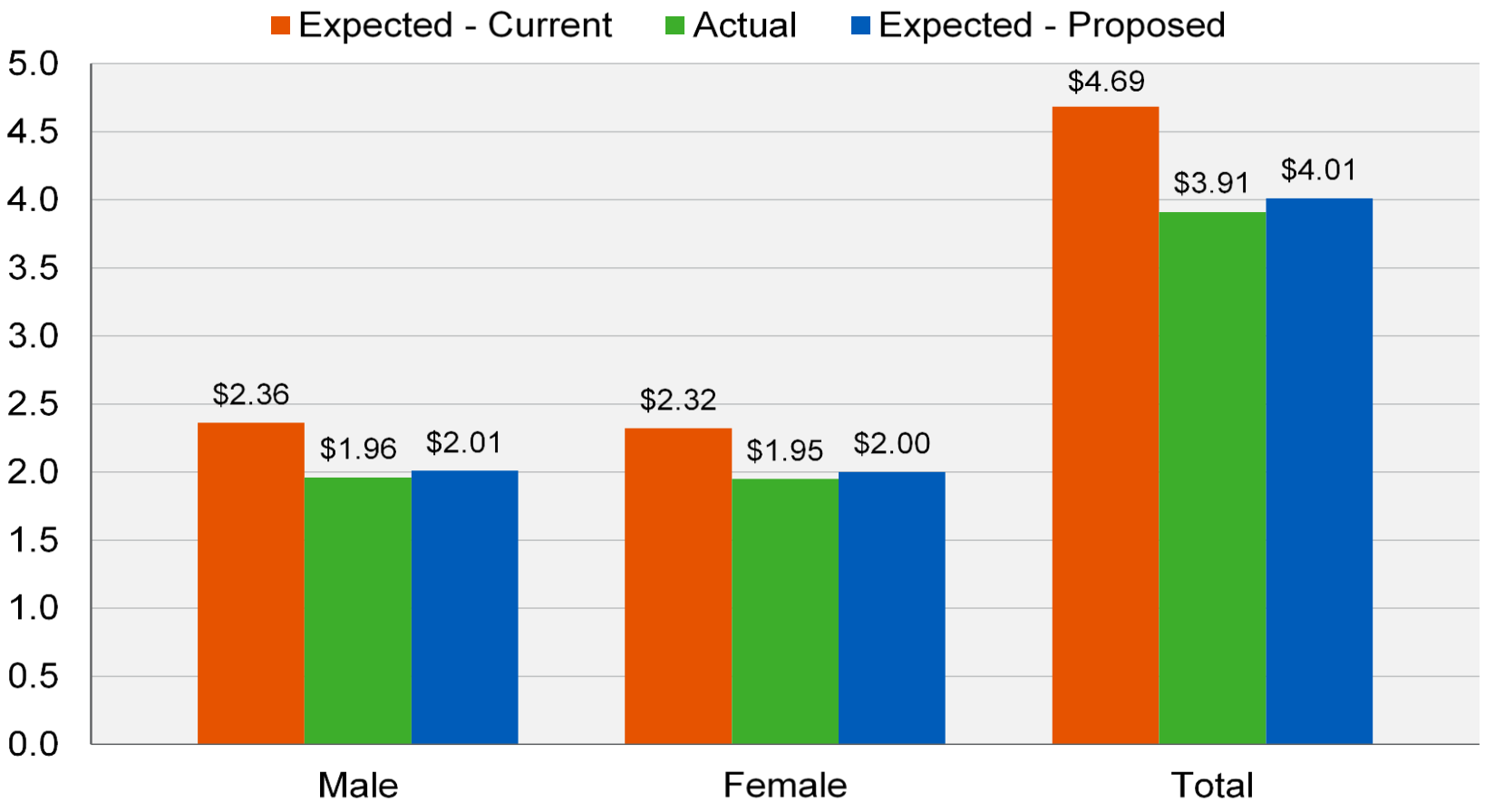
- 2017 study noted upcoming change from headcount weighted basis to benefit weighted basis for pension (or non-OPEB) benefits
  - Headcount weighted looks at number of members who die or survive
    - Still appropriate for OPEB benefits paid by SRBR
  - Benefit weighted basis reflects how income affects mortality
    - Important because pension liability is greater for members with higher benefits
    - Consistent with recommendation made by ACERA's actuarial auditor in 2017
  - Switch to benefit weighted basis was deferred, pending new mortality tables based on public sector experience
- Pub-2010 tables published by the Retirement Plans Experience Committee (RPEC) of the Society of Actuaries (SOA) in 2019
  - Separate tables for
    - Job category (i.e., General, Safety and Teacher)
    - Pre and post retirement
    - Healthy annuitant, disabled annuitant and survivor
    - Three benefit weighted tables
      - Above-median benefit, total population, below-median benefit
      - ACERA benefits are above median

Setting ACERA Mortality Assumptions – Credibility of ACERA mortality experience

- Greater focus on "credibility" of ACERA specific data
  - About 1,000 deaths needed for full credibility for headcount-weighted mortality
    - Where full credibility means 90% confidence that the actual experience will be within 5% of the expected value
    - More than 1,000 deaths required under benefit weighted basis
      - Because dispersion of retirees' benefit amounts is taken into account
    - With full credibility, can adjust standard tables to match observed experience
      - Otherwise must weight observed experience and standard table
    - Can mean more stable assumptions (especially for smaller groups like Safety)
- Credibility of ACERA specific data
  - ACERA's mortality experience over a 9-year period is slightly more credible for General members and less credible for Safety members
    - Partially adjust the Pub-2010 mortality tables to fit ACERA's experience
    - Pub-2010 rates with no adjustment for General and Safety

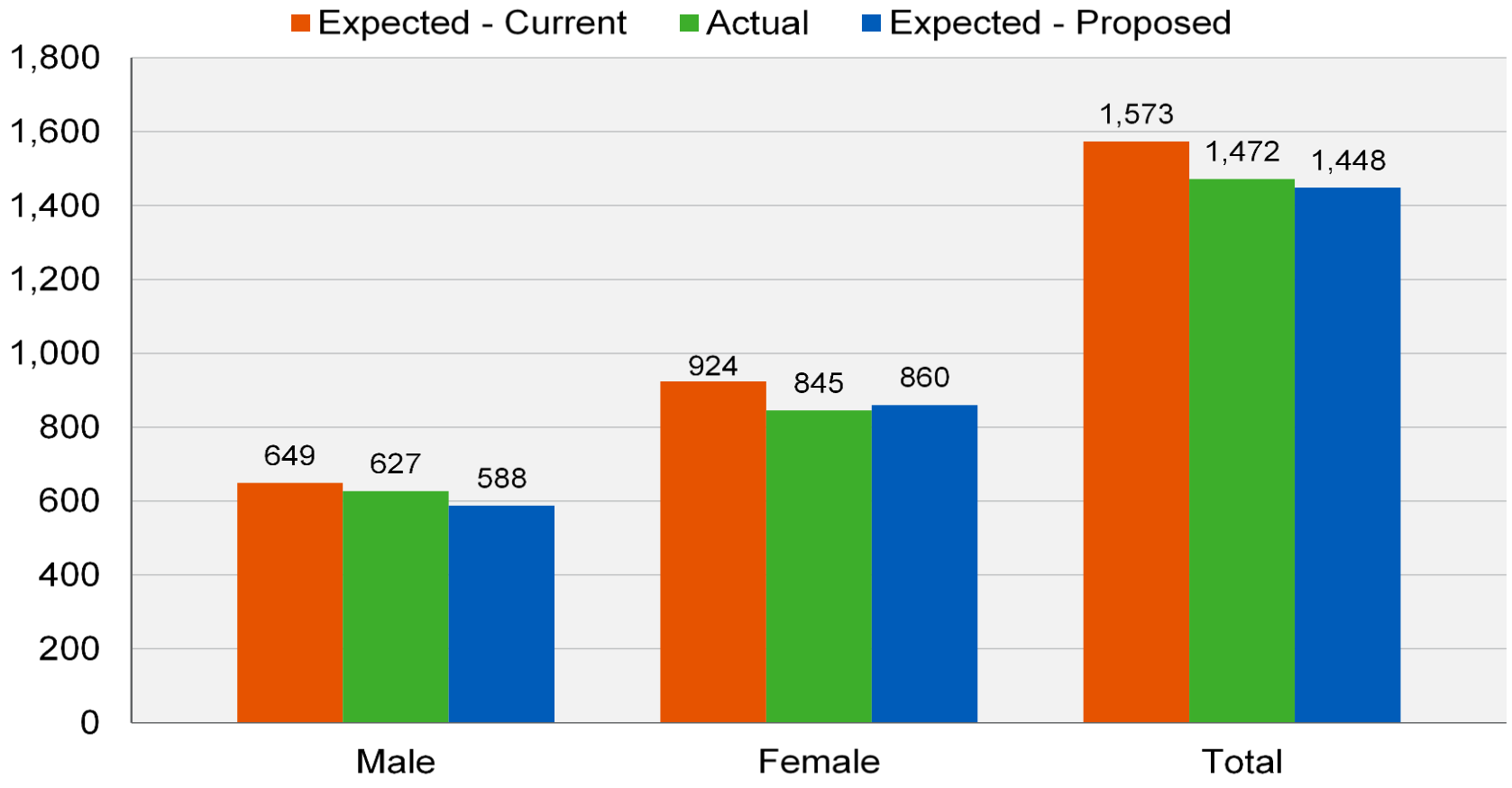
Setting ACERA Mortality Assumptions – Mortality Assumptions Example

Chart 10: Post-Retirement Benefit-Weighted Deaths (In Millions)
Non-Disabled General Members (December 1, 2010 through November 30, 2019)



Setting ACERA Mortality Assumptions – Mortality Assumptions Example

Chart 12: Post-Retirement Headcount-Weighted Deaths
Non-Disabled General Members (December 1, 2010 through November 30, 2019)
For OPEB SRBR Valuation



Recommended ACERA Mortality Assumptions

- General retirees base table:
  - Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate males and females tables)
  - Base table actual to expected ratio is 97%
- Safety retirees base table:
  - Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate males and females tables)
  - Base table actual to expected ratio is 107%
- Both tables projected generationally with the two-dimensional mortality improvement scale MP-2019
- Impact of new mortality assumptions on valuation results
  - Increase in liabilities and contribution rates for General members due to effect of new benefit weighted mortality assumptions
  - Increase in liabilities and contribution rates for Safety members also due to effect of new benefit weighted mortality assumptions

Discussion

Economic Assumptions

- Price Inflation (CPI)
  - Investment Return, Salary Increases, COLA
- Salary Increases
  - "Across the board" increases
    - Includes price inflation plus real wage growth
  - Merit & Promotion: based on experience
    - More like a "demographic" assumption
  - Terminal pay
- Investment Return
  - Components include CPI, real return, investment and administrative expenses
  - Generally based on passive returns
- Impact of 50/50 Excess Earnings Allocation on Investment Return
  - Disclosure provided for informational purposes only

Recommended Economic Assumptions – Summary

	2017 Study Adopted		2020 Study Recommended	
	Return	Pay*	Return	Pay*
Price Inflation	3.00%	3.00%	2.75%	2.75%
Real Wages	n/a	0.50%	n/a	0.50%
Net Real Return	4.25%**	n/a	4.25%**	n/a
Total	**7.25%**	**3.50%**	**7.00%**	**3.25%**

* Excludes merit and promotion component of assumed individual salary increases

** Recommended return is net of investment and administrative expenses

Recommended Economic Assumptions – Summary

- Price Inflation (CPI)
  - Decrease from 3.00% to 2.75%
- Retiree Cost of Living Increases
  - Decrease from 3.00% to 2.75%
- Salary Increases
  - Decrease price inflation from 3.00% to 2.75%
  - Maintain “across the board” real wage growth at 0.50%
  - Total wage inflation is decreased from 3.50% to 3.25%
  - Merit and promotion – changes based on experience

Recommended Economic Assumptions – Summary

- Investment Return
  - Decrease from 7.25% to 7.00%
    - Includes 2.75% price inflation and net real return of 4.25%
    - Net real return maintained at 4.25%
- Impact of 50/50 Excess Earnings Allocation on Investment Return
  - For informational purposes only
  - Estimated impact increases from 0.60% to 0.65%

Recommended Economic Assumptions – Price Inflation

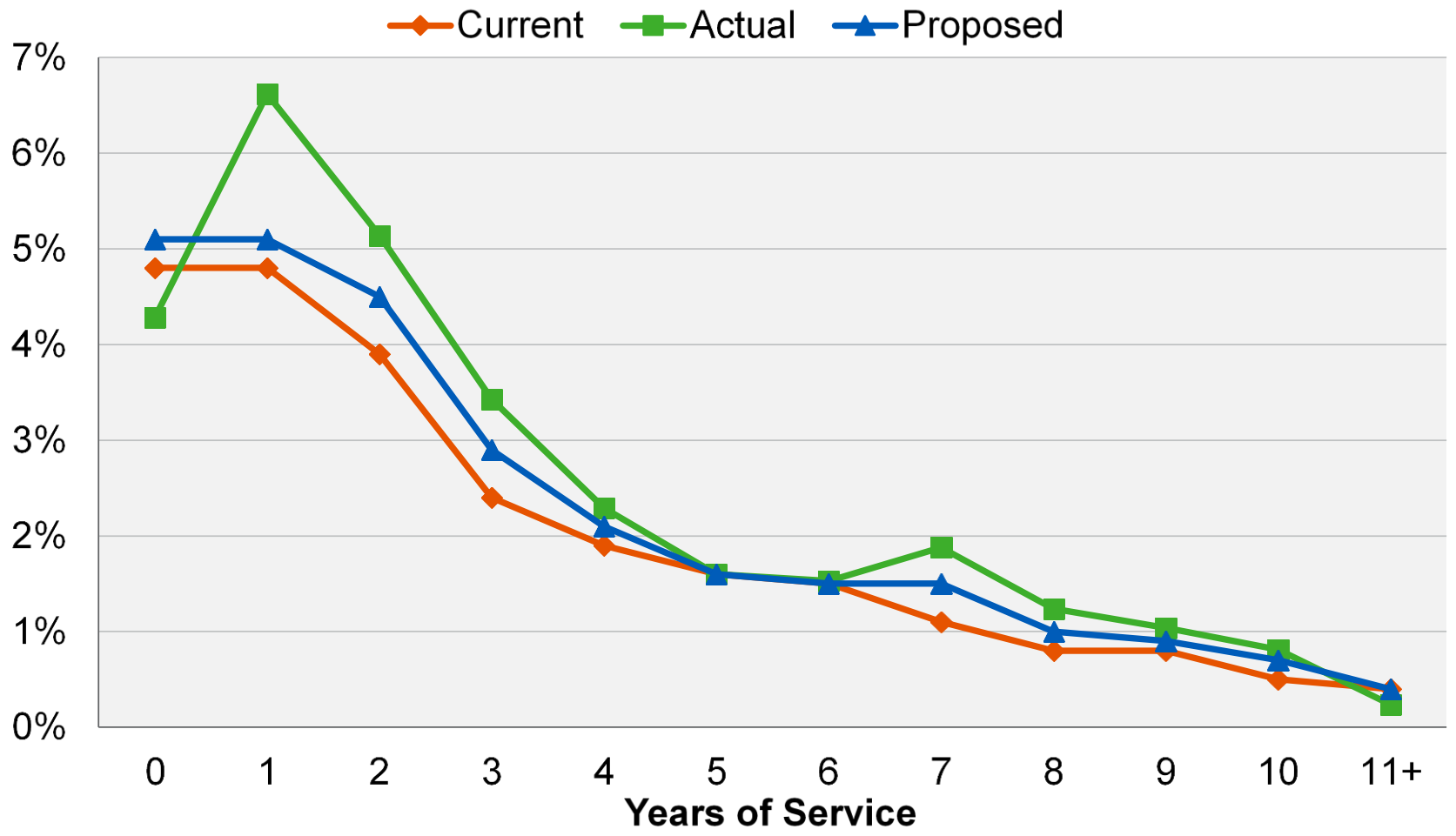
- Historical Consumer Price Index
  - Averages declining due to low inflation over past 20 years, but still substantially higher than current inflation rates
- NASRA Survey
  - Median inflation assumption is 2.65%
- Social Security Intermediate Forecast = 2.40%
- Verus anticipates long-term inflation of 1.90%
  - Average inflation from survey of 7 consultants = 2.33%
- Market based inflation expectations = 1.60% (July 2020)
- Recommend decreasing price inflation from 3.00% to 2.75%
  - Segal generally recommending 0.25% decrease in inflation assumption

Recommended Economic Actuarial Assumptions – Salary Increases

- Three components:
  - Price inflation: decrease from 3.00% to 2.75%
  - "Across the board" real wage growth: maintain at 0.50%
    - Department or Labor: Historically: 0.4%-0.7% for state and local governments
    - Social Security projects 1.1% (median assumptions)
  - Merit and Promotion: from experience study
    - Assumption based on years of service
    - General: Currently 4.80% (0-1 years) to 0.40% (11+ years)
      - Increases for most service categories before 11 years of service
    - Safety: Currently 7.80% (0-1 years) to 0.80% (11+ years)
      - Increase for most service categories before 9 years of service

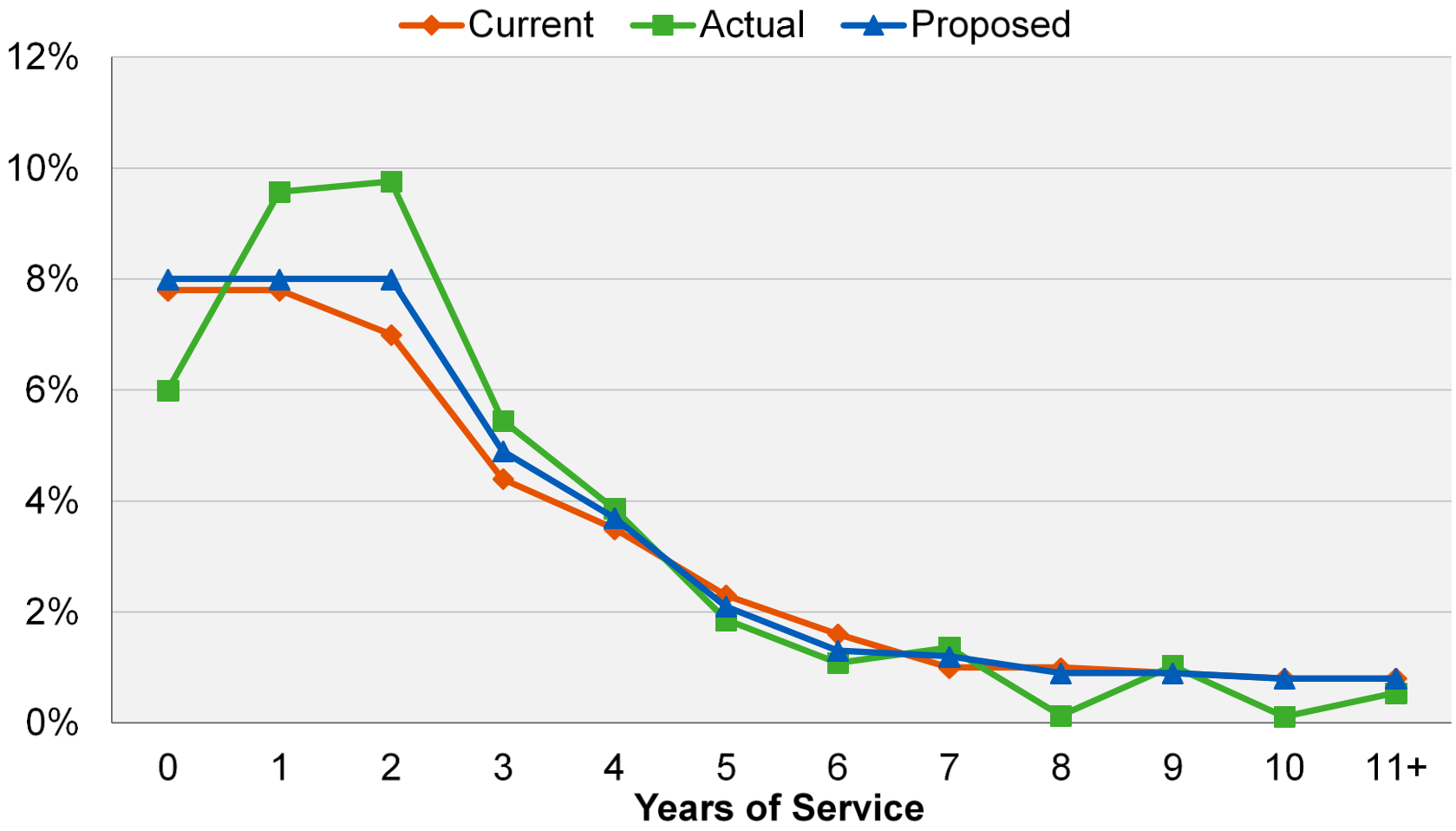
Merit and Promotion Salary Increases – General

Chart 1: Merit and Promotion Salary Increase Rates
General Members



Merit and Promotion Salary Increases – Safety

Chart 2: Merit and Promotion Salary Increase Rates
Safety Members



Recommended Economic Assumptions – Payroll Growth and Terminal Pay Assumptions

- Active member payroll based on wage inflation
  - Assume constant future active headcount
  - Used to project total payroll for UAAL amortization
- Includes price inflation and "across the board" real wage growth
  - Price inflation: decrease from 3.00% to 2.75%
  - Real increases: maintain at 0.50%
  - Total is decreased from 3.50% to 3.25%
- Terminal Pay
  - According to ACERA, recent Supreme Court decision on compensation earnable does not affect the terminal pay elements for legacy members
  - Decrease assumption for most General members and Safety members

Question?

Setting Economic Actuarial Assumptions – Investment Return Assumption

- Used to set the discount rate for measuring costs
  - Sometimes called the assumed interest rate
- Used for contribution requirements
  - Also for financial reporting (GASB 67 and 68)
- Affects timing of Plan cost
  - Lower assumed rate means higher current cost
  - Ultimately, actual earnings determine cost
    C + I = B + E
  - "Can't pay benefits with assumed earnings!"

Setting the Investment Return Assumption

- Building-Block Method
  - Four components:
    - Expected inflation: consistent with salary increases
    - Real return for each asset class
      - Weighted by asset allocation
    - Less assumed expenses (investment and administrative)
    - Less risk adjustment ("margin for adverse deviation")
      - Expressed as confidence level above 50%
- Note: generally no add-on for superior managers
  - "Indexed" returns, no "alpha"
- Sources of real return data:
  - Investment consultants (your Fund and industry)

Setting the Investment Return Assumption – Building Block Components – Preview

	2014 Study	2017 Study	2020 Study
Assumed Inflation	3.25%	3.00%	2.75%
Portfolio Real Rate of Return	5.54%	5.35%	5.56%
Assumed Expenses	(0.90%)	(0.90%)	(0.95%)
Risk Adjustment	(0.29%)	(0.20%)	(0.36%)
Total	**7.60%**	**7.25%**	**7.00%**
Confidence Level	53%*	53%	54%

* Confidence level had been at 56% for many years prior to the 2014 study

Setting the Investment Return Assumption – Real Return Component

- Real returns by asset class
  - Use an average of 7 investment advisory firms retained by Segal's California public clients
    - Use results from Verus for asset categories unique to ACERA
  - Expected real return for ACERA asset allocation is 5.56%
    - Increased from 5.35% in 2017 study
    - Change in the real rate of return (-0.06% under the 2017 asset allocation)
    - Change in the Association's target asset allocation (+0.16%)
    - Interaction effect between these changes (+0.11%)

ACERA Real Rate of Return

Asset Class	Target Allocation	Real Return	Weighted Return
US Large Cap Equity	22.40%	5.43%	1.22%
US Small Cap Equity	2.50%	6.21%	0.16%
International Developed Equity	17.00%	6.67%	1.13%
International Small Cap Equity	3.00%	7.36%	0.22%
Emerging Markets Equity	5.00%	8.58%	0.43%
Core Plus Fixed Income	11.50%	1.10%	0.13%
High Yield Bonds	1.60%	2.91%	0.05%
Global Fixed Income	3.00%	-0.63%	-0.02%
Private Equity	10.50%	10.00%	1.05%
Core Real Estate	8.00%	4.58%	0.37%
Commodities	0.75%	3.46%	0.03%
Infrastructure	1.75%	7.80%	0.14%
Private Credit	4.00%	8.50%	0.34%
Absolute Return	9.00%	3.70%	0.33%
Total	100.00%		5.56%

Administrative and Investment Expenses ($000s)

Year Ending December 31	Average Market Value of Assets	Investment Expenses	Non-Investment Expenses[1]	Investment %	Non-Investment %	Total %
2015	$6,714,319	$55,734	$15,403	0.83	0.23	1.06
2016	6,803,102	49,978	15,808	0.73	0.23	0.96
2017	7,538,840	60,124	15,775	0.80	0.21	1.01
2018	7,852,343	59,934	16,470	0.76	0.21	0.97
2019	8,190,933	52,101	16,629	0.64	0.20	0.84
			Average	0.75	0.22	0.97
			Current Assumption	0.65	0.25	0.90
			Recommended Assumption	**0.75**	**0.20**	**0.95**

[1] Includes administrative, legal, technology, actuarial, and business continuity expenses.

- Based on this experience, we have increased the future total expense component from 0.90% to 0.95%.

Setting the Investment Return Assumption – Risk Adjustment Component

- Risk adjustment model and confidence level
  - Compares the Association's risk position over time
  - Confidence level is a relative, not absolute, measure
    - Can be reevaluated and reset for future comparisons
  - Confidence level is based on standard deviation
    - Measure of volatility based on portfolio assumptions
  - Results should be evaluated for reasonableness

Setting the Investment Return Assumption

- Risk adjustment model and confidence level (continued)
  - Most useful for comparing risk position over time
  - Confidence level is based on standard deviation
    - Relative likelihood that actual average 15-year return will exceed investment return assumption on expected value basis

Year Ending December 31	Investment Return Assumption	Risk Adjustment	Confidence Level
2005	7.90%	0.46%	56%
2006	8.00%	0.41%	56%
2007	8.00%	0.38%	56%
2009	7.90%	0.49%	56%
2011	7.80%	0.53%	56%
2014*	7.60%	0.29%	53%
2017	7.25%	0.20%	53%
2020 (Recommended)	7.00%	0.36%	54%

* Based on the 7.60% investment return assumption adopted by the Board. In our December 31, 2014 triennial experience study report, we calculated a 54% confidence level based on an recommended investment return assumption of 7.50%.

Setting the Investment Return Assumption -- Building Block Components

	Current	Recommended
Assumed Inflation	3.00%	2.75%
Portfolio Real Rate of Return	5.35%	5.56%
Assumed Expenses	(0.90%)	(0.95%)
Risk Adjustment	(0.20%)	(0.36%)
Total	**7.25%**	**7.00%**
Confidence Level	53%	54%

Setting the Investment Return Assumption – Comparison with Other Models

- Segal's model for review of earnings assumption
  - Uses forward looking expected arithmetic average returns
    - No surplus or asset shortfall on expected value basis
- Comparison with an alternate model in common use
  - Uses forward looking expected geometric average returns
    - No surplus or asset shortfall on a median value basis
    - Expected geometric returns are lower than expected arithmetic returns
  - However, under this model, earning assumptions are not reduced for future investment expenses
    - Hence in practice, comparable results between earnings assumptions set using this model versus using Segal's model
- Segal ran ACERA's asset allocation through this model
  - Using a national survey of capital market assumptions (Horizon)
    - Stochastic simulation using 10,000 trial outcomes
  - 55% likelihood of achieving 7.00% using 15-year returns

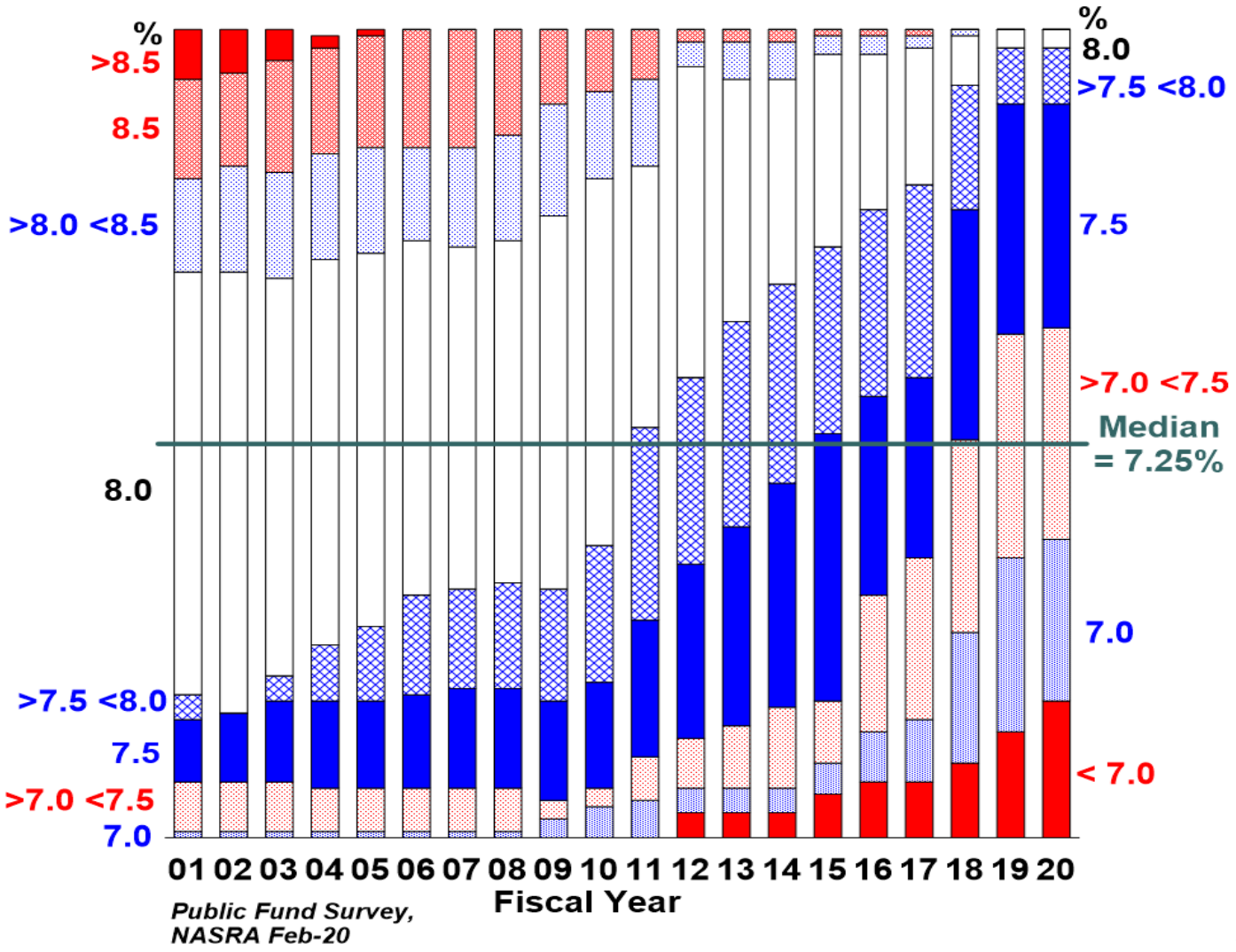
Setting the Investment Return Assumption – Comparison with Other Systems

- Comparison with other systems
  - National median is 7.50% but continues to trend down nationwide
    - National practice lags California!
  - 7.00% is the most common for California CERL systems
    - Twelve California systems at 7.00%
  - 7.25% currently used by ACERA and four other systems
    - Three systems, including ACERA, currently use 3.00% inflation
    - Two systems currently use 2.75% inflation but have separate contribution charges for administrative expenses
  - CalPERS and CalSTRS both approved reduction to 7.00%

Investment Return Assumption – Expected Return Assumptions for California Systems

System(s)	Assumption	Count
CalPERS	7.00%	
CalSTRS	7.00%	
University of California	6.75%	
1937 CERL Systems	7.25%	5
	7.00%	12
	6.75%	2
	6.50%	1
City Systems		
San Francisco	7.40%	
LACERS, LAFPP	7.00%	
LADWP	7.00%	
Fresno	7.00%	
San Jose	6.75%	
San Diego	6.50%	

Investment Return Assumption – Change in Distribution of Public Pension Investment Return Assumptions, FY 01 to FY 20



Impact of 50/50 Excess Earnings Allocation on Investment Return

- Disclosure provided for informational purposes only
  - Article 5.5 of the Statue appears to preclude the prefunding of the SRBR by using an assumption lower than the market earnings assumption
- Impact of 50/50 excess earnings allocation studied using a stochastic model
  - Recommend an increase in assumption to anticipate impact from 0.60% to 0.65%
  - Primarily as a result of increase in the portfolio's standard deviation since last review

Question?

Anticipated Impact on Valuation Results Modeled as of December 31, 2019 for Illustration

Summary of Cost Impact of Recommended Assumptions	
Impact on Employer	
Change due to inflation and investment return assumptions	1.58%
Change due to other assumption changes	0.88%
Total change in average employer rate	2.46%
Total estimated change in annual dollar amount (000s)	$27,447
Impact on Member	
Change due to inflation and investment return assumptions	0.28%
Change due to other assumption changes	0.27%
Total change in average member rate	0.55%
Total estimated change in annual dollar amount (000s)	$6,128
Impact on UAAL and Funded Percentage	
Change in UAAL	$318 million
Change in funded percentage	From 77.6% to 75.2%

Anticipated Impact on Valuation Results Modeled as of December 31, 2019 for Illustration

Assumption Change	Impact on Employer Contribution Rates	Impact on Member Contribution Rates	Impact on UAAL ($ millions)
Decrease due to changes in inflation and investment return assumptions	**1.58%**	**0.28%**	**$195**
Increase/(decrease) due to change in mortality	0.98%	0.20%	$139
Increase due to changes in all other demographic	(0.10%)	0.07%	($16)
Increase due to changes in other assumptions	**0.88%**	**0.27%**	**$123**
Total increase/(decrease) due to all assumption changes	**2.46%**	**0.55%**	**$318**

- Of the various assumption changes, the most significant cost impact (rate increase) for both General and Safety members is from inflation and investment return, followed by the change in the mortality assumptions

Anticipated Impact on Valuation Results Modeled as of December 31, 2019 for Illustration

Employer Contribution Rate Increases/(Decreases) (% of Payroll) (Estimated Annual Dollar Amounts in $000s)				
	Normal Cost	UAAL	Total	Annual Amount*
General (non-LARPD)	0.24%	1.70%	1.94%	$18,117
LARPD	0.29%	2.54%	2.83%	121
All Safety	1.63%	3.71%	5.34%	9,209
Combined	**0.45%**	**2.01%**	**2.46%**	**$27,447**

* Based on projected annual payroll as determined under each set of assumptions.

Anticipated Impact on Valuation Results Modeled as of December 31, 2019 for Illustration

Average Member Contribution Rate Increases/(Decreases) (% of Payroll) (Estimated Annual Dollar Amounts in $000s)		
	Total	Annual Amount*
General Tier 1	0.27%	$32
General Tier 2	0.52%	2,957
General Tier 3	0.68%	12
General Tier 4	0.33%	1,174
Safety Tier 1	0.28%	2
Safety Tier 2	0.93%	1,023
Safety Tier 2C	1.09%	33
Safety Tier 2D	1.02%	155
Safety Tier 4	1.76%	740
Combined	**0.55%**	**6,128**

* Based on projected annual payroll as determined under each set of assumptions.

Question?