Marin County Employees' Retirement Association

Results of Actuarial Audit

June 30, 2017 Actuarial Valuation
and 2014-2017 Experience Study

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Milliman

- Purpose: Review Cheiron’s actuarial work and confirm that the results of the valuation and the most recent experience study are reasonable.
- Scope:
  - Full independent replication of Actuarial Valuation (June 30, 2017)
  - Review of Experience Study (2014 – 2017)

- What you need to know
  - Overall results are good
    - Close match on liabilities and contribution rates (both member and employer)
    - Package of assumptions is reasonable
    - Recommended changes will not materially affect overall results
  - Recommendations
    - Revise the service death benefit calculations for active PEPRA members to correctly align with the Miscellaneous and Safety assumptions
    - Revise the assumed age factor used in the calculation of liabilities for current deferred vested members to correctly align with the updated assumed deferred retirement ages
    - Revise the calculation of liabilities for the active member reciprocal benefit to reflect updated assumed deferred retirement ages for PEPRA members
    - Add/modify disclosures in the valuation report

- Independent parallel valuation performed
  - Components
    - Data
    - Assumptions & methods
    - Assets
    - Benefits

- Reviewed data supplied by MCERA
  - Confirmed that all necessary information was included
  - Compared benefit amount versus actual benefit payments made
- Reviewed data used in Cheiron's valuation
  - Performed independent data editing
    - Checked individually and in aggregate
  - Conclusion
    - Data used by Cheiron in valuation is reasonable

	Cheiron	Milliman	Ratio Cheiron/Milliman
Active Members			
Total Number	2,685	2,685	100.0%
Average Age	46.8	46.8	100.0%
Average Service	10.6	10.6	100.0%
Average Compensation	$ 90,859	$ 90,917	99.9%
Retirees and Survivors			
Total Monthly Benefit (in $millions)	$ 134.79	$ 135.09	99.8%
Average Age	70.1	70.3	99.8%

- Replication valuation results
  - Close match in total
    - A few differences by benefit type identified
  - Good match by employer and plan – see Appendix A of Milliman report
  - Actuarial Accrued Liability shown in millions of dollars

	AAL ($millions)		Ratio
	Cheiron	Milliman	Cheiron/Milliman
County of Marin	$ 1,981.7	$ 1,980.2	100.1%
Novato FPD	183.3	184.8	99.2%
City of San Rafael	557.6	558.2	99.9%
Total AAL	**$ 2,722.6**	**$ 2,723.2**	**100.0%**

- Close match on total Normal Cost rate

- Current inactive vested members
  - Cheiron's estimate of future retirement benefit was too low for some inactive members due to incorrect age factor used
    - Age factors used were based on assumed retirement age from prior assumptions
- Current active members
  - Service death benefit assumption was switched for General and Miscellaneous
  - Cheiron's estimate of future retirement benefit was too low for some active members assumed to terminate in the future with reciprocity
    - Projection of reciprocal compensation based on assumed retirement age from prior assumptions
  - Present value of benefits in millions of dollars

	Cheiron	Milliman	Ratio Cheiron/Milliman
Service Retirement	$ 1,224.2	$ 1,241.0	98.6%
Deferred Vested & Refund	43.0	44.7	96.3%
Disability	73.6	73.6	100.1%
Death from Active Status	14.5	13.6	106.1%
Total Active PVB	**$ 1,355.3**	**$ 1,372.9**	**98.7%**

- Independently calculated non-PEPRA rates by age
  - Basic rates based on statutory formula
  - COLA based on equal sharing by employers and members
  - Milliman matched Cheiron calculations well
  - One technical suggestion for consideration with next experience study dealing with COLA timing
- PEPRA rates are half of the normal cost rate as mandated by PEPRA
  - Our estimates are close (within about 2% of Cheiron's)
  - Small differences in Milliman and Cheiron calculations due to issue with service death assumption
- Administrative load included

- Market value of assets used
- Assets allocated to sub-groups within each employer group
  - Different procedures are in place for each employer
  - Different procedures do not result in a shift of assets between employers
  - Milliman confirmed allocation calculations
- Assets used in valuation are reasonable

- Entry Age Actuarial Cost Method
  - Our usual recommendation
- Employer Contribution Rate
  - Normal Cost + layered amortization of UAAL
    - Amortization period for new layers is 24 years (22 years for assumption changes) with a ramp-up and ramp-down of rates
  - Consider change to how first year payroll is projected in amortization
  - Funding Adequacy
    - Reasonable balance of progress toward paying off UAAL and mitigating employer contribution rate volatility
    - Most public systems use asset smoothing. Effect similar to ramp-up and ramp-down method used by MCERA for asset experience. MCERA method also phases in demographic experience and assumption changes.

- Independently calculated employer contribution rates based on MCERA’s funding policy
  - Milliman and Cheiron rates are close

	Employer Contribution Rate		Ratio
	Cheiron	Milliman	Cheiron/Milliman
County of Marin	25.32%	25.26%	100.3%
Novato FPD	49.05%	48.83%	100.4%
City of San Rafael	61.76%	61.51%	100.4%

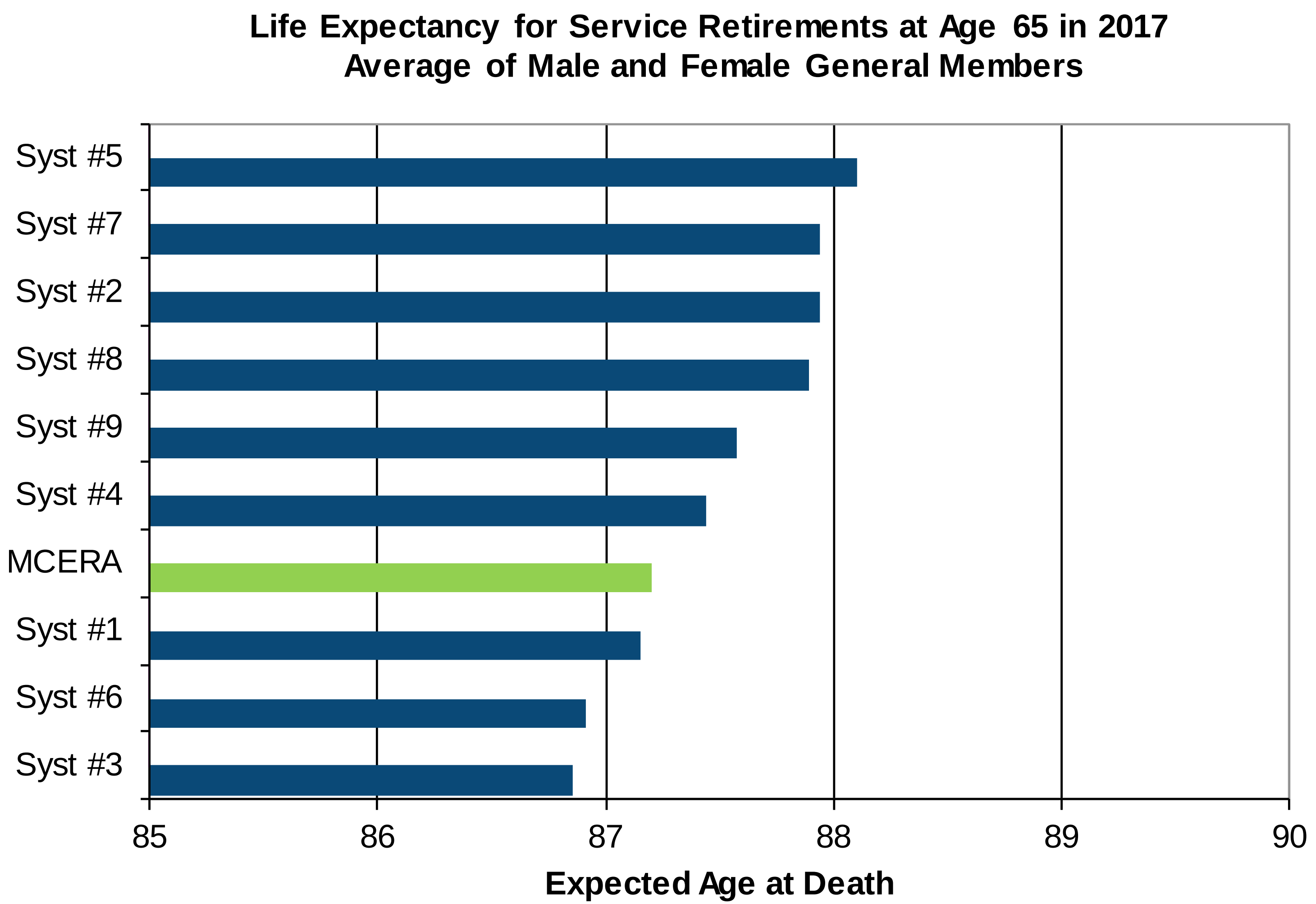
- Economic Assumptions
  - Set based on global forecasts
- Demographic assumptions
  - Set based largely on MCERA’s recent experience

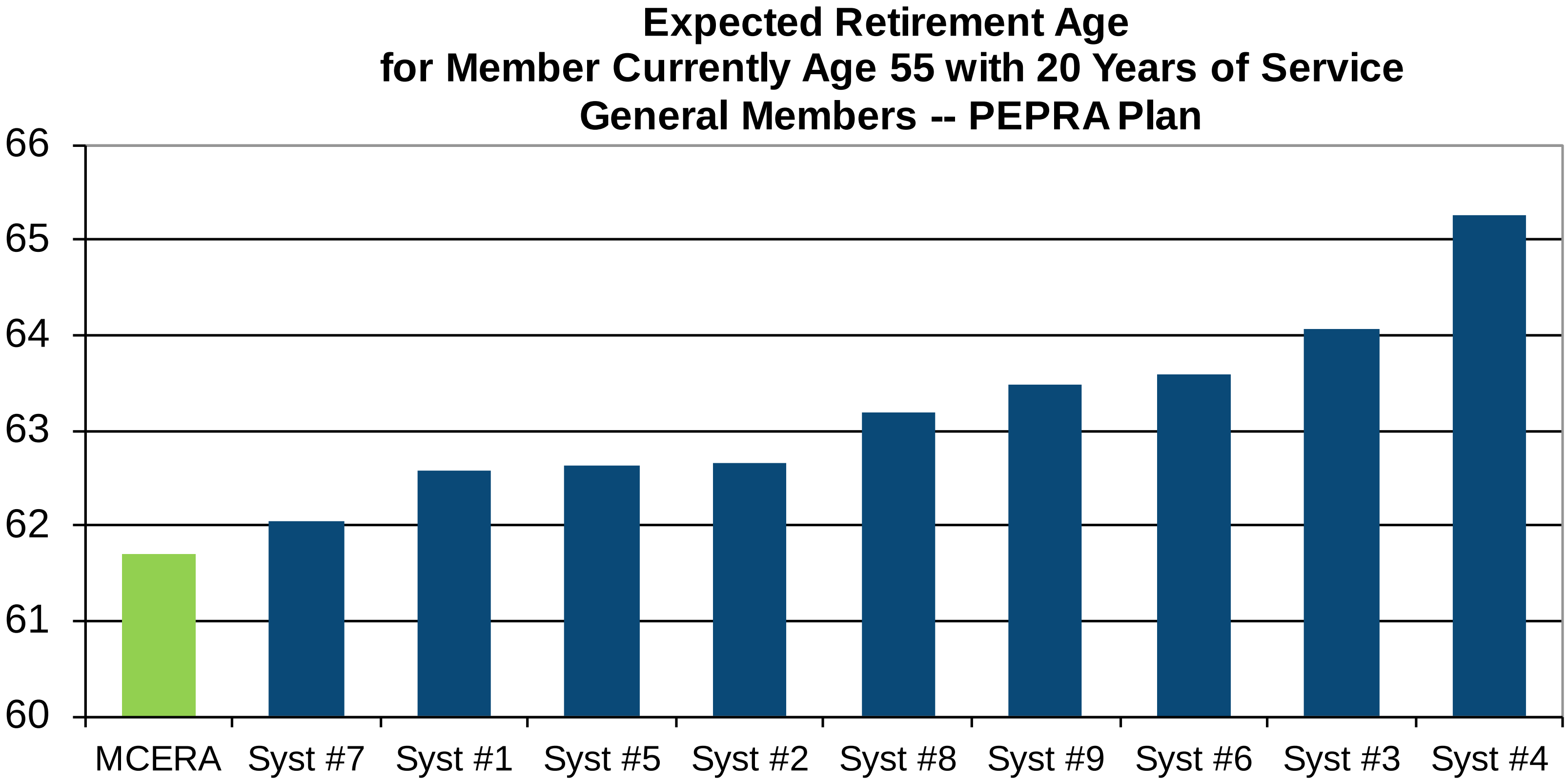
- MCERA lowered 3.00% assumption to 2.75% with Experience Study
- Investment consultants: Typically 2.5% or less
- Inflation-linked bonds: 2.1% in October 2018
- Social Security Intermediate Estimate: 2.6%
- Assumptions of Peer Systems
  - 3.0% was the most common for public systems at the time of the Experience Study
  - Downward Trend – most common assumption is now 2.75%
- We believe that the move to 2.75% was reasonable and that the assumption continues to be reasonable for use with the June 30, 2018 valuation

- Future salary increases made up of two components:
  1. General wage Increases
  2. Individual increases due to promotion & longevity (discussed later)
- General wage increases made up of two components:
  1. Consumer Price Index
  2. Real wage inflation
- New assumption is 3.00%; 2.75% for CPI and 0.25% for real wage inflation
- Historical data varies widely depending upon source, lookback period, and methodology
- Trustees Report for Social Security Administration (1.20% real for intermediate assumption)
- 0.25% is on the lower end, but we consider it reasonable
- 3% assumption used for both general wage increases and total payroll growth

- Assumption lowered to 7.00% nominal and 4.25% real
- Modeled expected return
  - Cheiron used MCERA asset allocation and the capital market assumptions of several different investment consultants
  - Forecasts support move to 4.25% real assumption
  - 7.00% is lower than the majority of public retirement systems, but there is a significant downward trend in return assumptions
    - 7.0% is common among California retirement systems, including CalSTRS
- Bottom Line
  - We believe that the move to 7.00% was reasonable and that the assumption continues to be reasonable for use with the June 30, 2018 valuation

- Assumptions reasonable and in compliance with Actuarial Standard of Practice No. 35
- Consider separate retirement rates for PEPRA plans to reflect later expected retirement
  - Prior Cheiron analysis has shown that assuming later retirement ages has little impact on PEPRA normal cost rates
- Mortality weighted by benefit amounts
  - Our preferred method
- Actual longevity over prior period better than assumption
  - While sample size is small for this type of assumption, should continue to be monitored
- Consider including assumption for future sick leave conversion for PEPRA members
  - Cheiron has indicated that they have already completed a preliminary analysis of this assumption


Life Expectancy for Service Retirements at Age 65 in 2017
Average of Male and Female General Members
Syst #5
Syst #7
Syst #2
Syst #8
Syst #9
Syst #4
MCERA
Syst #1
Syst #6
Syst #3
85
86
87
88
89
90
Expected Age at Death


Expected Retirement Age
for Member Currently Age 55 with 20 Years of Service
General Members -- PEPRA Plan
66
65
64
63
62
61
60
MCERA
Syst #7
Syst #1
Syst #5
Syst #2
Syst #8
Syst #9
Syst #6
Syst #3
Syst #4

- Cheiron reports satisfy relevant Actuarial Standards of Practice regarding actuarial communication
- Some descriptions of actuarial assumptions and methods are either missing or misstated
  - Recommended changes are for better disclosure; no impact on the calculations

- No recommended changes with a material impact on the overall results
- Recommended changes
  - Application of service death benefit assumption
  - Calculation of estimated retirement benefits for some inactive vested members
  - Calculation of estimated retirement benefits for active members assumed to leave active service and work for a reciprocal employer
  - Disclosures in valuation report
- Consider for the future:
  - Addition of assumption for sick leave conversion for PEPRA members
  - Adjustment to first year payroll used in UAAL contribution rate
  - Review of COLA timing used in calculation of COLA portion of member rates
  - Addition of separate retirement rates for PEPRA members

- Summary
  - The valuation reasonably represents the actuarial condition of the fund based on a package of assumptions and methods that are reasonable
  - Cheiron's recommended member and employer contribution rates are appropriate for funding MCERA
- Questions?

Thank you

This presentation is based on the data, methods, assumptions and plan provisions described in our actuarial audit report dated November 20, 2018. The statements of reliance and limitations on the use of this material is reflected in the actuarial report and still apply to this presentation.

These statements include reliance on data provided, on actuarial certification, and the purpose of the report.

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