

LEOFF 2 Preliminary Actuarial Valuation Results

$$\int x^2 \sqrt{x^2 \pm a^2} dx = \frac{x}{8} (2x^2 \pm a^2) \sqrt{x^2 \pm a^2} - \frac{a^2}{8} \ln|x + \sqrt{x^2 \pm a^2}| + C$$

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Deputy State Actuary*

$\int \frac{\sqrt{x^2 - a^2}}{x} dx = \sqrt{x^2 - a^2} - a \sec^{-1} \frac{x}{a} + C$

$\int x^2 \sqrt{x^2 \pm a^2} dx = \frac{x}{8} (2x^2 \pm a^2) \sqrt{x^2 \pm a^2} - \frac{a^2}{8} \ln|x + \sqrt{x^2 \pm a^2}| + C$

$\int \frac{x^e}{\sqrt{x^2 \pm a^2}} dx = \frac{x}{2} \sqrt{x^2 \pm a^2} \mp \frac{a^2}{2} \ln|x + \sqrt{x^2 \pm a^2}| + C$

$\int \frac{\sqrt{x^2 \pm a^2}}{x^2} dx = \frac{\sqrt{x^2 \pm a^2}}{x} + \ln|x + \sqrt{x^2 \pm a^2}| + C$

$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \frac{x}{a^2} \sqrt{x^2 \pm a^2} + C$

$\int \frac{dx}{(x^2 \pm a^2)^{3/2}} = \frac{-x}{a^2 \sqrt{x^2 \pm a^2}} + C$

$\int (x^2 \pm a^2)^{3/2} dx = \frac{x}{8} (2x^2 \pm 5a^2) \sqrt{x^2 \pm a^2} + \frac{3a^4}{8} \ln|x + \sqrt{x^2 \pm a^2}| + C$

$x = p \cos \varphi$
 $y = p \sin \varphi$
 $|z| = p$
 $\varphi \in [0, 2\pi]$
 $-1 \leq x^2 + y^2 \leq -6y$
 $-4 \sin \varphi \leq p - 6 \sin \varphi$
 $2\pi - 6 \sin \varphi$
 $dp =$
 $\frac{d\varphi}{\sqrt{3}}$
 $-4 \sin \varphi$
 $V = \frac{\pi r^2 h}{3}$
 $4r^2 + h^2 = 60$



Today's Presentation

- Purpose of an actuarial valuation
- Highlights from preliminary 2015 actuarial valuation report
- Updated contribution rates
- Mortality assumptions
- Informational - no Board action needed today



Purpose Of An Actuarial Valuation

- Estimate future benefits to be paid from the plan
 - How much will they be
 - When will they be paid and for how long
- Calculate contribution rates to adequately fund future benefits
 - Update data, assets, and new legislation (if applicable)
- Check funding progress
 - Are we on track with our systematic actuarial funding plan?
- Certify the underlying data, assumptions, and methods are reasonable and conform with current actuarial standards of practice

Summary Of The 2015 Preliminary Valuation Results

- 4.93 percent return on market value of assets
 - July 1, 2014, through June 30, 2015
- Deferred asset gains of \$498 million
- Contribution rates under funding policy decreased
- Funded status decreased 2 percent from the 2014 valuation
 - Plan remains healthy
- Underlying data, assumptions, and methods remain reasonable



Change In Participant Data

Participant Data			
LEOFF 2	2014	2015	Difference
Number of Actives	16,773	17,019	246
Average Annual Salary	\$99,048	\$102,411	\$3,363
Average Attained Age	44	44	0
Average Service	15	15	0
Number of Annuitants	3,235	3,710	475

Update Asset Values

- Market Value of Assets (MVA) reported by WSIB
- Calculate 2015 asset gain (or loss) based on 7.5 percent expected return
- Develop Actuarial Value of Assets (AVA) by smoothing past and current asset gains (or losses)
 - Smooth gain (or loss) over a period up to eight years
 - AVA limited to 30 percent “corridor” around MVA
 - Smoothing method reduces contribution rate and funded status volatility



Change In Assets From Last Valuation

LEOFF 2			
	2014	2015 Preliminary	Difference
<i>(Dollars in Millions)</i>			
Market Value (MV)	\$9,251	\$9,833	\$582
Contributions Less Disbursements*	\$157	\$151	(\$6)
Investment Return	\$1,456	\$430	(\$1,026)
Return on Assets**	18.89%	4.93%	(13.96%)

*Includes transfers, restorations, and payables.

**Time-weighted return on market value of assets.

Actuarial Value Of Assets

Calculation of Actuarial Value of Assets				LEOFF 2
<i>(Dollars in Millions)</i>				
a.	Market Value at 6/30/2015*			\$9,818
b.	Deferred Gains and (Losses)			
	Plan Year Ending	Years Deferred	Years Remaining	
	6/30/2015	3	2	(177)
	6/30/2014	8	6	658
	6/30/2013	5	2	129
	6/30/2012	7	3	(167)
	6/30/2011	5	0	262
	6/30/2010	5	0	0
	6/30/2009	8	1	(207)
	Total Deferral			\$498
c.	Market Value less Deferral (a - b)			\$9,320
d.	70% of Market Value of Assets			\$6,873
e.	130% of Market Value of Assets			\$12,763
f.	Actuarial Value of Assets			\$9,320

Note: Totals may not agree due to rounding.

*Market Value of Assets reduced by a \$15.799 million payable to the LEOFF 2 Benefit Improvement Account due by 6/30/2016, discounted to 6/30/2015 at 7.5% (C 4 L 15).

Change In Liabilities From Last Valuation

LEOFF 2		
	2014	2015 Preliminary
<i>(Dollars in Millions)</i>		
Future Value of Fully Projected Benefits	\$89,832	\$95,769
Present Value of Fully Projected Benefits	\$11,205	\$12,152
Present Value of Accrued (Earned) Benefits*	\$8,069	\$8,838
Valuation Interest Rate	7.50%	7.50%

*Calculated using Entry Age Normal (EAN) cost method.

Funded Status

- Represents a measure of plan health
- Comparison of plan assets to today's value of earned pensions
 - Point-in-time measurement
- A funded status of at least 100 percent means a plan has at least \$1 in assets for each \$1 of earned pension liability
 - On track with systematic actuarial funding plan
- Plan more than 100 percent funded not necessarily over funded and may require on-going contributions



Funded Status Declined From Last Report

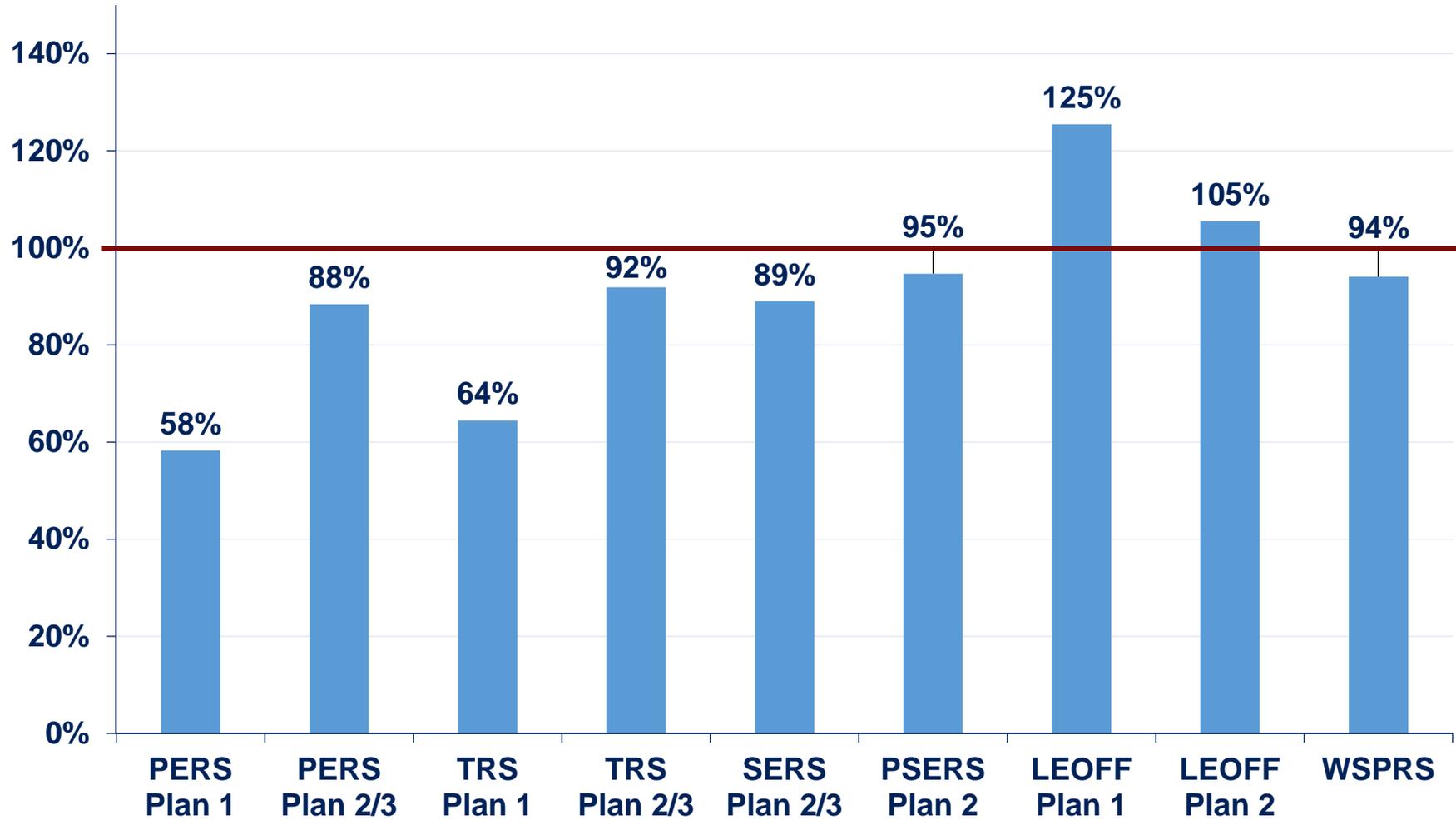
Funded Status at June 30		
(Dollars in Millions)	2014	2015
a. Accrued Liability*	\$8,069	\$8,838
b. Market Value of Assets**	9,251	9,818
c. Deferred Gains/(Losses)	613	498
d. Actuarial Value of Assets (b-c)	8,638	9,320
e. Unfunded Liability (a-d)	(\$569)	(\$482)
f. Funded Ratio (d/a)	107%	105%

Note: Totals may not agree due to rounding.

*Liabilities valued using Entry Age Normal cost method.

**2015 MVA reduced by \$15.799 million payable to the LEOFF 2 Benefit Improvement Account by 6/30/2016, discounted to 6/30/2015 at 7.5% (C 4 L 15).

Funded Status Below 100 Percent For Most Plans



PERS 1 And TRS 1 UAAL At June 30, 2015

Funded Status on an Actuarial Value Basis*										
(Dollars in Millions)	PERS		TRS		SERS	PSERS	LEOFF		WSPRS	Total
	Plan 1	Plan 2/3	Plan 1	Plan 2/3	Plan 2/3	Plan 2	Plan 1	Plan 2		
Accrued Liability	\$12,553	\$32,008	\$9,107	\$10,831	\$4,381	\$357	\$4,307	\$8,838	\$1,134	\$83,518
Valuation Assets	\$7,315	\$28,292	\$5,870	\$9,953	\$3,901	\$338	\$5,404	\$9,320	\$1,067	\$71,460
Unfunded Liability	\$5,239	\$3,715	\$3,237	\$879	\$481	\$19	(\$1,097)	(\$482)	\$67	\$12,058
Funded Ratio										
2015	58%	88%	64%	92%	89%	95%	125%	105%	94%	86%
2014	61%	90%	69%	94%	91%	96%	127%	107%	100%	87%

Note: Totals may not agree due to rounding.

*Liabilities valued using the EAN cost method at an interest rate of 7.7% (7.5% for LEOFF 2). All assets have been valued under the actuarial asset method.

Funded Status With Different Interest Rate Assumption

Funded Status at a 1% Lower Interest Rate Assumption*	
<i>(Dollars in Millions)</i>	
LEOFF Plan 2	
Accrued Liability	\$10,299
Valuation Assets	\$9,320
Unfunded Liability	\$979
Funded Ratio	
2015	90%
2014	92%

Funded Status at a 1% Higher Interest Rate Assumption*	
<i>(Dollars in Millions)</i>	
LEOFF Plan 2	
Accrued Liability	\$7,649
Valuation Assets	\$9,320
Unfunded Liability	(\$1,671)
Funded Ratio	
2015	122%
2014	124%

Note: Totals may not agree due to rounding.

*Liabilities valued using the EAN cost method at an interest rate of 6.5% and 8.5%. All assets have been valued under the actuarial asset method.

Preliminary Contribution Rates

- Concurrent outside audit in progress
 - Results may change
 - Final results expected in July
- Contribution rate-setting valuation
 - Board has adopted rates through June 30, 2019
 - Board can adopt new rates for 2017-19 Biennium



Preliminary 2017-19 Contribution Rates

Contribution Rates				
	2015-19	2017-19 Preliminary Contribution Rates		
	Adopted Rates*	Aggregate	90% EANC**	100% EANC**
Member	8.41%	7.46%	7.88%	8.75%
Employer***	5.05%	4.48%	4.73%	5.25%
State	3.36%	2.98%	3.15%	3.50%

*2017-19 rates increase to 100% EANC from 2013 AVR (8.85% Member, 5.31% Employer, 3.54% State).

**Normal cost rate under the Entry Age Normal cost method.

***Excludes current administrative expense rate of 0.18%.

Additional References

- Supporting exhibits available on OSA website
 - http://osa.leg.wa.gov/Actuarial_Services/Publications/Valuations.htm
- Staff at OSA
- Full and final actuarial valuation report available late September

Mortality Assumptions

- Background and history
- Developments since last demographic experience study



Mortality Improvement And Projection Scales

- Long history of continued improvement in lifespans and most experts expect the trend to continue
 - See June 2014 OSA presentation to the Board and OSA's last demographic experience study for further details
- Actuaries model these improvements by applying Mortality Projection Scales to current mortality tables
- Projection scales available from the Society of Actuaries (SOA)
 - Scale AA
 - Scale BB
 - MP-2014
 - MP-2015
- Represent rates of improvement (decreases) in future mortality rates
 - Separate rates by gender

Development And History Of Current Mortality Improvement Assumptions

- Not a new subject for Washington State
- Scale AA included in 2001-2006 Experience Study
 - 50 percent of Scale AA proposed in 2008
 - LEOFF 2 Board adopted 50 percent of Scale AA for 2009-2011 contribution rates
- Scale AA reviewed in 2007-2012 Experience Study
 - 100 percent of Scale BB proposed in 2014
 - LEOFF 2 Board adopted 100 percent of Scale BB for 2015-2017 contribution rates



Developments Since Last Demographic Experience Study

- SOA finalized MP-2014
 - Intended to replace Scale BB
 - MP-2014 was not final at our last demographic experience study
- SOA then released MP-2015 and announced plans to update the scale each year
 - MP-2015 represents the most current projection scale available
- Impact of moving from Scale BB to MP-2015
 - Less than a one percent initial drop in funded status
 - Estimated 2017-19 State budget impact of \$0.4 million (\$0.9 million total employer)
- Study on public plan mortality experience underway and may take several years for the final results to be available

OSA Thoughts On Mortality Assumptions

- Use of Scale BB reasonable and appropriate
- The use of MP-2015 would also be reasonable and appropriate
- Annual updates to long-term assumptions appear inconsistent with the nature and application of the assumptions
 - However, annual reviews required and ensure on-going reasonability of assumptions
- Additional information and insights will be gained when the results of the public plan mortality study become available
- OSA will continue to monitor developments and include in future experience studies and analysis



Questions

