

Pension Funding Council

Actuarial Audit

July 28, 2014 Meeting

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Purpose & Scope

- **Purpose:** Review OSA's work and confirm that the results of the valuation and the most recent experience study are reasonable.
- **Scope:**
 - Full independent replication of June 30, 2013 Actuarial Valuation
 - Full independent review of Experience Study



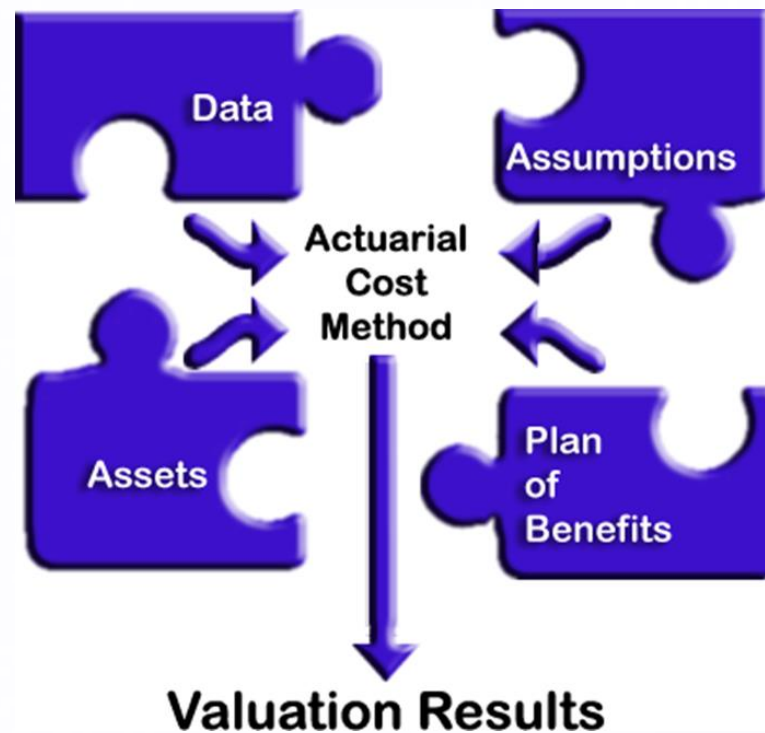
Bottom Line

- What you need to know
 - OSA's actuarial work is reasonable and appropriate
 - Good match on liabilities and contribution rates
 - Package of assumptions is reasonable
 - Recommendations
 - No changes needed to 2013 valuation
 - Recommendations for changes in methodology for future valuations and experience studies



Actuarial Valuation

We will review the process starting with results and going backwards.



Parallel Valuation Results

Present Value of All Future Benefits

- Good match by Benefit Type

(in \$Millions)	All Systems in Aggregate		
	OSA	Milliman	O / M Ratio
Present Value All Future Benefits			
Retirement	\$46,939.4	\$46,649.7	100.6%
Termination	1,865.5	1,889.7	98.7%
Death	896.8	908.7	98.7%
Disability	<u>517.2</u>	<u>514.4</u>	<u>100.5%</u>
Total Actives	\$50,218.9	\$49,962.5	100.5%
Terminated Vested	\$3,614.0	\$3,596.5	100.5%
Terminated Not Vested	<u>269.7</u>	<u>269.8</u>	<u>100.0%</u>
Total Inactive, not in Payment	\$3,883.7	\$3,866.4	100.4%
Retired	\$30,456.6	\$30,515.3	99.8%
Disabled	2,310.2	2,316.0	99.7%
Survivor	1,946.0	1,954.4	99.6%
LOP Liability	<u>72.8</u>	<u>72.9</u>	<u>99.9%</u>
Total Annuitants	\$34,785.6	\$34,858.6	99.8%
Total Members	\$88,888.2	\$88,687.5	100.2%

Parallel Valuation Results

Present Value of All Future Benefits

- Good match by System

	OSA	Milliman	Ratio OSA/Milliman
Present Value All Future Benefits (in \$Millions)			
PERS 1	\$ 13,012.2	\$ 12,957.2	100.4%
PERS 2/3	33,403.9	33,192.7	100.6%
TRS 1	9,490.9	9,532.3	99.6%
TRS 2/3	12,025.1	12,063.1	99.7%
SERS 2/3	4,494.9	4,495.5	100.0%
PSERS 2	595.3	590.8	100.8%
LEOFF 1	4,420.3	4,430.4	99.8%
LEOFF 2	10,313.8	10,295.7	100.2%
WSPRS	1,131.8	1,129.8	100.2%
Total PVB	\$ 88,888.2	\$ 88,687.5	100.2%

Parallel Valuation Results

Projected Unit Credit Accrued Liability (PUC AL)

- PUC AL is used for disclosing Funded Ratios
- Good match

	OSA	Milliman	Ratio OSA/Milliman
Projected Unit Credit Accrued Liability (PUC AL) (in \$Millions)			
PERS 1	\$ 12,884.3	\$ 12,614.8	102.1%
PERS 2/3	23,797.8	23,733.7	100.3%
TRS 1	9,448.7	9,431.7	100.2%
TRS 2/3	8,016.4	7,942.1	100.9%
SERS 2/3	3,272.7	3,272.5	100.0%
PSERS 2	180.3	182.1	99.0%
LEOFF 1	4,409.5	4,384.1	100.6%
LEOFF 2	6,859.3	6,841.6	100.3%
WSPRS	959.0	954.2	100.5%
Total PUC AL	\$ 69,828.1	\$ 69,356.8	100.7%

Contribution Rates

- Good match

- Exact match when we use OSA liability and asset calculations
- Rates below are based on Milliman liability and asset calculations

	OSA	Milliman	Difference OSA - Milliman
Employer Contribution Rates (Percent of Member Pay)			
PERS 1	5.18%	5.12%	0.06%
PERS 2/3	7.11%	7.04%	0.07%
TRS 1	6.91%	7.02%	-0.11%
TRS 2/3	7.56%	7.70%	-0.14%
SERS 2/3	7.70%	7.69%	0.01%
PSERS 2	6.89%	6.88%	0.01%
WSPRS	8.79%	8.43%	0.36%



Contribution Rates

- Why are OSA's WSPRS Rates larger than Milliman?
- All factors worked in the same direction
 - Present Value of Future Benefits 0.2% larger
 - Calculation of Actuarial Assets 0.1% smaller
 - Present Value of Future Salaries 0.7% smaller
 - 7.19% employee maximum shifted 0.14% to the employer

	OSA	Milliman	Comparison OSA to Milliman
WSPRS Contribution Rate Calculation (in \$Millions)			<u>Ratios</u>
a. Present Value All Future Benefits	1,131.8	1,129.8	100.2%
b. Actuarial Value of Assets	-1,009.4	-1,010.1	99.9%
c. Balance for Improved Survivor Benefits	<u>-9.8</u>	<u>-9.8</u>	100.0%
d. Present Value Future Contributions	112.6	109.9	102.5%
e. Present Value of Future Salaries	767.8	773.1	99.3%
			<u>Differences</u>
f. Member Normal Cost = 50% of d / e	7.33%	7.11%	0.22%
g. Member Rate (7.19% Maximum) (Maximum described in RCW 41.45.0631)	7.19%	7.11%	0.08%
h. Employer Normal Cost = 50% of d / e	7.33%	7.11%	0.22%
i. Increase due to 7.19% Member Max.	0.14%	0.00%	0.14%
j. Rate to Amortize Survivor Benefits	<u>1.32%</u>	<u>1.32%</u>	0.00%
k. Employer Contribution Rate	8.79%	8.43%	0.36%



New Recommendations

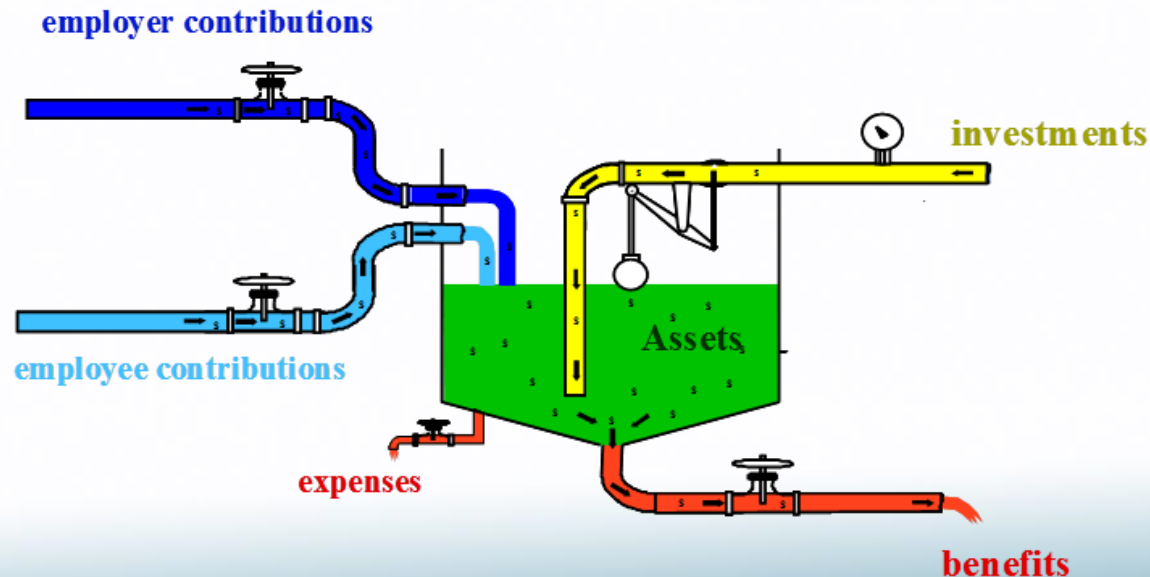
- Entry age is being calculated using current age minus truncated service (service rounded down).
 - Milliman believes it would be better to round to the nearest year of service instead of truncating (rounding down).
 - This would cause a small decrease in the EANC.
 - No cause for concern. Only used in minimum rates which do not apply in the 2013 valuation.
 - Milliman recommends changing method next year.
- Other changes concerning the methodology used to set assumptions
 - Do not cause material impacts
 - Detailed in audit report

Recommendations from Prior Audit

- OSA chose to disclose funded ratios with Projected Unit Credit method for one more year.
 - Will change with implementation of GASB 67/68 which requires use of Entry Age method
- Comment related to WSIB asset balances not quite matching DRS balances continues to apply.
- Some changes regarding the valuation of OPEB not made; however, we do not consider these material to the overall valuation of the system benefits
- All other material recommendations implemented

Aggregate Cost Method

- **Aggregate Normal Cost** equals the level % of projected pay to fund the difference between the present value of projected benefits and the actuarial value of assets.
 - All projected contributions go in one bucket, and are
 - spread evenly over the projected value of future salaries.
- Gains and losses cause the normal cost to go up and down.



Aggregate Cost Method

- Does not calculate liability independent of the assets, however OSA uses Projected Unit Credit to accomplish that.
- Conference of Consulting Actuaries Draft White Paper classifies Aggregate as “Acceptable” if supplemental calculations disclose additional information. If not, then “Acceptable with conditions.”
- All projected future contributions spread over projected salaries
 - Good for agency risk
(cost of benefits is not pushed into the future)
 - Excellent for demographic matching
(cost is matched to salaries of members earning benefits)

Conference of Consulting Actuaries (CCA)

Draft White Paper

- “Actuarial Funding Policies and Practices for Public Pension Plans”
- Response to the void left by GASB no longer specifying parameters for an ARC (Annual Required Contribution)
- Composed by a group of public plan actuaries from the major firms in public plan practice who met more than 24 times over two years.
- Sets out policy objectives and classifies practices for the three major components of funding policies (a) cost methods (b) asset methods and (c) amortization methods.
- Final scheduled for release July, 2014

Conference of Consulting Actuaries (CCA)

Draft White Paper *(continued)*

- Level Cost Allocation Model (LCAM)
- Classifications
 - LCAM Model practices
 - NOT “Best Practices”
 - Usually one practice most consistent with the Level Cost Alloc. Model
 - Acceptable Practices

“well established in practice and typically do not require additional analysis to demonstrate their consistency with general policy objectives.”
 - Acceptable with Conditions – require additional analysis
 - Non-recommended Practices

adopt only with acknowledgement of identified policy concerns or with understanding they reflect different policy objectives
 - Unacceptable Practices

Asset Method

- OSA Asset Method
 - Smooths losses based on size of gain or loss. Examples
 - If actual return within 1% of assumption – immediate recognition
 - If actual return more than 7% above or below assumption – 8 years
 - Must be inside 70% to 130% of Market Value Corridor
- OSA is almost inside of CCA Model Practice:
 - 5 or fewer years with 50% - 150% corridor, OR
 - 7 years or less with 60%/140% corridor
- OSA satisfies CCA Acceptable Practice:
 - 10 years or less with 70%/130% corridor
- Other systems
 - 5 year smoothing is most common
 - Unusual to consider the size of the gain or loss

Asset Method *(continued)*

- OSA Asset Method satisfies all CCA Policy Objectives:
 - Policy specifies all components of Asset Method
 - Unbiased relative to market
 - Does not selectively reset at market when market > actuarial
 - Unbiased relative to realized and unrealized gains and losses
 - Satisfies ASOP No. 44 (Actuarial Standard of Practice):
 - Likely to return to market value in a reasonable period, and
 - Likely to stay within a reasonable range of market.
 - Parameters reflect empirical experience from historical market volatility
 - Support the policy goal of demographic matching

Actuarial Value of Assets

- Data provided by WSIB and DRS
 - Totals and breakdown by Plan taken from DRS data
 - Monthly cash flows taken from WSIB data.
 - End of Year total market values do not perfectly match between the two sources
- Independent calculation by Milliman based on sources of data
- Asset method and calculations are reasonable



Actuarial Value of Assets (continued)

AVA (millions)			
	OSA	Milliman	Ratio OSA/Milliman
PERS			
Plan 1	\$ 8,053	\$ 8,052	100.0%
Plan 2/3 (DB)	\$ 24,335	\$ 24,333	100.0%
TRS			
Plan 1	\$ 6,717	\$ 6,716	100.0%
Plan 2/3 (DB)	\$ 8,406	\$ 8,405	100.0%
SERS			
Plan 2/3 (DB)	\$ 3,335	\$ 3,335	100.0%
PSERS			
Plan 2	\$ 224	\$ 224	100.0%
LEOFF			
Plan 1	\$ 5,516	\$ 5,516	100.0%
Plan 2	\$ 7,862	\$ 7,862	100.0%
WSPRS			
Plan 1 & 2	\$ 1,009	\$ 1,010	99.9%

Membership Data

- Reviewed data supplied by DRS
 - Reviewed for reasonableness
 - Confirmed that all necessary information was included
- Reviewed data used in OSA's valuation
 - Performed independent data editing
 - Edits made for outliers and salary adjustments made for members with less than one year of service.
 - Compared to preliminary participant data summary posted on OSA's website.
 - Conclusion
 - Data used by OSA in valuation looks very good.



Membership Data (continued)

All Plans			
	OSA	Milliman	Ratio OSA/Milliman
<i>Active Members</i>			
Total Number	291,345	291,345	100.0%
Total Salaries (millions)	\$ 16,525	\$ 16,525	100.0%
Average Age	47.7	47.7	100.0%
Average Service	12.4	12.4	100.0%
Average Projected Compensation	\$ 56,710	\$ 56,715	100.0%
<i>Retirees and Survivors</i>			
Total Number	150,145	150,140	100.0%
Average Monthly Pension	\$ 1,803	\$ 1,800	100.2%
Number of New Service Retirees	9,474	9,490	99.8%
Avg Monthly Pension for New Svc Retirees	\$ 1,792	\$ 1,786	100.4%
<i>Terminated Members</i>			
Total Number Vested	53,356	53,361	100.0%
Total Number Non-Vested	118,332	118,333	100.0%

Experience Study

- Importance of reasonable assumptions
- Assumption types
 - Demographic assumptions
 - Set based largely on recent experience
 - Economic Assumptions
 - Set based on global forecasts
 - Not studied this year. Comments are last in this presentation.



Mortality

- Two parts
 - Base table: What is the probability today of living another year?
 - Improvement scale: People are living longer. How much longer?
- Base table
 - Milliman has reviewed OSA's work and had multiple discussions.
 - OSA found members with larger benefits are living longer. Along with excluding non-retired lives, no significant changes to results, but benefit weighted method will be incorporated into future studies.
- Improvement scale
 - OSA is recommending Scale BB.
 - Milliman believes this is reasonable.
 - Society of Actuaries February 2014, MP-2014 Report states:
 - Scale BB was developed using 1950 – 2007 Social Security data.
 - Scale BB was tested to be consistent with two large public plans.

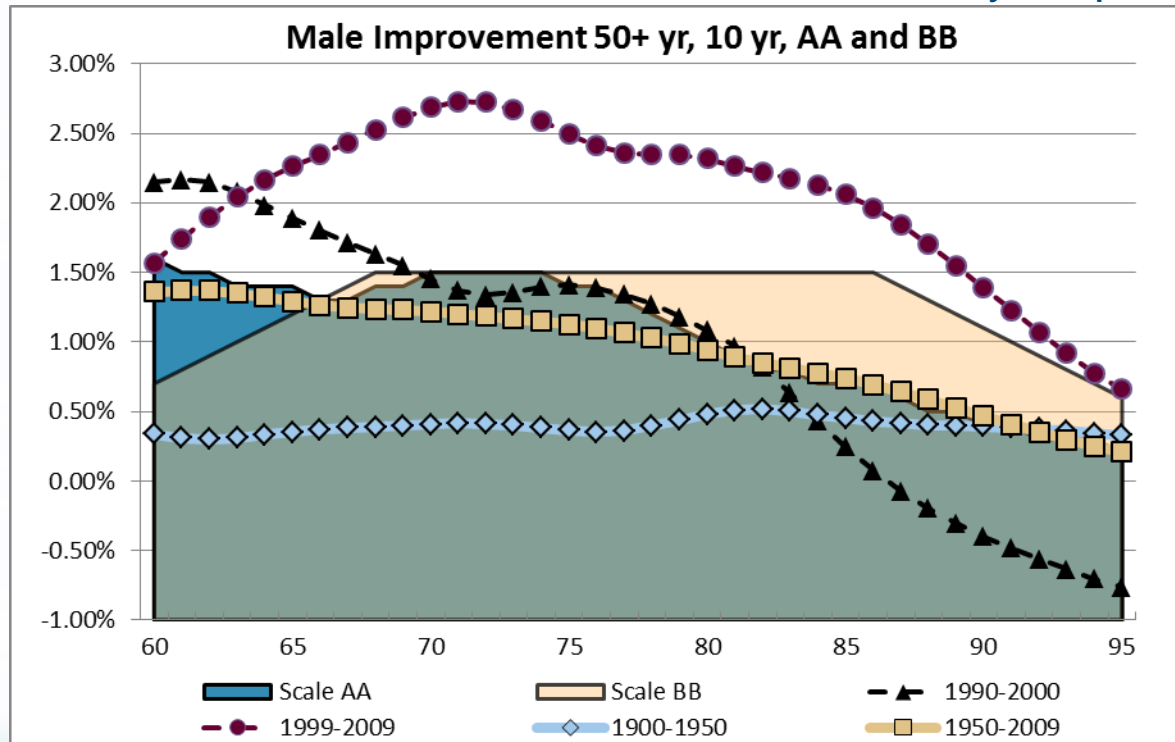
Future Mortality Improvement *(additional detail)*

- No one knows how rapidly mortality will improve
- There are many reasonable assumptions
- Further research shows
 - Compared to Milliman's calculations with Social Security Data Scale BB is generally:
 - lower than 1999 – 2009 improvement, and
 - higher than 1990 – 2000 improvement.
 - Scale BB is lower than CalPERS experience from 1997 - 2011
- Other Public Retirement Systems
 - Have generally not gone past Scale AA yet
 - Generational Mortality Projection
 - Half Scale AA generationally: Washington
 - Full Scale AA generationally: Oregon, Idaho, Seattle, Tacoma, Utah
 - Full Scale BB generationally: Wyoming
 - Differing Static Mortality Projections
 - CalPERS, CalSTRS, Montana PERS, Montana TRS, Colorado

(Private Plans generally use IRS mandated static projections for both IRS and accounting purposes.)

Male Comparison: Scales AA & BB to SSA Data*

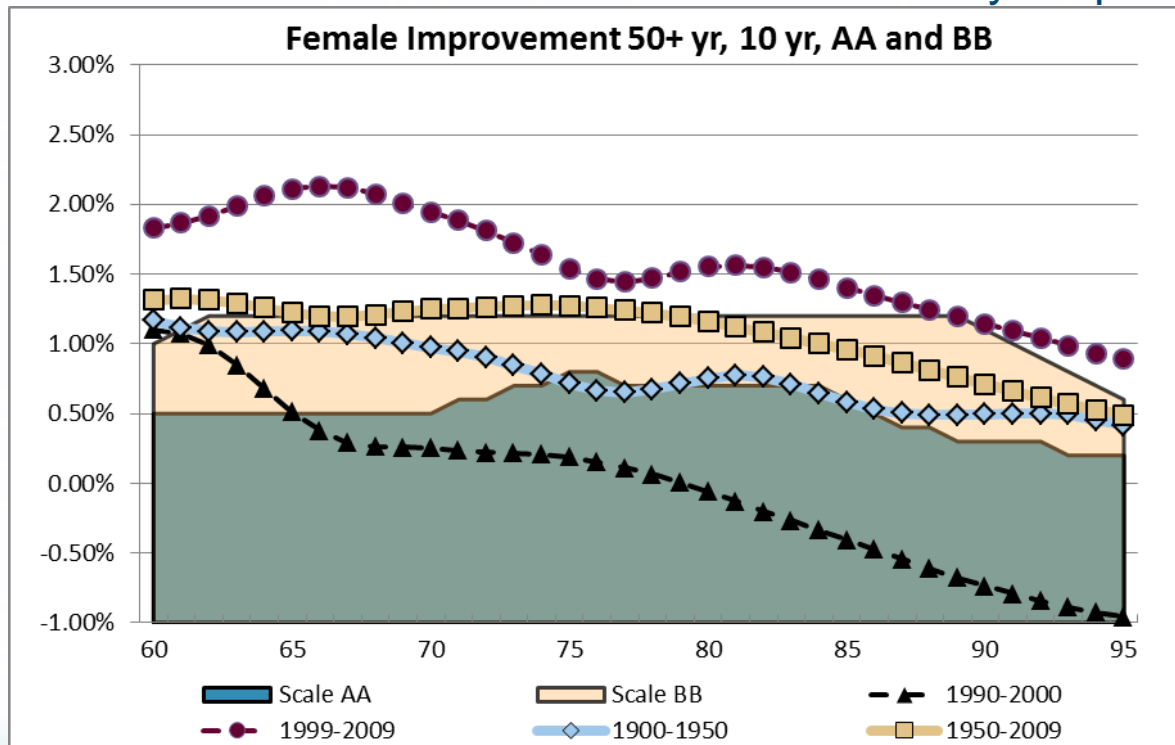
- Over ages 60 to 95, Male Scale BB is:
 - Generally higher than the 59 year average 1950 – 2009.
 - Lower than the most recent 10 year average 1999 – 2009.
 - Higher than the 10 year average from 1990 – 2000.
- Note significant difference between two consecutive 10 year periods



* Averages calculated by Milliman using Social Security Administration data.

Female Comparison: Scales AA & BB to SSA Data*

- Over ages 60 to 95, Female Scale BB is:
 - Generally close to the 59 year average 1950 – 2009.
 - Lower than the most recent 10 year average 1999 – 2009.
 - Higher than the 10 year average from 1990 – 2000.
- Note significant difference between two consecutive 10 year periods



* Averages calculated by Milliman using Social Security Administration data.

Salary Increases – Merit

- Actuaries use different approaches for developing this assumption.
- Subjectivity involved in determination of component for across-the-board productivity.
- Data from 1984 – 2009 used.
- Very minor adjustments from previous study.
- Recommendations are reasonable.

Service Retirement

- Data considered began in 1995.
- Data from 2008 – 2012 excluded from PERS, TRS, and SERS Plan 2/3 analysis, but included for Plan 1, LEOFF, and WSPRS.
 - Belief that period had lower retirements than can be expected long-term going forward due to Great Recession.
 - Better benefits for Plan 1, LEOFF meant less impact, particularly considering declining account balances for Plan 3.
 - Consideration should be given to how to use data at the next experience study.
 - If 2007 – 2012 period is lower than long-term expectations due to delaying retirement, next period may be higher.
- Generally, small, downward adjustments made to assumptions for all but WSPRS, which had small upward adjustments.
- Recommendations are reasonable.

Disability Retirement

- Benefit with low incidence for PERS, TRS, SERS, and PSERS
- Data from 1995 to 2012 used.
- Recommended generally lower assumptions to better match history.
- Recommendations are reasonable.

Termination

- Agree with service based approach.
- Agree with opinion that only minor changes required.
- Data from 1995 to 2010 used.
- Recommendations are reasonable.

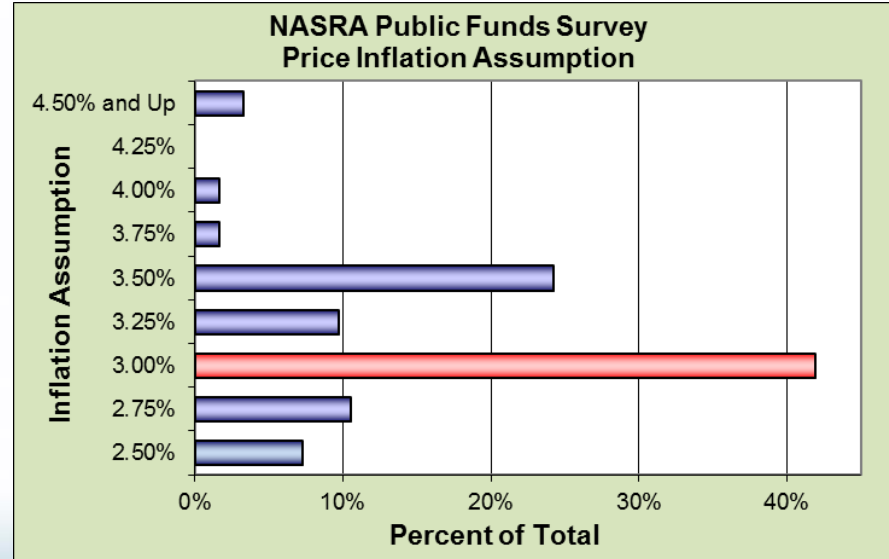
Other Assumptions

- Miscellaneous assumptions include:
 - Adjusted Final Compensation load
 - Spouse age difference
 - Military service credit load
 - Percentage taking annuities vs. refund of contributions
 - Minimum/Maximum/Default salaries and ages used for outliers and those with little service
 - Plan 3 Terminated Vested indexed benefit
 - TRS Salary Bonus

- Recommendations are reasonable.

Price Inflation and Wage Growth

- Price inflation assumption (3.00%) is reasonable
 - In line with historical averages.
 - Slightly higher than some forecasts.
 - Most common assumption for public systems.
- General wage growth (3.75%)
 - 0.75% higher than price inflation assumption
 - Reasonable

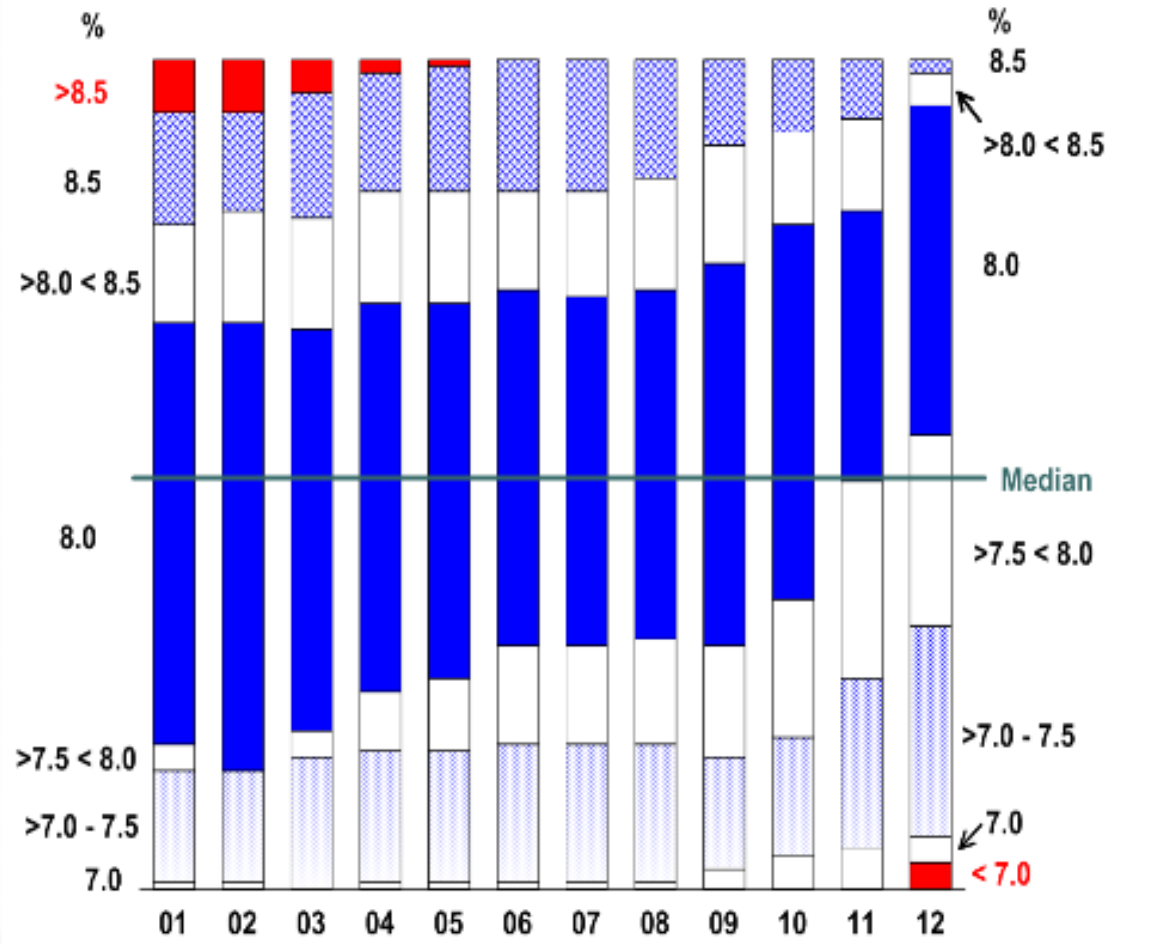


Investment Return

- Modeled expected return
 - Net of expenses
 - Used WSIB’s target asset allocation and Milliman’s capital market assumptions
 - We projected a long-term median return of 7.57% per year
 - Based on 2013 environment – slightly lower expectations now
 - Other capital market assumptions could be used, including WSIB’s from which OSA calculated a median 7.40% expectation.
- Revised actuarial standard may affect actuary’s future recommendations
 - Current standard requires 25% - 75% “best estimate range” (we calculate 5.9% - 9.3%)
 - Standard effective June 30, 2015 requires not significantly optimistic or pessimistic
- Bottom Line
 - The 7.50% recommendation is reasonable
 - The 7.80% and 7.70% assumptions are in the current standard’s, “best estimate range,” but may not satisfy the actuarial standard for the June 30, 2015 valuation.

Decreasing Investment Return Assumptions

Median is currently 7.75% based on NASRA's Public Fund Survey*:



* Results from November, 2013 Public Fund Survey shown above

Direct Rate Smoothing

- Some retirement systems phase-in the impact of assumption changes on contribution rates.
 - Instead of phasing in assumptions
 - Funding ratios are based on best estimate assumptions
 - Generally referred to as “Direct Rate Smoothing”
- Conference of Consulting Actuaries Draft White Paper
 - Says direct rate smoothing is preferable to assumption phase-in
 - Classifies “acceptable” practice as the shorter of: the time period to next scheduled assumption review, or five years.

Summary

- Recommendations
 - Modify calculation of entry age in future valuations
 - Implement some method changes pertaining to the setting of assumptions
 - Modifications to the valuation of OPEB benefits for future valuations (not material to the overall valuation of system benefits)
- Conclusion
 - The valuation accurately represents the actuarial condition of the System.
 - The assumptions and methods are reasonable.



Your Questions?



Caveats and Disclaimers

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

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

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