

# State of Washington LEOFF Plan 2 Retirement Board 2009 Actuarial Valuation Audit



July 28, 2010  
Bill Hallmark, ASA, FCA, EA  
Anne Glaser, EA



# Topics for Discussion

- Key Findings
- Actuarial Audit Valuation Process
- Disability Experience Study
- Data Review
- Replication of Liabilities and Contribution Rates
- Deterministic Projections
- Questions



# Key Findings

- No material difference in data review or calculations of plan liabilities and contribution rates
- Disability experience is significantly different than current assumption - the proposed assumption is reasonable, but could move closer to actual experience
- Consider disclosing funded status on Entry Age Normal basis instead of Projected Unit Credit
- Deterministic projections indicate that amortization method for LEOFF Plan 1 liabilities may need to be changed as end date draws near
- Minor differences discussed in full report

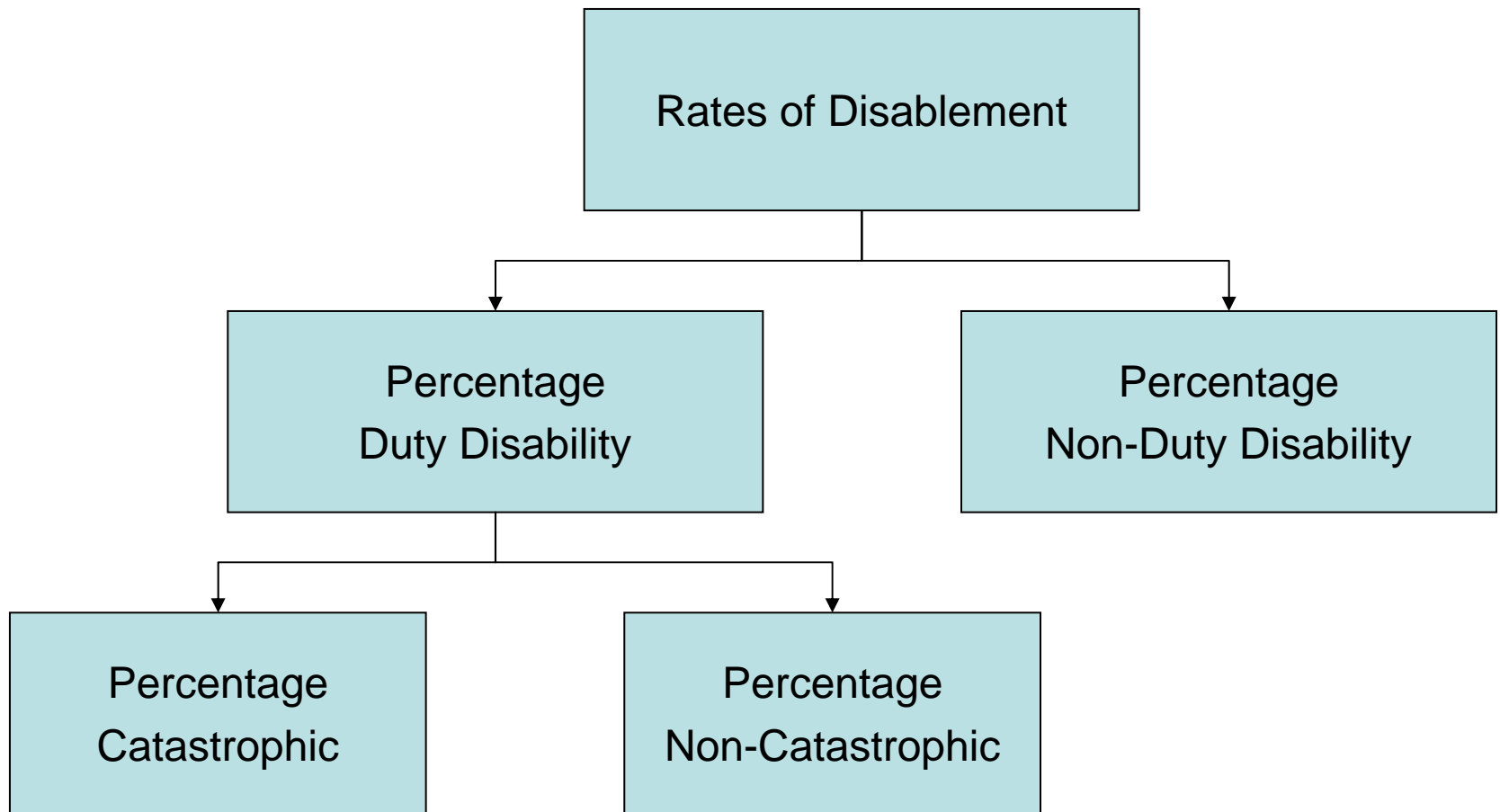


# Actuarial Valuation Audit Process

- **Disability Experience Study** – Review the study to ensure recommended change is appropriate
- **Data review** -- Comparison of raw data provided by DRS to final data used by the OSA in the valuation
- **Replication of liabilities** – Independently value the plan using the census data and assumptions of the OSA to verify the calculation of the value of benefits
- **Replication of contribution rates** – Independently produce the contribution rates based on the value of liabilities and the value of assets
- **Deterministic projections** – Use multiple economic scenarios to stress test the plan methods to ensure they produce a reasonable pattern of funding and funded status



# Disability Experience Study





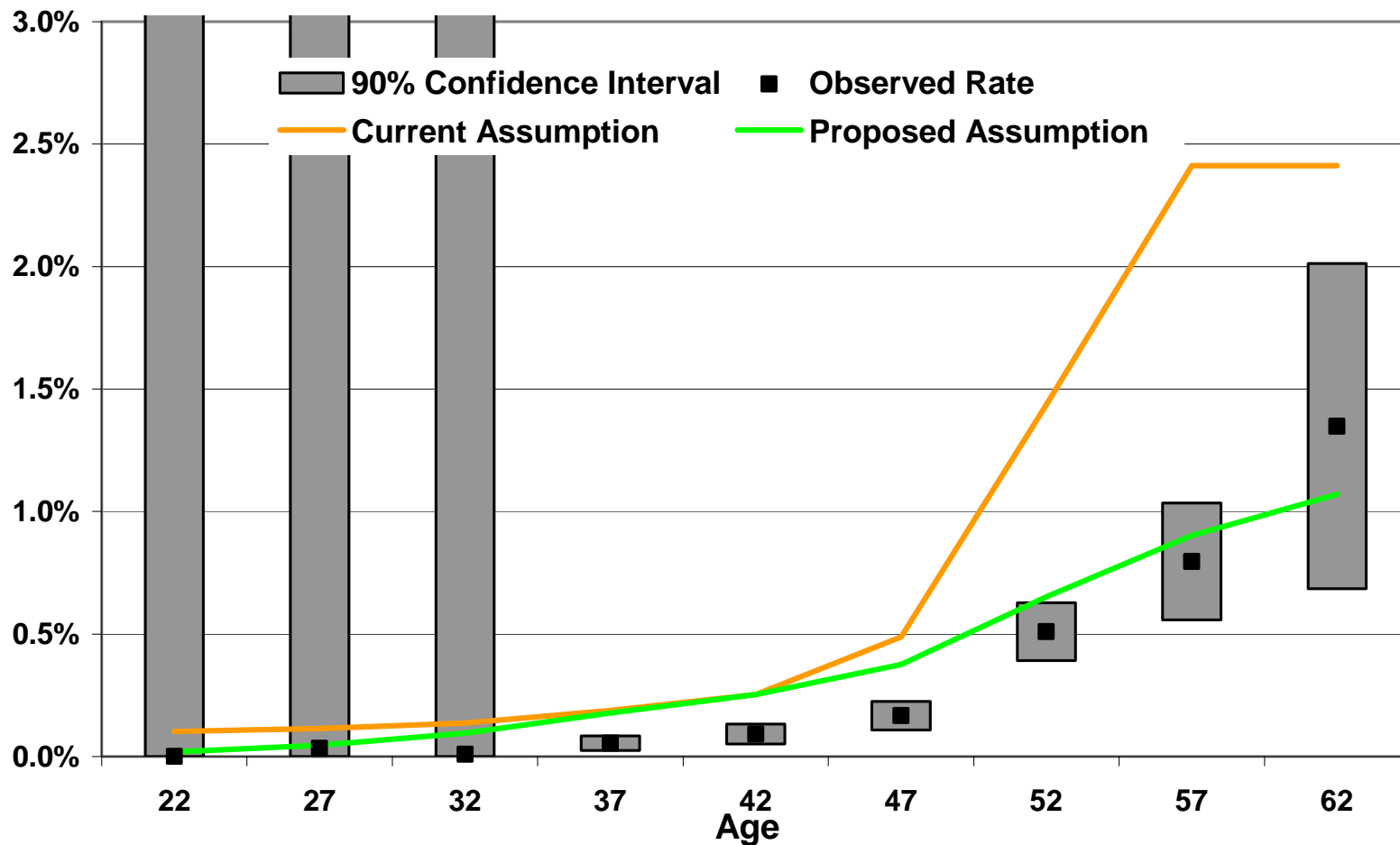
# Disability Experience Study

- Use confidence intervals to
  - Assess credibility of data
  - Appropriateness of assumption
- 90% confidence interval shows the range around the observed rate in which the “true rate” falls 90% of the time
  - Robust data → narrow confidence interval
  - Sparse data → wide confidence interval
- Only reflects historical experience
- Generally change assumptions consistently outside the 90% confidence interval
- Ideal Actual / Expected (A/E) Ratio is near 1.0



# Disability Experience Study

## Disability Rates - LEOFF Members



Current A/E Ratio: 0.339

Proposed A/E Ratio: 0.579



# Disability Experience Study

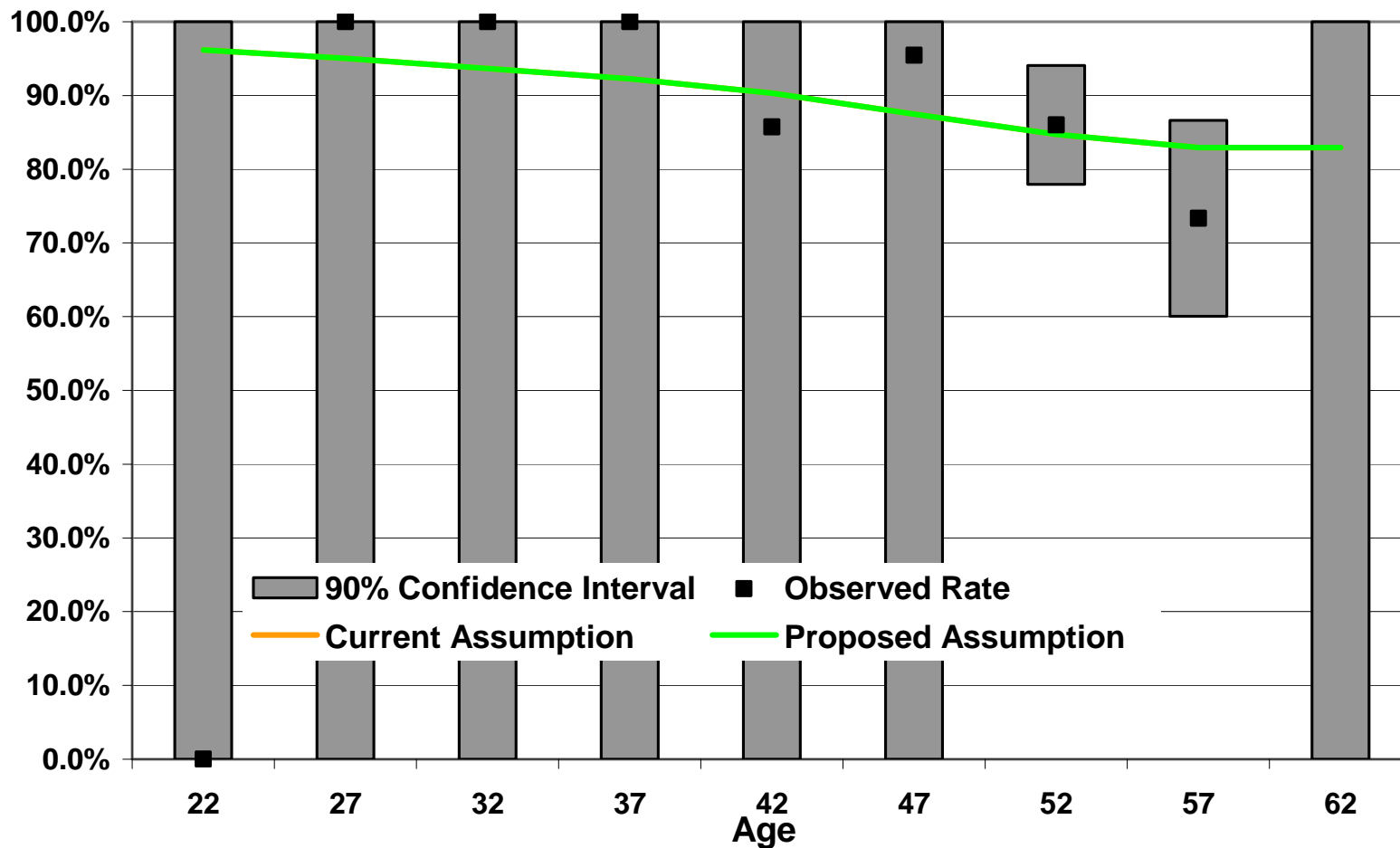
- Normally give some deference to current assumption because it is based on prior experience
- Current disability assumption is not based on LEOFF experience
- According to OSA, higher rates of disability result in lower cost due to mortality assumption for disabled members (Not confirmed yet)
- Proposed assumption is reasonable, but could move closer to actual experience. Re-evaluate when more data is available





# Disability Experience Study

## Duty % Rates - LEOFF Members



Current A/E Ratio: 1.008

Proposed A/E Ratio: 1.008



# Disability Experience Study

- Current assumption for percentage duty-related is reasonable
- For catastrophic assumption, the data is very sparse with only 4 catastrophic disabilities out of 67 duty disabilities (~6%)
- We concur, however, that reducing the assumption from 18% to 12% is appropriate



# Data Review

LEOFF Plan 2					
	Raw Data	Apply Defaults	Clean Data	Effect of Defaults	Ratio of Clean / Raw
<b>Active Members</b>					
Count	16,951	16,951	16,951	0.0%	0.0%
Total Salaries (millior \$	1,417.0	\$ 1,442.0	\$ 1,442.5	1.8%	1.8%
Averages					
Age	41.60	41.60	41.59	0.0%	0.0%
Service	12.69	12.69	12.69	0.0%	0.0%
Salary	\$ 83,591	\$ 85,066	\$ 85,097	1.8%	1.8%
<b>Retired Members</b>					
Count	1,128		1,128		0.0%
Average Age	58.58		59.78		2.0%
Average Benefit	\$ 2,389		\$ 2,340		-2.0%
<b>Disabled Members</b>					
Count	171		171		0.0%
Average Age	54.12		55.13		1.9%
Average Benefit	\$ 2,021		\$ 2,021		0.0%
<b>Beneficiaries</b>					
Count	68		68		0.0%
Average Age	54.81		54.99		0.3%
Average Benefit	\$ 1,713		\$ 1,713		0.0%



# Replication of Liabilities

Present Value of Future Benefits	LEOFF 2		
	OSA	Cheiron	Ratio
<b>Actives</b>			
Death	\$ 111.1	\$ 107.3	96.6%
Disability	\$ 355.8	\$ 339.5	95.4%
Withdrawal	\$ 162.2	\$ 164.5	101.4%
Retirement	\$ 6,041.6	\$ 6,040.6	100.0%
<b>Total Actives</b>	<b>\$ 6,670.7</b>	<b>\$ 6,651.9</b>	<b>99.7%</b>
<b>Inactive</b>			
Vested Term	\$ 103.5	\$ 103.0	99.5%
Nonvested Term Due Refund	\$ 7.9	\$ 7.9	100.0%
Retired	\$ 483.4	\$ 486.9	100.7%
Beneficiary	\$ 21.3	\$ 21.5	100.6%
Disabled	\$ 53.3	\$ 53.7	100.7%
LOP Liability	\$ 9.2	\$ 9.3	100.9%
<b>Total Inactive</b>	<b>\$ 678.6</b>	<b>\$ 682.2</b>	<b>100.5%</b>
<b>Total</b>	<b>\$ 7,349.3</b>	<b>\$ 7,334.1</b>	<b>99.8%</b>
<b>Present Value of Future Salaries</b>	<b>\$ 17,298.5</b>	<b>\$ 17,298.7</b>	<b>100.0%</b>



# Replication of Liabilities

Entry Age Normal Cost	LEOFF 2		
	OSA	Cheiron	Ratio
Death	\$ 5.2	\$ 6.0	117.1%
Disability	\$ 15.8	\$ 15.9	100.2%
Withdrawal	\$ 13.4	\$ 15.1	112.9%
Retirement	\$ 201.1	\$ 199.4	99.2%
<b>Total</b>	<b>\$ 235.5</b>	<b>\$ 236.5</b>	<b>100.4%</b>

Does not include the post valuation changes to duty death benefits

While some individual decrements do not match within normal tolerances, in aggregate we are within 0.4% which is well within standard actuarial tolerances for replication audits of this size system



# Replication of Liabilities

	Projected Unit Credit	Entry Age Normal
1. Actuarial Value of Assets	\$5,564.2	\$5,564.2
2. Actuarial Liability	\$4,309.2	\$4,618.8
3. Funded Status [1. / 2.]	129.1%	120.5%

*Amounts in millions  
Based on OSA valuation results*

- Contributions are based on the Aggregate method with minimum rates based on the Entry Age Normal method
- GASB requires funded status disclosure on Entry Age Normal method. GASB's preliminary views would also require annual expense to be determined under Entry Age Normal
- Valuation reports funded status using Projected Unit Credit method
- Consider using Entry Age Normal to report funded status in valuation
  - Reduces potential confusion of multiple funded status measures
  - Projected Unit Credit not used for any other purpose



# Replication of Contribution Rates

## Determination of the actuarial gain or loss due to investment return

- OSA uses assets reported by WSIB which do not include payables and receivables
- Typical practice would be to use DRS assets that are reported in CAFR
- Difference is minimal and only used for development of actuarial value of assets, so there is no conflict with the disclosures in the CAFR

	<b>OSA</b>	<b>Cheiron</b>
Market Value of Assets, July 1, 2008	\$5,300.0	\$5,315.4
Net Cash Flow	215.6	216.5
Market Value of Assets, June 30, 2009	4,293.5	4,308.7
Actual Investment Return	(1,222.1)	(1,223.2)
Expected Investment Return	431.1	433.7
Investment Gain / (Loss)	(1,653.2)	(1,656.9)

*Amounts in millions*



# Replication of Contribution Rates

## Development of Actuarial Value of Assets

1. Market Value of Assets						\$	4,308.7
Year	(Gain) / Loss	Investment Return	Smoothing Period	% Unrecognized	Amount Unrecognized		
2003	\$ (154.1)	15.13%	8	12.5%	\$ (19.3)		
2004	\$ (145.4)	13.64%	6	0.0%	\$ -		
2005	\$ (287.9)	17.55%	8	37.5%	\$ (108.0)		
2006	\$ (284.8)	15.77%	8	50.0%	\$ (142.4)		
2007	\$ (463.8)	16.61%	8	62.5%	\$ (289.9)		
2008	\$ 491.2	-1.33%	8	75.0%	\$ 368.4		
2009	\$ 1,653.2	-22.64%	8	87.5%	\$ 1,446.6		
2. Total Unrecognized						\$	1,255.5
3. Preliminary Actuarial Value of Assets [1. + 2.]						\$	5,564.2
4. Minimum AVA (70% of MVA)						\$	3,016.1
5. Maximum AVA (130% of MVA)						\$	5,601.3
6. Actuarial Value of Assets [3., but not greater than 5. or less than 4.]						\$	5,564.2

*Amounts in millions*





# Replication of Contribution Rates

## Calculation of LEOFF 2 Normal Contribution Rate

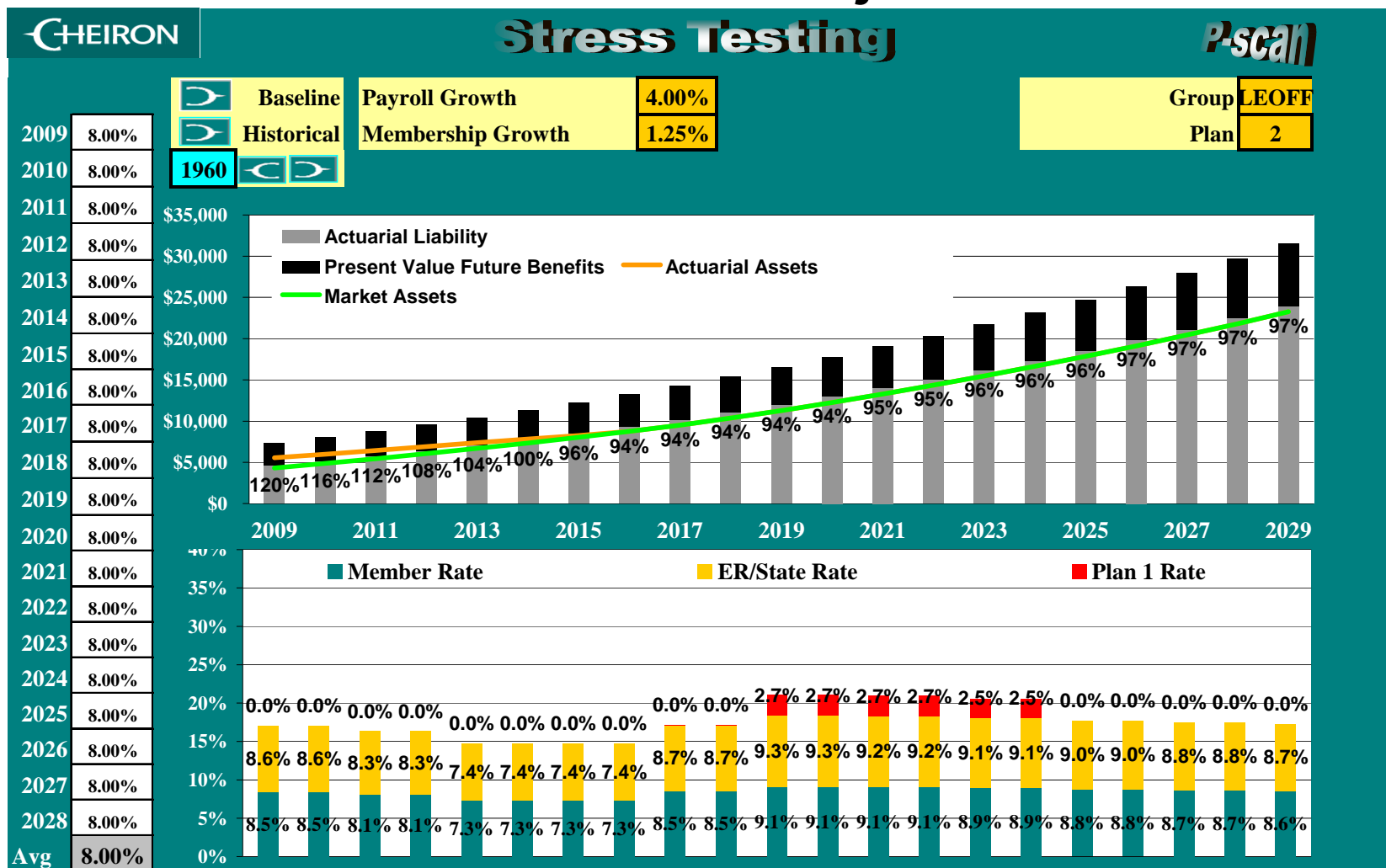
1.	Present Value of Future Benefits	\$ 7,349.3
2.	Actuarial Value of Assets	\$ 5,564.2
3.	Present Value of Future Salaries	\$ 17,298.5
4.	Total Aggregate Normal Cost $[(1. - 2.) / 3.]$	10.32%
5.	Total Entry Age Normal Cost	16.19%
6.	Total Normal Contribution Rate [Maximum of 4. and 5.]	16.19%
7.	Employee Contribution Rate [50% of 6.]	8.09%
8.	Employer Contribution Rate [30% of 6.]	4.86%
9.	State Contribution Rate [20% of 6.]	3.24%

*Dollar amounts in millions.*

- This calculation matches OSA's calculation with a difference in rounding
- LEOFF 1 is more than 100% funded, so there is no additional charge to LEOFF 2



# Deterministic Projections



- Does not include the post valuation changes to duty death benefits.
- Employer/state rate includes 0.16% for administrative expenses



# Other Minor Issues

- Payroll growth for LEOFF 1 is 4.0%, but for LEOFF 2, it is 4.5%. Not clear how amortization of LEOFF 1 unfunded should be calculated
- Consider removing membership growth assumption. It is not consistent with standard actuarial practice and defers amortization payments further into the future
- The joint and survivor factors were not on the Washington Administrative Code (WAC) website under section - had to get them from the OSA
- The factors for the conversion of the account balances are out of date on the WAC website (WAC 415-02-340) - the table currently on the website is based on the 1995-2000 Experience study



# Other Minor Issues

- The description of the how the base mortality table was projected was not accurate - the experience study from 2006-2009 had the correct description
- Assumption for occupational disease for firefighters (LEOFF 2) was not disclosed in the valuation report
- Uses assumptions (from the experience study) vs. actual demographics for the firefighters benefit for LEOFF2
- Assumption for commencement of benefits for vested terminated members not disclosed in valuation report



# Questions





# Reliance

- For purposes of the results of this actuarial audit we relied on the data provided to us by the OSA and DRS and the plan provisions described in state statute.
- The actuarial assumptions and methods that support the results will be delineated in our audit report once finalized
- The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards to issue the Actuarial Opinions in this presentation

William R. Hallmark, FCA, ASA

Kenneth A. Kent, FCA, FSA

# Contribution Rate Adoption – July 28, 2010

## Background – 2008 Contribution Rate Adoption

<b>Four Options – Entry Age Normal Cost (EANC)</b>	<b>Member</b>	<b>Employer</b>	<b>State</b>
1. Experience study assumptions only	8.20%	4.92%	3.28%
2. Experience study assumptions with a decrease in the salary assumption	7.97%	4.78%	3.19%
3. Experience study assumptions with a decrease in the salary assumption & with improved mortality assumptions	8.21%	4.93%	3.28%
<b>4. Experience study assumptions with improved mortality assumptions</b>	<b>8.45%</b>	<b>5.07%</b>	<b>3.38%</b>

Board chose option 4 and that the rate be fixed for four years (7/1/09 through 6/30/12).

At the July 22, 2009 meeting, the Board approved a supplemental contribution rate increase of 0.01% member and employer to fund the cost of SHB 1953 (Transfer of service credit for Fish & Wildlife Enforcement Officers).

### Current Contribution Rate (effective as of 9/1/09)

Member	Employer	State
8.46%	5.08%	3.38%

The supplemental rate for SHB 1953 is effective through 6/30/11.

## 2010 Contribution Rate Adoption Options

<b>Options – Entry Age Normal Cost (EANC)</b>	<b>Member</b>	<b>Employer</b>	<b>State</b>
1. No action – continue with current rates through 6/30/13	8.45%	5.07%	3.38%
2. Continue current rates through 6/30/17	8.45%	5.07%	3.38%
3. Rates based on 100% of EANC from 2009 actuarial valuation	8.23%	4.94%	3.29%
4. Rates based on 90% of EANC from 2009 actuarial valuation	7.42%	4.46%	2.96%

If option 3 or 4 is chosen then the Board must adopt a supplemental contribution rate increase of 0.09% member, 0.06% employer and 0.03% state.

<b>Supplemental Contribution Rate - 2010</b>	<b>Member</b>	<b>Employer</b>	<b>State</b>
EHB 2519 – Duty-Related Death Benefits	0.05%	0.03%	0.02%
SHB 1679 – Catastrophic Disability Medical Ins.	0.04%	0.03%	0.01%

Medical reimbursement rates will not be adopted today. Those rates will be adopted by the Board later this interim.

The Board adopted a modified option # 2 with a member rate of 8.46%, employer rate of 5.08% and a State rate of 3.38%, but with the same extended time period.

# OLIVER CONSULTING

## CONSULTING ACTUARIES

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SAUSALITO, CALIFORNIA 94965  
415-331-5784, voice  
415-331-0559, fax

July 27, 2010

Law Enforcement Officers' & Firefighters' Plan 2 Retirement Board  
P.O. Box 40918  
Olympia, Washington 98504-0918

Re: Actuarial Review: of 2519 EHB March 10, 2010 Fiscal Note

Chairman Fox and Members of the Board:

There follow the results of our actuarial review of the above fiscal note.

### **Background**

SHB 2519 makes the following changes to the LEOFF 2 duty death benefits:

- (1) Changes the \$150,000 death benefit to \$214,000, increased annually, starting 7/1/2010, by the increase in the CPI-U for Seattle, Washington area up to 3% per year
- (2) Removes the 10-year service requirement for the survivor annuity benefit
- (3) Removes the 10-year service requirement for the 1.5 member account multiple
- (4) Removes the joint and survivor annuity reduction factor from the survivor annuity benefit

Change (1) is retroactive to January 1, 2009. Changes (2), (3) and (4) are retroactive to October 1, 1977.

The estimated increases in contribution rates calculated by the Office of the State Actuary are shown below.

Employee	0.05%
Employer	0.03%
<u>State</u>	<u>0.02%</u>
Total	0.10%

### **Results of Review**

#### ***Data, Assumptions and Methods***

Data for survivors eligible for retroactive benefits was supplied by DRS. We reviewed the data for internal consistency, but otherwise accepted this data. We also accepted DRS interpretations of methodologies to be used to calculate retroactive benefits as outlined in the fiscal note – including a determination that interest would not be charged on withdrawn account balances.

Increases in contribution rates are calculated based on the Aggregate Cost Method without application of the entry age normal cost minimum. Other methods, assumptions, and data were those used in the LEOFF 2 June 30, 2008 actuarial valuation.



**Summary**

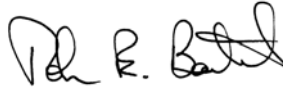
We reviewed the actual calculations performed by OSA and did not find any differences that would have changed the supplemental rates shown on page 1.

The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Sincerely,



Marilyn M. Oliver, F.S.A., M.A.A.A.  
Actuary and Principal  
Oliver Consulting  
Contractor



John E. Bartel, A.S.A., M.A.A.A.  
President  
Bartel Associates, LLC  
Peer Review

Cc. Steve Nelsen, Executive Director; Matthew M. Smith, State Actuary



## Office of the State Actuary

*"Securing tomorrow's pensions today."*

July 27, 2010

Mr. Steve Nelsen  
Executive Director  
LEOFF Plan 2 Retirement Board  
P.O. Box 40918  
Olympia, Washington 98504-0918

### **SUBJECT: PENSION CONTRIBUTION RATES**

Dear Steve:

I am providing the preliminary results of the 2009 actuarial valuation of the Law Enforcement Officers' and Fire Fighters' Retirement System Plan 2 (LEOFF 2) and contribution rate options for the Board's consideration.

The primary purpose of the valuation is to determine contribution requirements for LEOFF 2 as of the valuation date, June 30, 2009, and should not be used for other purposes. The results are based on the economic assumptions and asset value smoothing technique included in RCW 41.45.035 and funding policies established under Chapter 41.45 RCW and by the Board.

The actuarial auditor has completed the review of the 2009 valuation results, and the results have not changed from the preliminary results provided in June. The results are still considered preliminary until the Board adopts contribution rates.

There are two key policy decisions before the Board regarding the adoption of contribution rates. First, the Board will consider whether to continue the current rates adopted in 2008, or adopt supplemental rates for FY 2011. Second, in adopting basic rates for the 2011-13 Biennium, the Board will consider whether to continue the current rates, or adopt rates based on the results of the 2009 actuarial valuation.

### ***Valuation Results***

We provided an executive summary of the preliminary 2009 valuation results at your June board meeting. I will forward a final actuarial valuation report to the Board this fall reflecting your final decisions on rates and assumptions.

### **Contribution Rates**

All of the contribution rate options outlined in this communication are reasonable for funding the benefits in LEOFF 2 during the 2011-13 Biennium. In addition, the rates





include the cost of medical benefits that will be paid through a 401(h) account when that account becomes operational later this year.

### ***Supplemental Rates for the 2011 Fiscal Year***

The Board may choose to (1) adopt supplemental rates for FY 2011, or (2) keep the current contribution rates.

Under current law, benefit improvements passed in the 2010 Legislative Session require additional funding. The past practice of the Board has been to adopt supplemental rates resulting from benefit improvements. However, the rates currently collected are sufficient to cover this additional funding requirement, and the Board may decide to maintain level contributions and skip the supplemental rate process this year.

If the Board elects to adopt supplemental rates, they will be effective from September 1, 2010, through June 30, 2011 (Attachment A). If the Board chooses not to adopt supplemental rates, the current rates will remain in effect and no additional rates will be collected for that period.

### ***Basic Contribution Rates for the 2011-13 Biennium***

Basic contribution rates for the period July 1, 2011, through June 30, 2013, will include the cost of benefit improvements from the 2010 Legislative Session. The Board may choose to (1) continue current contribution rates throughout the 2011-13 Biennium, or (2) adopt rates based on the results of the 2009 actuarial valuation.

### ***Continuing Current Rates***

The rates currently collected (Attachment B) are sufficient to fund the cost of all benefits in LEOFF 2 during the 2011-13 Biennium including the benefit improvements from the 2010 Legislative Session. Current rates are based on the 2007 actuarial valuation, include subsequent temporary and supplemental rates, and were adopted in 2008 for two biennia: 2009-11 and 2011-13.

If the Board chooses to continue these rates, it could do so:

- ❖ For the 2011-13 Biennium (no Board action required).
- ❖ For an additional two biennia: 2013-15 and 2015-17 (requires Board action).

Adopting the current rates for an additional two biennia would provide rate stability during a period where we expect contribution rate levels to drop. Rates are projected to increase beyond the current level starting in 2017.



**Adopting Rates Based on 2009 Actuarial Valuation Results**

The contribution rate levels based on the 2009 actuarial valuation are lower than the rates currently collected. If the Board elects to adopt rates based on the 2009 valuation they may choose to adopt the rates:

- ❖ At 90 percent of the Entry Age Normal Cost (EANC), (Attachment C), or
- ❖ At 100 percent of EANC, consistent with Board funding policy for 2009-13, (Attachment D).

**Additional Information**

At the June meeting, the Board requested additional information regarding the preliminary 2009 valuation results. Specifically, the effect on projected rates if the Board adopted 100 percent EANC using the 2009 actuarial valuation results (Attachment E) or if the Board continued the current rates adopted in 2008 (Attachment F). For your reference, we have also attached projected rates from last month's presentation.

I hope the Board finds this information useful during their deliberations. Please don't hesitate to contact me directly should you require any additional information.

Sincerely,

Matthew M. Smith, FCA, EA, MAAA  
State Actuary

**Attachments**

- Attachment A – Adopt Supplemental Contribution Rates
- Attachment B – Continue Current Rates
- Attachment C – 2009 Actuarial Valuation 90 Percent EANC Policy
- Attachment D – 2009 Actuarial Valuation 100 Percent EANC Policy
- Attachment E – Projected LEOFF 2 Member Rates – 2009 Actuarial Valuation  
100 Percent EANC 2011-13
- Attachment F – Projected LEOFF 2 Member Rates – Maintain Current Rates For  
2011-13
- Attachment G – Projected LEOFF 2 Member Rates – Maintain Current Rates  
Through 2017

cc: Kelly Fox, Chair,  
LEOFF 2 Board

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### Attachment A – Adopt Supplemental Contribution Rates

	Current Rates	Supplemental Rates	Total Rates (9/1/10 - 6/30/11)
Member	8.46%	0.09%	8.55%
Local Employer*	5.08%	0.06%	5.14%
State	3.38%	0.03%	3.41%

\*Excludes DRS administrative expense rate of 0.16%. Includes pension and medical benefits.  
Supplemental rate for SHB 1679 calculated under new disability assumptions.



### Attachment B – Continue Current Rates

	Current Rates*	2011-13 Rates	Difference
Member	8.46%	8.45%	(0.01%)
Local Employer**	5.08%	5.07%	(0.01%)
State	3.38%	3.38%	0.00%

\*The rates currently collected include 0.01% member and 0.01% local employer for 2009 legislation. The Board adopted this temporary and supplemental rate that will expire on June 30, 2011.

\*\*Excludes DRS administrative expense rate of 0.16%. Includes pension and medical benefits.



**Attachment C – 2009 Actuarial Valuation 90 Percent EANC Policy**

	Current Rates*	2011-13 Rates	Difference
Member	8.46%	7.42%	(1.04%)
Local Employer**	5.08%	4.46%	(0.62%)
State	3.38%	2.96%	(0.42%)

*\*The rates currently collected include 0.01% member and 0.01% local employer for 2009 legislation. The Board adopted this temporary and supplemental rate that will expire on June 30, 2011.*

*\*\*Excludes DRS administrative expense rate of 0.16%. Includes pension and medical benefits.*



**Attachment D – 2009 Actuarial Valuation 100 Percent EANC Policy**

	Current Rates*	2011-13 Rates	Difference
Member	8.46%	8.23%	(0.23%)
Local Employer**	5.08%	4.94%	(0.14%)
State	3.38%	3.29%	(0.09%)

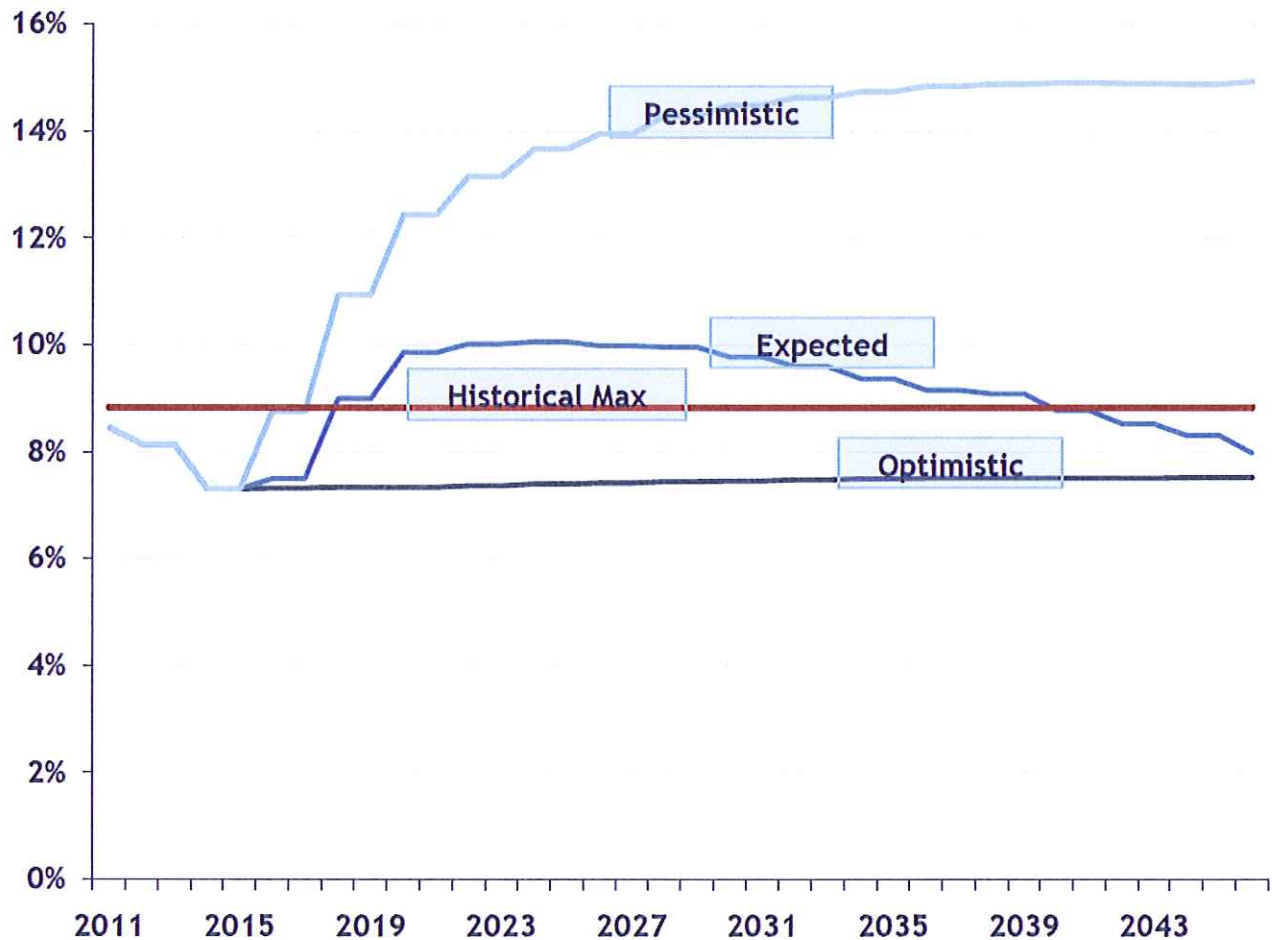
*\*The rates currently collected include 0.01% member and 0.01% local employer for 2009 legislation. The Board adopted this temporary and supplemental rate that will expire on June 30, 2011.*

*\*\*Excludes DRS administrative expense rate of 0.16%. Includes pension and medical benefits.*





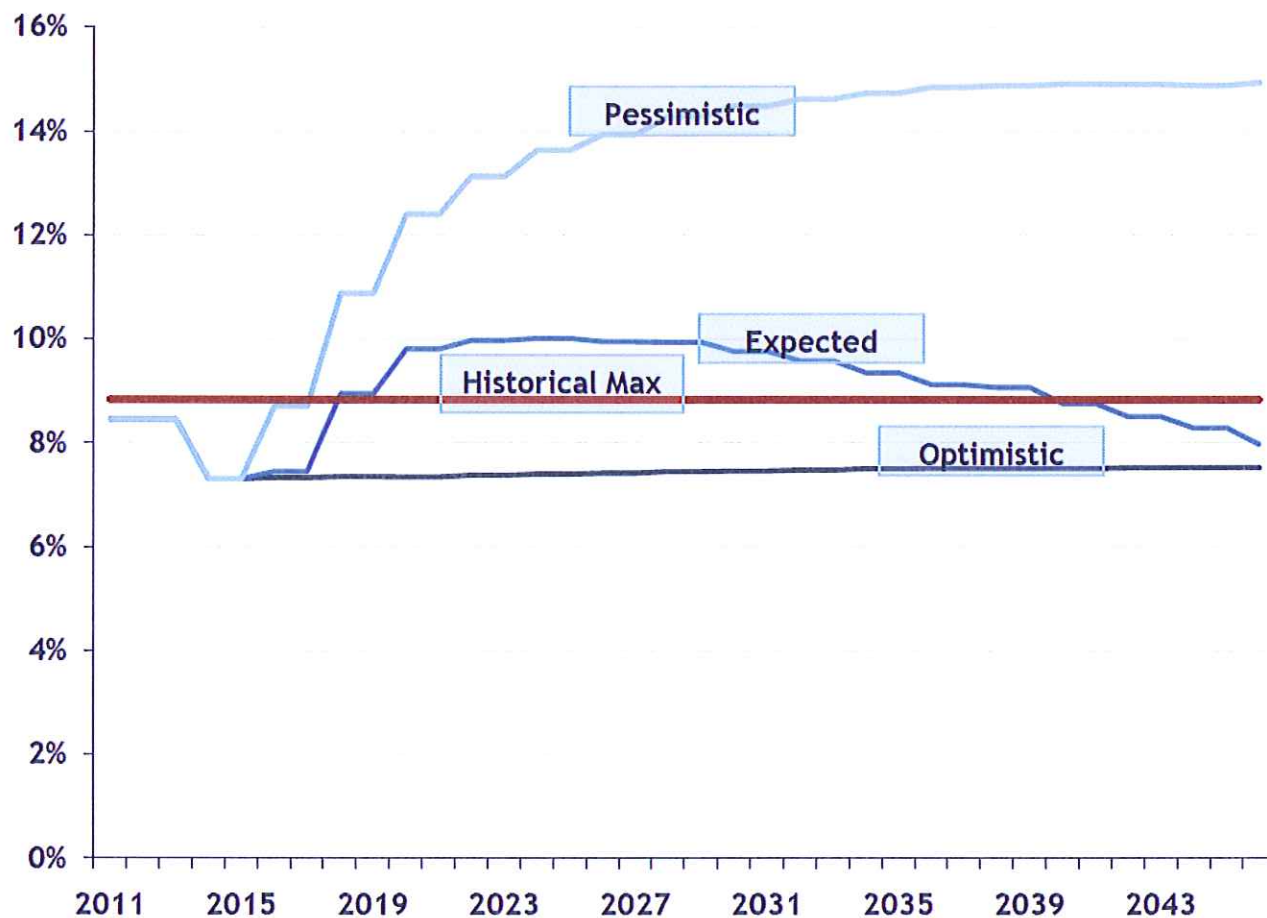
**Attachment E – Projected LEOFF 2 Member Rates – 2009 Actuarial Valuation,  
100 Percent EANC For 2011-13\***



\*Pension Only.



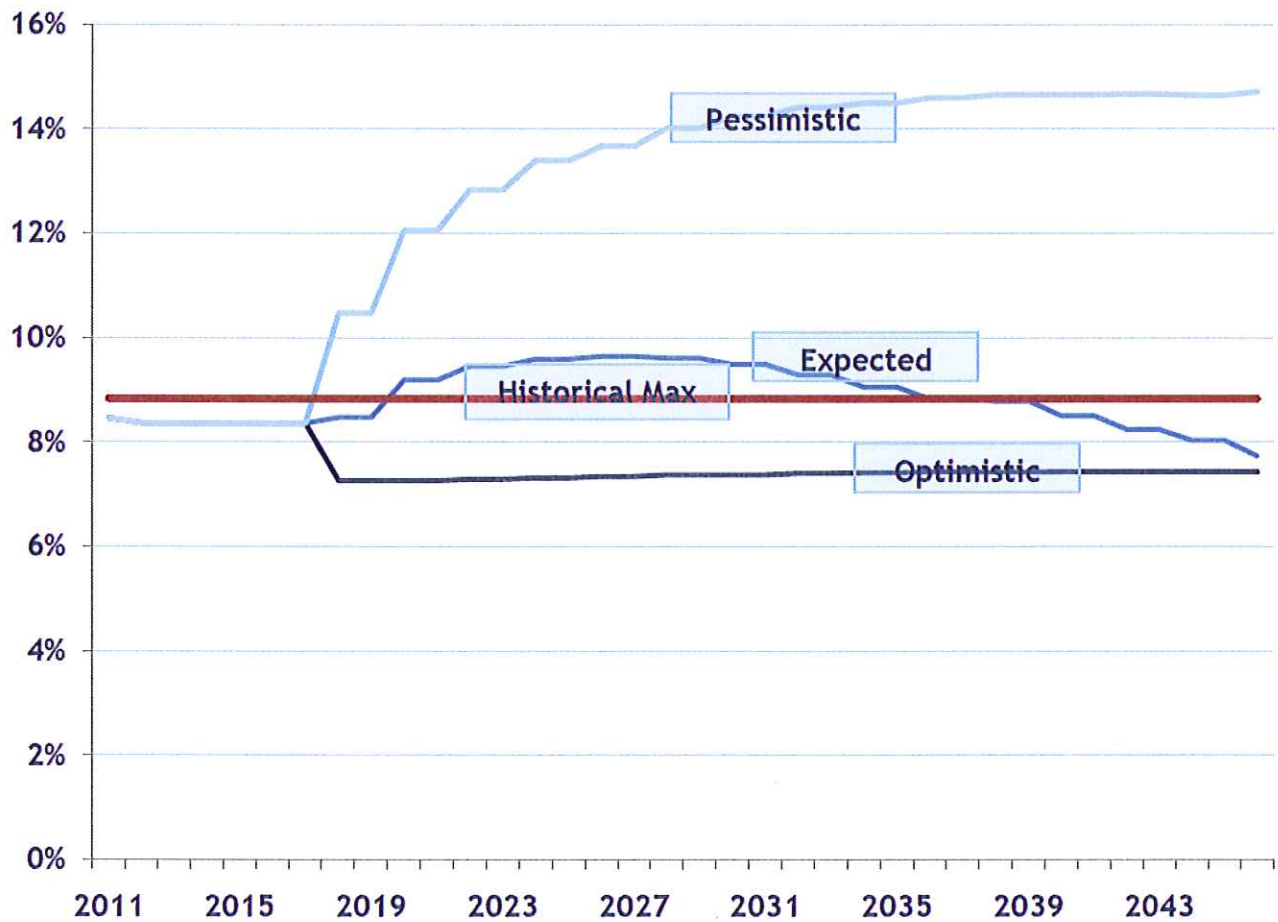
**Attachment F – Projected LEOFF 2 Member Rates – Maintain Current Rates  
For 2011-13\***



\*Pension Only.



**Attachment G - Projected LEOFF 2 Member Rates – Maintain Current Rates Through 2017\***



\*Pension Only