

LEOFF Plan 2 Preliminary Experience Study and Actuarial Valuation Results

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Today's Presentation

- Highlights from preliminary experience study and actuarial valuation report
- Budget impact of assumption changes and updated contribution rates
- Decisions for July meeting



What Is An Experience Study?

- Review of current assumptions
 - How do they compare with actual experience?
 - Do they need to change?
- Assumptions help us estimate
 - When benefits are paid
 - How much is paid
 - How long they're paid

Why Do We Perform Them?

- Things change
- Ensure assumptions remain reasonable
 - Reasonable assumptions contribute to reasonable funding
- Important part of systematic actuarial funding
- Risk management



How Do We Perform Them?

- They're data driven
 - Over 20 years of experience in some cases
- They also involve professional judgment
 - Past not always the best predictor of future
- Because they involve professional judgment and expertise
 - You hire an actuary to perform studies and certify work
 - You hire an outside actuary to review reasonableness

Why Are The Results Preliminary?

- Concurrent actuarial audit in progress
- The results may change
- Final results available in July



Summary Of Updates To Current Assumptions

■ Mortality

- Changes to reflect lower mortality rates since last study
- Updates to projected increases in life spans
- Increases short-term costs
- Most significant assumption change in this experience study

■ Retirement

- Changes to reflect later retirement
- Decreases short-term costs

■ Termination

- Changes to reflect fewer terminations
- Decreases short-term costs



Summary Of Updates To Current Assumptions *(Continued)*

- **Disability**
 - Adjustments made to overall disability rates and percent duty disability
 - No changes made to percent total disability
 - Increases short-term costs
- **Salary increases**
 - Changes to “service based” salary increase assumptions
 - Lowered early career increases and extended salary scale
 - Increases short-term costs
- **Miscellaneous assumptions**
 - Increases short-term costs
- **Supporting data provided in Attachments A-F**

National Studies Show People Are Living Longer

- Life expectancy has increased about two years per decade since 1960

Year	Life Expectancy
1900	47.3
1920	54.1
1940	62.9
1960	69.7
1980	73.7
2000	76.8
2010	78.8

*Life expectancy from birth. U.S.
Census Bureau; all races, all genders.*

Factors Affecting Future Mortality Trends

- According to Office of the Chief Actuary (OCACT) for SSA, factors contributing to generally rapid overall rate of improvement during past century
- According to OCACT, each of these developments is expected to make a substantially smaller contribution to future improvement rates
- According to OCACT, future improvements will depend on

- Access to primary medical care
- Discovery of and general availability of antibiotics and immunizations
- Clean water supply and waste removal
- Rapid rate of growth in standard of living

- Medical technology and innovation
- Treatment and evolution of existing disease; emergence of new disease
- Changes in amount/type of physical activity; changes in nutrition
- Prevalence of obesity and cigarette smoking
- Other factors not summarized here

Long-Term Rates Of Mortality Improvement

- According to the Society of Actuaries (SOA), long-term averages of U.S. population mortality improvement rates generally hovered around 1.0 percent
 - In 2011, life expectancies recommended by an outside Technical Panel to SSA for their intermediate cost projections equate to a long-term improvement rate of 1.26 percent
 - In 2013, the CBO assumed a long-term improvement rate of 1.17 percent in their Long-Term Budget Outlook report
 - According to SOA, there's a long-standing pattern of lower mortality rates among retirement program participants compared to the general U.S. population
- Between 1900 and 2009, the age-sex-adjusted death rate in U.S. declined at an average rate of 1.10 percent per year
 - From 1982 to 2009, the same death rate declined at an average rate of 0.92 percent per year

Mortality Projection Scales

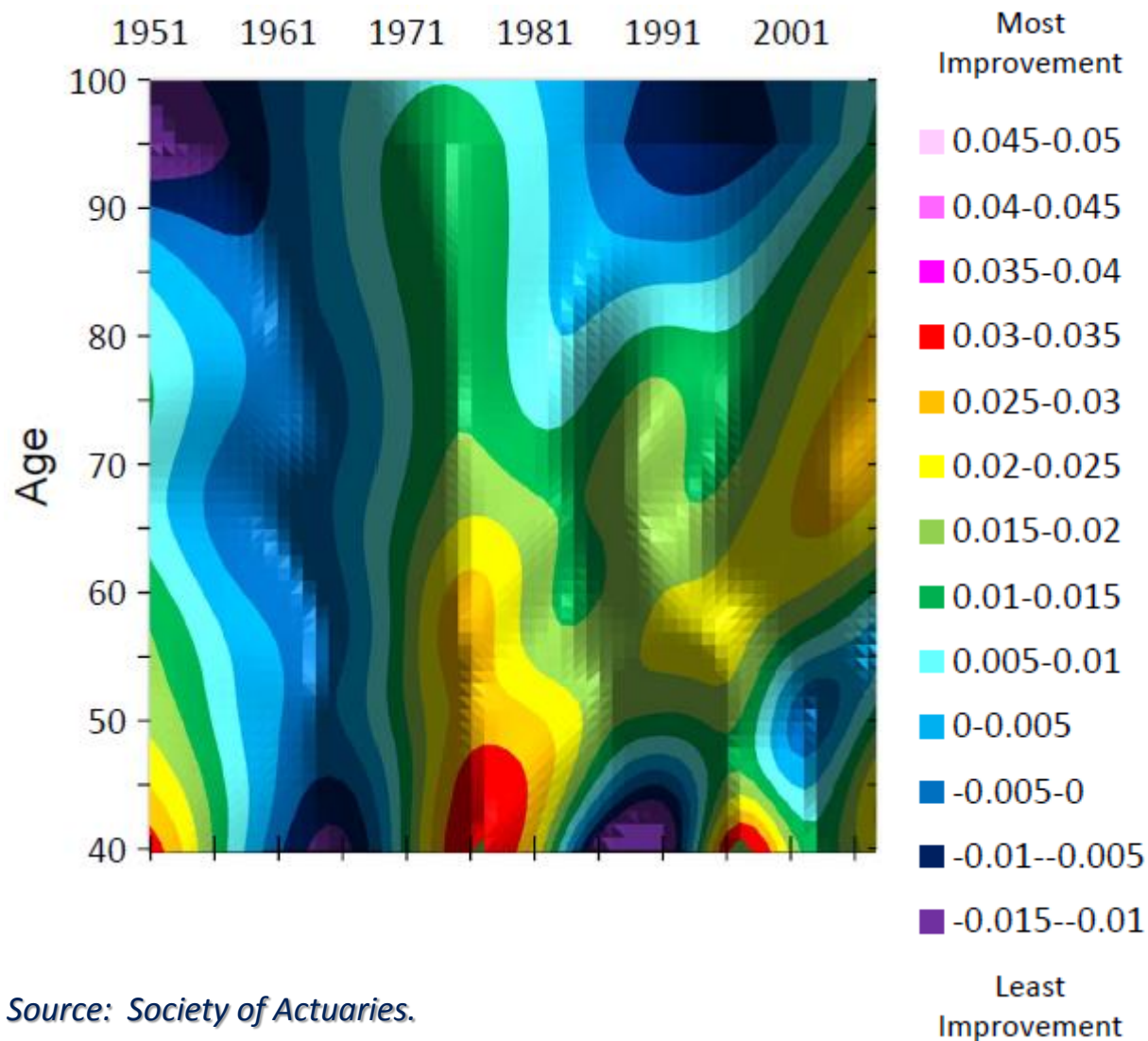
- Several projection scales available from SOA
 - Scale AA
 - Scale BB
 - MP-2014 (proposed; not final)
- Represent rates of improvement (decreases) in future mortality rates
 - Separate rates by gender
- Vary by dimension/format of scale and experience data used to develop scale
 - 1D – age only
 - 2D – age and year of birth
- Current assumption is 50 percent of Scale AA
- Updated assumption is 100 percent of Scale BB

Scale AA

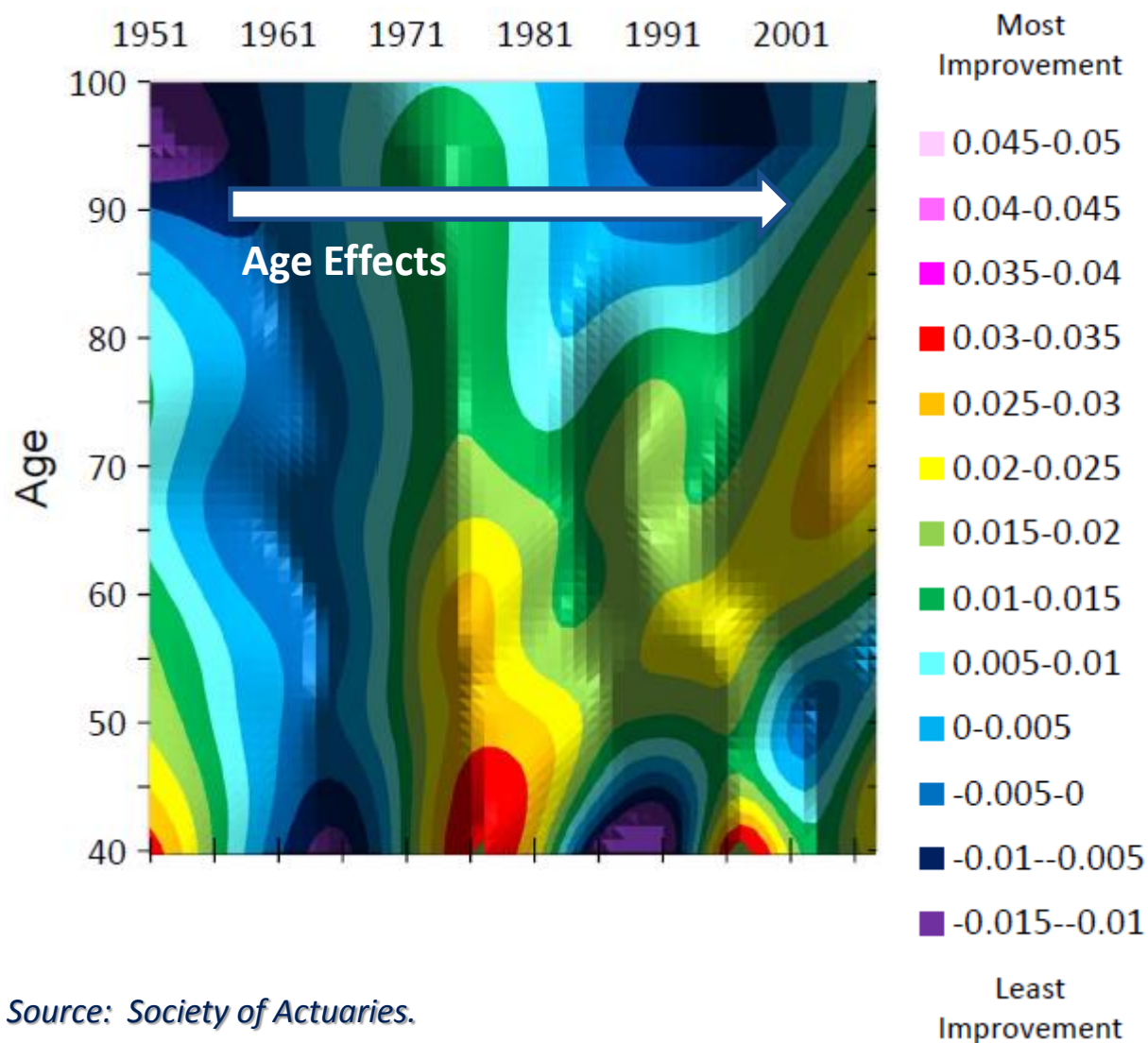
- First projection scale released by SOA in 1995
- Developed using SSA and Civil Service Retirement System data from 1977 to 1993
- Assumed rates of improvement
 - Minimum rate of improvement of 0.5 percent for ages under 85
 - Graded down to 0.1 percent at age 100
 - No improvement at ages over 100
- In late 2009, Retirement Plans Experience Committee (RPEC) of SOA found

“... a noticeable degree of mismatch between the Scale AA rates and actual mortality experience for ages under 50, and the Scale AA rates were lower than actual mortality improvement rates for most ages over 55.”
- Analysis also showed cohort effects
 - Improvements varying by generations

Observed U.S. Mortality Improvement (Heat Map) - Males

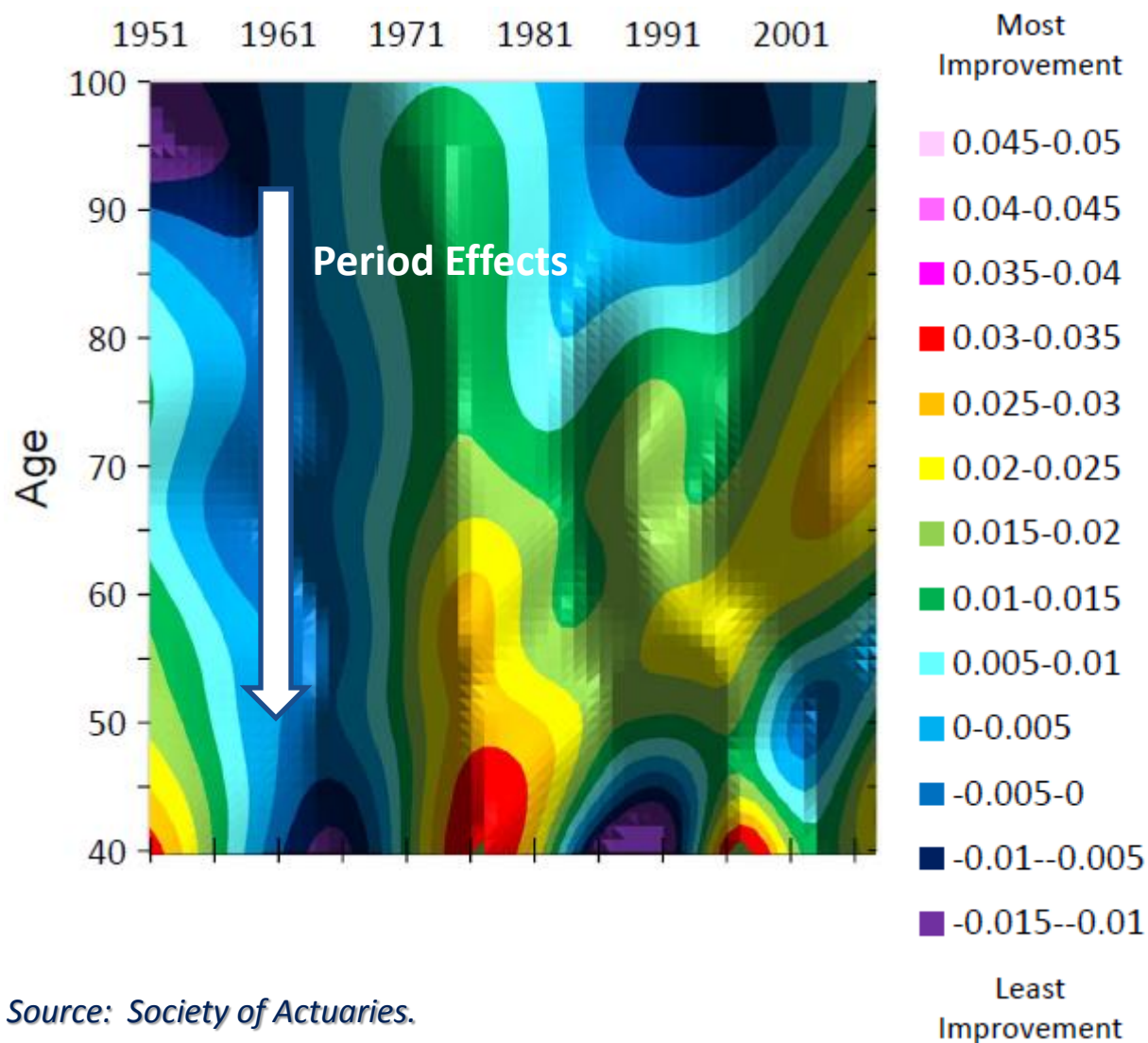


Observed U.S. Mortality Improvement (Heat Map) - Males

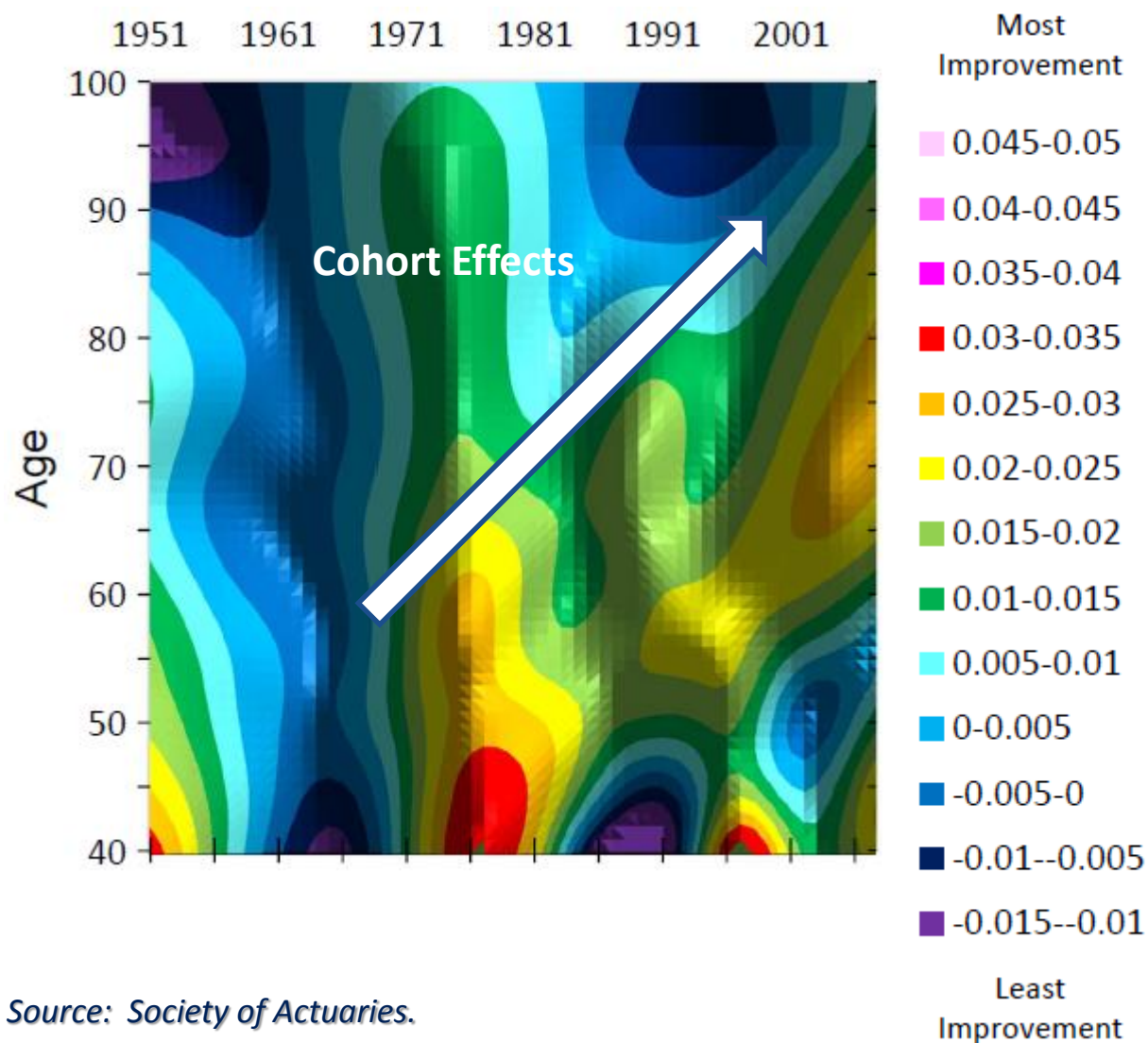


Source: Society of Actuaries.

Observed U.S. Mortality Improvement (Heat Map) - Males

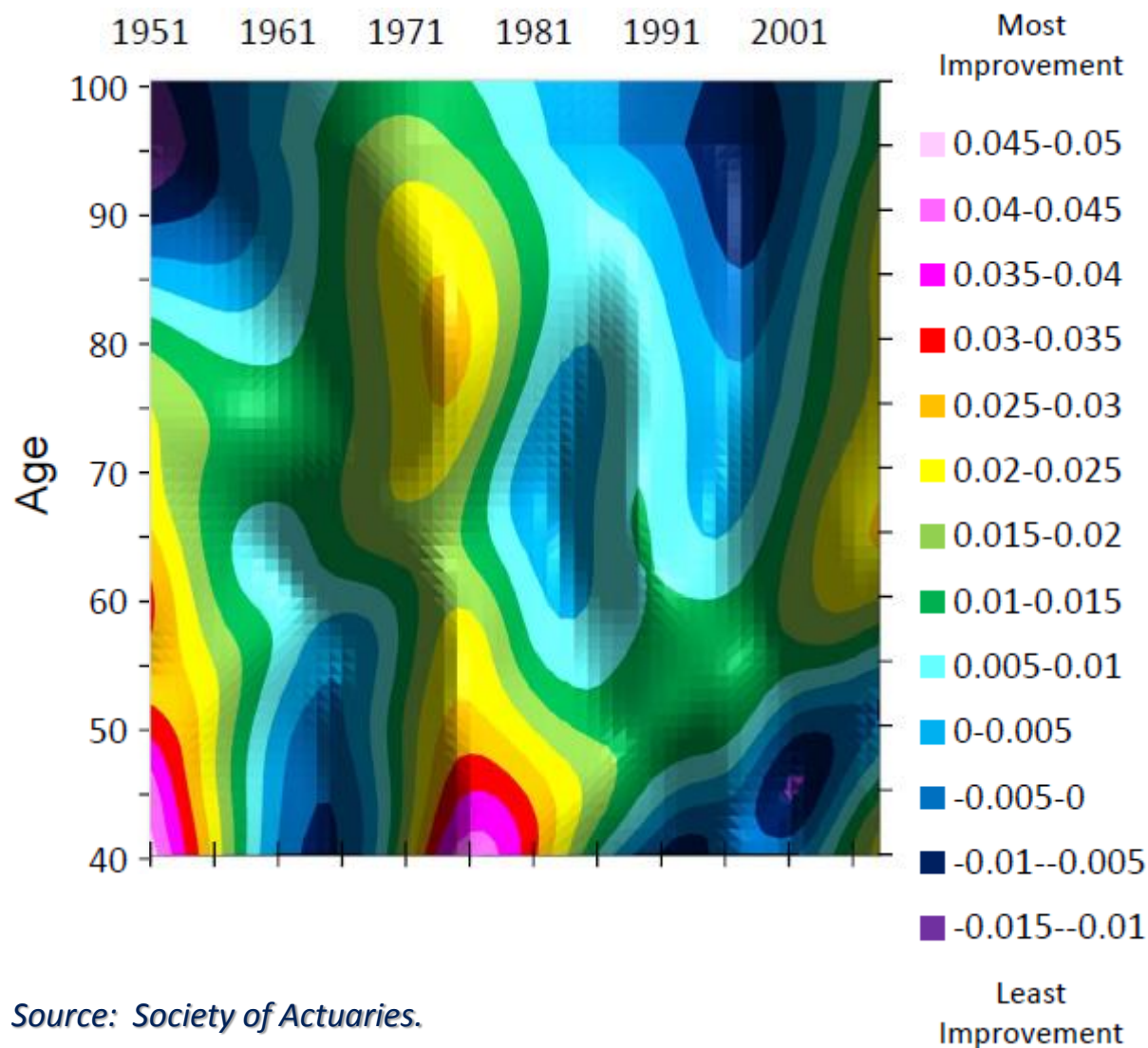


Observed U.S. Mortality Improvement (Heat Map) - Males



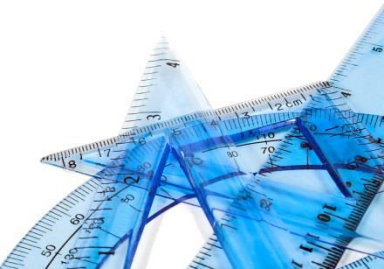
Source: Society of Actuaries.

Observed U.S. Mortality Improvement (Heat Map) - Females

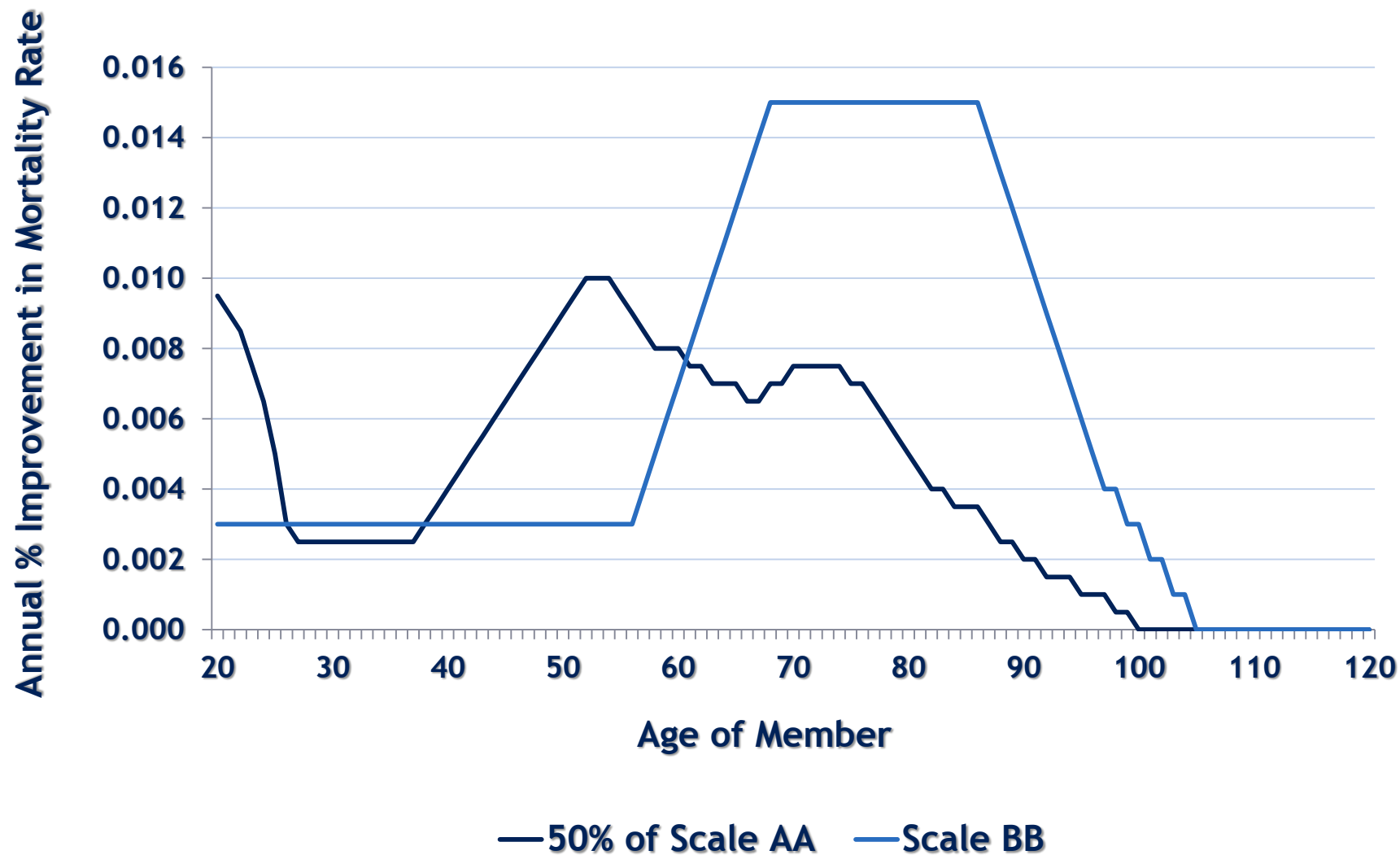


Scale BB

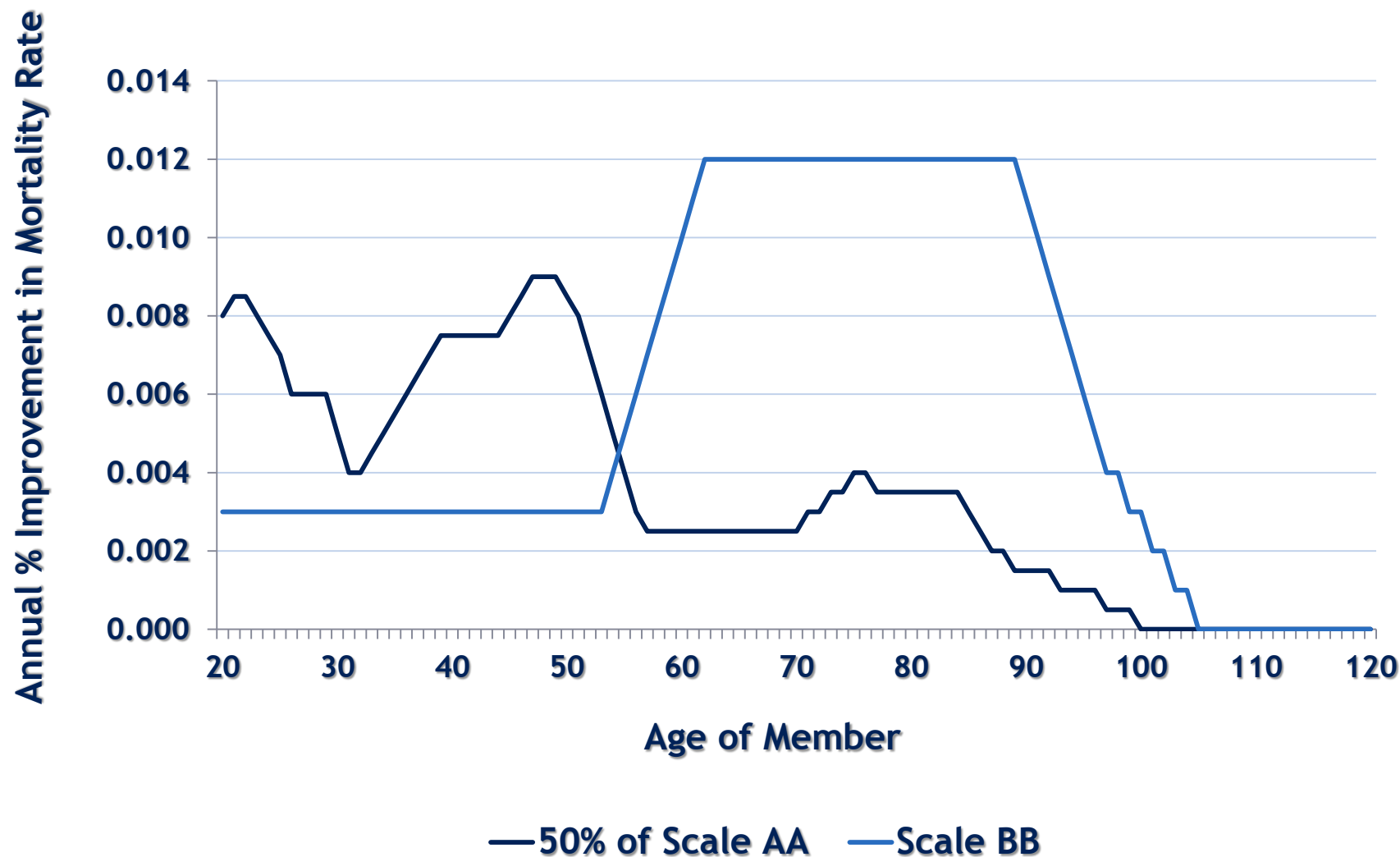
- Interim improvement scale released by SOA in 2012
- Created to replace Scale AA
- Prepare actuaries for upcoming 2D improvement scale
- Developed using SSA data from 1950 to 2007
- Assumed rates of improvement for 2D table
 - Long-term rate of 1 percent for all ages through 90
 - Decreasingly linearly from 90 to 120
 - Convergence periods of up to 20 years for age/period effects and ten years for cohort effects
- 2D table converted to an approximate 1D table



Comparison Of Current Assumption To Updated Assumption - Males



Comparison Of Current Assumption To Updated Assumption - Females



How Much Mortality Improvement Do We See In Washington?

	% of Scale AA	% of Scale BB
1984-2012	109%	78%
1990-2012	152%	97%
1996-2012	204%	127%
2001-2012	143%	136%

For PERS, TRS, SERS, PSERS, LEOFF, and WSPRS combined.

Comparison Of Life Expectancies – Age 65*

In 2014	50% of Scale AA (Current Assumption)	100% of Scale AA	100% of Scale BB (Updated Assumption)
Male	83.1	83.7	84.1
Female	85.4	85.7	86.4
In 2024			
Male	83.5	84.4	85.1
Female	85.6	86.1	87.3
In 2034			
Male	83.9	85.1	86.2
Female	85.8	86.6	88.2

**All based on RP-2000 combined mortality table with mortality projection to the year indicated above. No projection of mortality improvement beyond the year indicated above.*

Recap On Mortality

- Current improvement assumption is 50 percent of Scale AA
- U.S. and Washington state data shows observed mortality improvement rates exceed current assumption
- Lower mortality rates among retirement program participants compared to the general U.S. population
- RPEC of SOA recommends, subject to materiality and the actuary's specific knowledge of covered group, use of Scale MP-2014 [when final] for all retirement programs in the U.S.
 - Additional information on Scale MP-2014 in Appendix
- Until MP-2014 becomes final, Scale BB represents the interim 1D table that approximates the 2D Scale MP-2014
- Updated assumption is Scale BB for this experience study

Retirement Experience

- Changes to reflect later retirement
- Adjusted rates to closer model actual experience

LEOFF2 Retirement Experience by Age 1995-2012*					
Age	Males & Females				
	Old		New		
	Actual	Expected	Old A/E	Expected	New A/E
49-54	631	968	0.65	912	0.69
55-59	626	1,212	0.52	880	0.71
60-64	267	417	0.64	345	0.77
65-69	71	56	1.27	58	1.22
70+	5	10	0.50	10	0.50
Total	1,600	2,662	0.60	2205	0.73

**Omitted 2001 and 2007 due to odd-length valuation periods.
Totals and ratios may not agree due to rounding.*

Termination Experience

■ Changes to reflect fewer terminations

LEOFF2 Termination Experience 1995-2010*					
Service	Actual	Old		New	
		Expected	Old A/E	Expected	New A/E
0-4	1,752	1,846	0.95	1,804	0.97
5-9	796	879	0.91	788	1.01
10-14	512	544	0.94	501	1.02
15-19	267	277	0.96	304	0.88
20-24	123	148	0.83	131	0.94
25-29	23	40	0.57	26	0.88
30+	0	0	0	0	0
Total	3,473	3,734	0.93	3,556	0.98

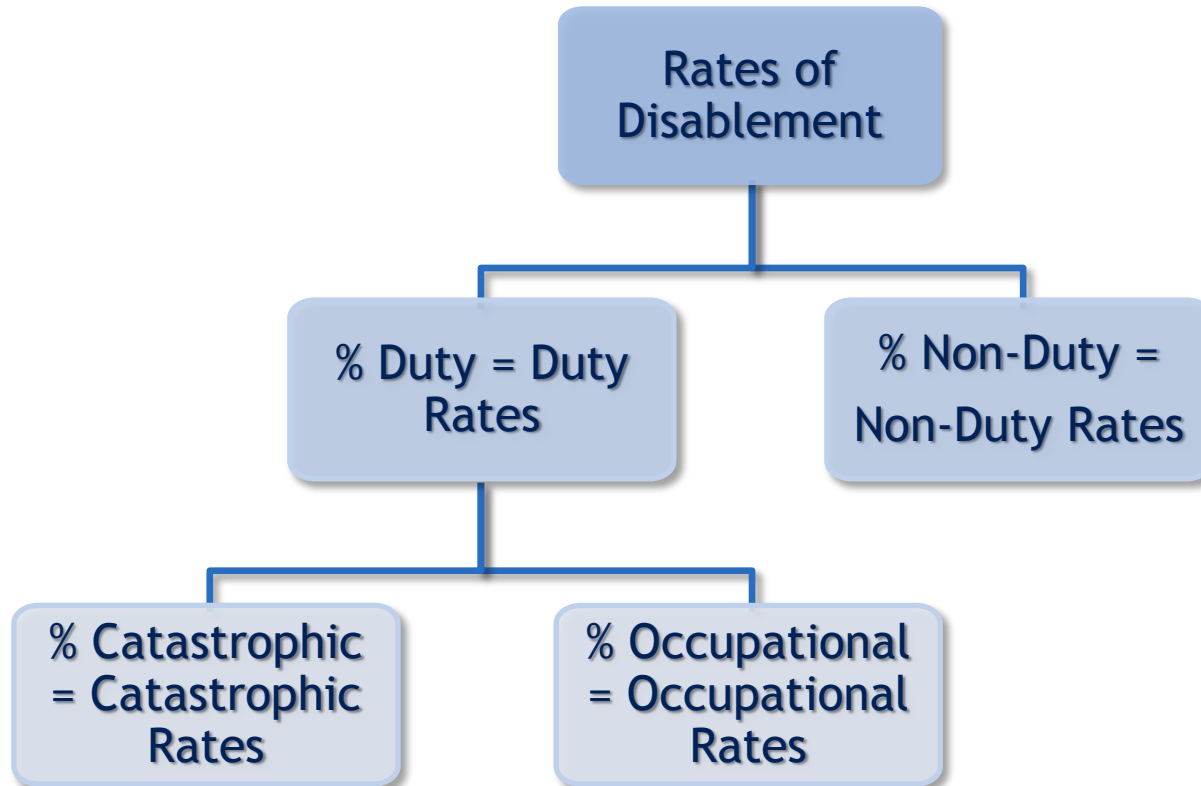
*Omitted 2001 and 2007 due to odd-length valuation periods.

Totals and ratios may not agree due to rounding.

History Of Disability Plan Provisions

- Prior to 2004
 - No distinction between duty and non-duty disablements
- 2004 (C4, L04)
 - Choice of 150 percent refund or actuarially reduced benefit with 10 percent minimum for duty-related disablement
- 2005 (C451, L05)
 - Unreduced duty-disability benefit added (occupational)
- 2006 (C39, L06)
 - Catastrophic duty-disability benefit added
- 2007 (C490, L07)
 - Occupational disease expansion
- 2010 (C259, L10)
 - Medical premium reimbursement for catastrophic disability

Actuarial Model For Disability Benefits



Disability Experience

- Adjustments made to overall disability rates moving them closer to actual experience

LEOFF 2 Disability Experience 2005-2012*					
Age	Actual	Old		New	
		Expected	Old A/E	Expected	New A/E
20-24	0	0	0	0	0
25-29	1	5	0.22	3	0.37
30-34	2	16	0.12	10	0.21
35-39	11	39	0.28	24	0.47
40-44	16	57	0.28	34	0.47
45-49	22	74	0.3	44	0.5
50-54	56	95	0.59	58	0.96
55-59	41	58	0.71	44	0.93
60-64	16	17	0.94	18	0.9
65+	1	3	0.39	2	0.62
Total	166	364	0.46	237	0.70

*Omitted 2007 due to odd-length valuation period. Totals and ratios may not agree due to rounding.

Duty Disability Experience

- Current assumption is good overall fit
- Minor adjustment made to reflect change in percent of fire fighters for the plan (percent fire fighters increased from 43 percent to 45 percent)
 - Assumes 100 percent of fire fighter disabilities are duty related
 - Assumes law enforcement officer duty-related disabilities are 95 percent at age 20 decreasing to 70 percent at age 55



Catastrophic Disability Experience

- Original assumption was 18 percent when the benefit was created
 - No experience was available
 - Future expectations only
- Assumption adjusted to 12 percent as a result of 2009 study
- Current study shows actual rate of 13 percent
 - Assumption remains unchanged at 12 percent

Service Based Salary Experience

- Actual experience was about 0.30 percent lower than assumed
- Assumption was lowered by 0.10 percent to 0.30 percent at most service levels
- We observed service based salary increases beyond 20 years of service so we extended the assumption to model that experience

LEOFF – All Plans			
Service Based Salary Increase Assumption			
Service	Actual	Old Assumption	New Assumption
1	10.74%	11.00%	10.70%
2	7.42%	7.70%	7.50%
3	5.58%	6.10%	5.90%
4	3.64%	4.00%	3.70%
5	2.52%	2.80%	2.60%
10	1.51%	1.70%	1.70%
15	1.18%	1.30%	1.20%
20	1.22%	1.10%	1.00%
25	0.47%	0.00%	0.50%
30	0.00%	0.00%	0.00%

Next Up

- Preliminary valuation results
 - June 30, 2013
 - Includes all updated demographic assumptions from experience study (ExpStudy)
- Budget impacts
 - Include results from latest actuarial valuation plus all updated assumptions



Measuring Plan Health

- Has everything happened as planned?
- Are we on track with our systematic actuarial funding plan?
- Funded status is one key measure

Funded Status

- 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



LEOFF 2 Funded Status

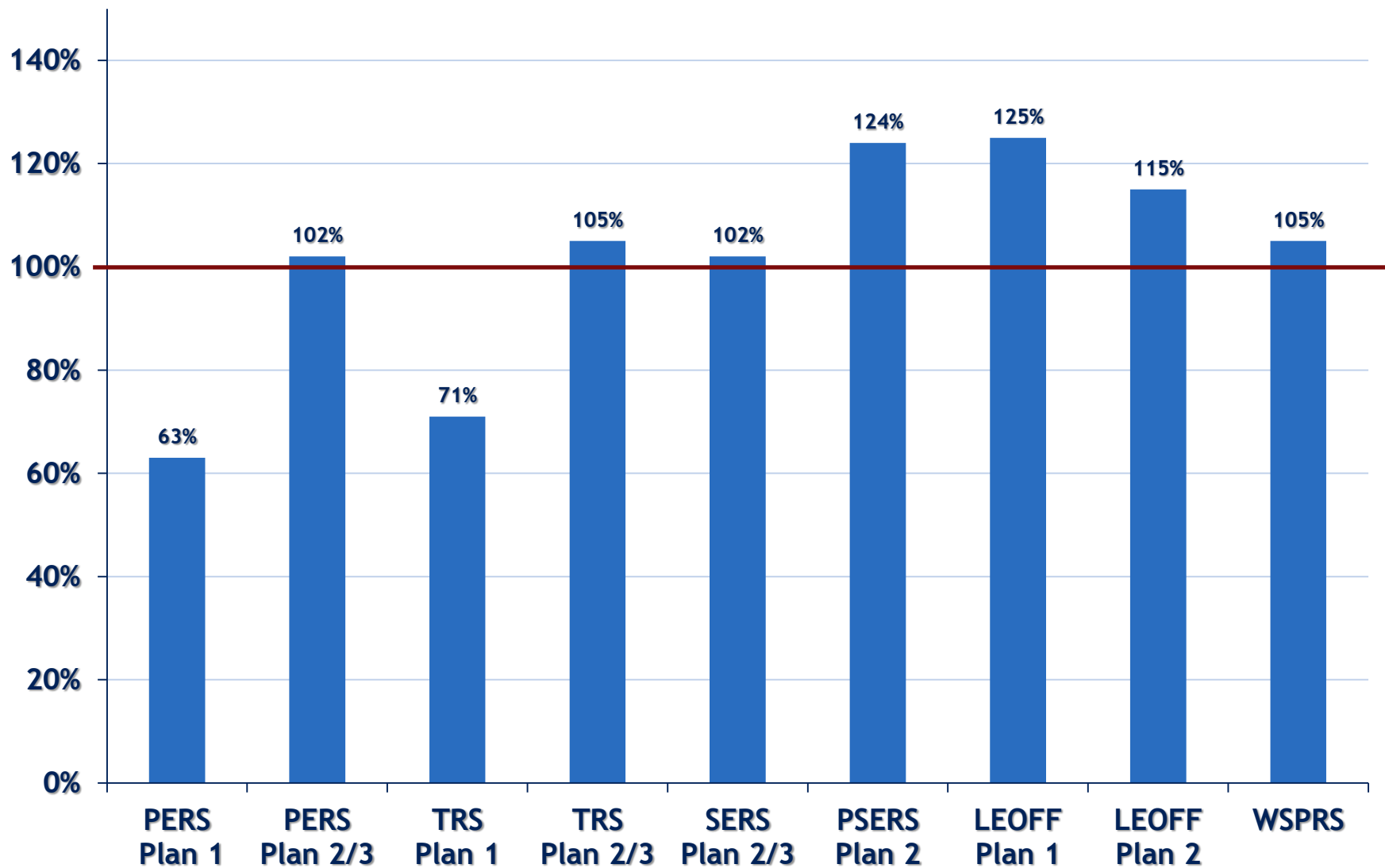
Funded Status At June 30

(Dollars in Millions)

	2013	2012
a. Present Value of "Earned" Benefits	\$6,859	\$6,071
b. Market Value of Assets	7,637	6,640
c. Deferred Gains/(Losses)	(225)	(581)
d. Actuarial Value of Assets (b-c)	7,862	7,222
e. Unfunded Liability (a-d)	(\$1,003)	(\$1,150)
f. Funded Ratio (d/a)	115%	119%

Note: Totals may not agree due to rounding.

Funded Status By Plan At June 30, 2013



LEOFF Funded Status At June 30, 2013

Funded Status on an Actuarial Value Basis		
<i>(Dollars in Millions)</i>		
	LEOFF	
	Plan 1	Plan 2
Accrued Liability	\$4,410	\$6,859
Valuation Assets	\$5,516	\$7,862
Unfunded Liability	(\$1,107)	(\$1,003)
Funded Ratio		
2013 *	125%	115%
2012	135%	119%
2011 *	135%	119%
2010 *	127%	119%
2009 *	125%	128%
2008 *	128%	133%
2007 *	123%	129%
2006 *	117%	116%
2005 *	114%	114%
2004	109%	117%
2003	112%	125%
2002	119%	137%
2001 *	129%	154%
2000 *	136%	161%

*Assumption or method change.

LEOFF Funded Status With Different Interest Rate Assumption

Funded Status				
	At 1% Lower Interest Rate Assumption		At 1% Higher Interest Rate Assumption	
<i>(Dollars in Millions)</i>	Plan 1	Plan 2	Plan 1	Plan 2
Accrued Liability	\$4,844	\$8,212	\$4,039	\$5,808
Valuation Assets	\$5,516	\$7,862	\$5,516	\$7,862
Unfunded Liability	(\$673)	\$349	(\$1,477)	(\$2,054)
Funded Ratio				
2013	114%	96%	137%	135%
2012	124%	100%	146%	140%

Up Next: Preliminary Budget Impacts

- Concurrent outside audit in progress
 - Results may change
- 2015-17 and 2017-19 budget impacts only
 - No long-term impacts provided
- Assumptions updated again in six years
- Actual costs based on actual benefits paid and actual investment returns on contributions made



Preliminary 2015-17 and 2017-19 Budget Impacts

	Increase in Budget		
	Before ExpStudy 100% EANC	After ExpStudy 90% EANC	After ExpStudy 100% EANC
<i>(Dollars in millions)</i>			
2015-2017			
General Fund	\$3	(\$10)	\$13
Non-General Fund	\$0	\$0	\$0
Total State	\$3	(\$10)	\$13
Local Government	\$4	(\$15)	\$20
Total Employer	\$7	(\$24)	\$34
Total Employee	\$7	(\$24)	\$34
2017-2019			
General Fund	\$3	(\$11)	\$15
Non-General Fund	\$0	\$0	\$0
Total State	\$3	(\$11)	\$15
Local Government	\$5	(\$16)	\$22
Total Employer	\$8	(\$27)	\$37
Total Employee	\$8	(\$27)	\$37

Budget impacts reflect difference between current contribution rates and the rates from the preliminary 2013 AVR only.

Totals may not agree due to rounding.

Preliminary 2015-17 Contribution Rates

Employee and Employer/State Contribution Rates				
	Adopted	Before ExpStudy 100% EANC	After ExpStudy 90% EANC	After ExpStudy 100% EANC
Employee	8.41%	8.60%	7.97%	8.85%
Employer*	5.05%	5.16%	4.78%	5.31%
State	3.36%	3.44%	3.19%	3.54%

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

Decisions For The July Meeting

- Maintain current rates through 2015-17
 - 8.41% Employee
- 90% EANC rate from 2013 AVR
 - 7.97% Employee
- 100% EANC rate from 2013 AVR
 - 8.85% Employee

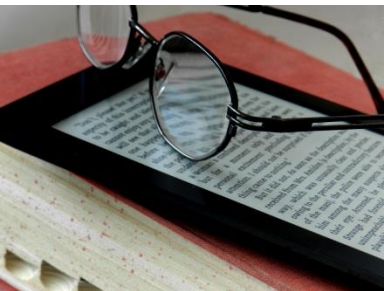


Additional References

- Supporting experience study data
 - Attachments A-F
- Staff at OSA
- Full experience study report and AVR available this fall

Appendix

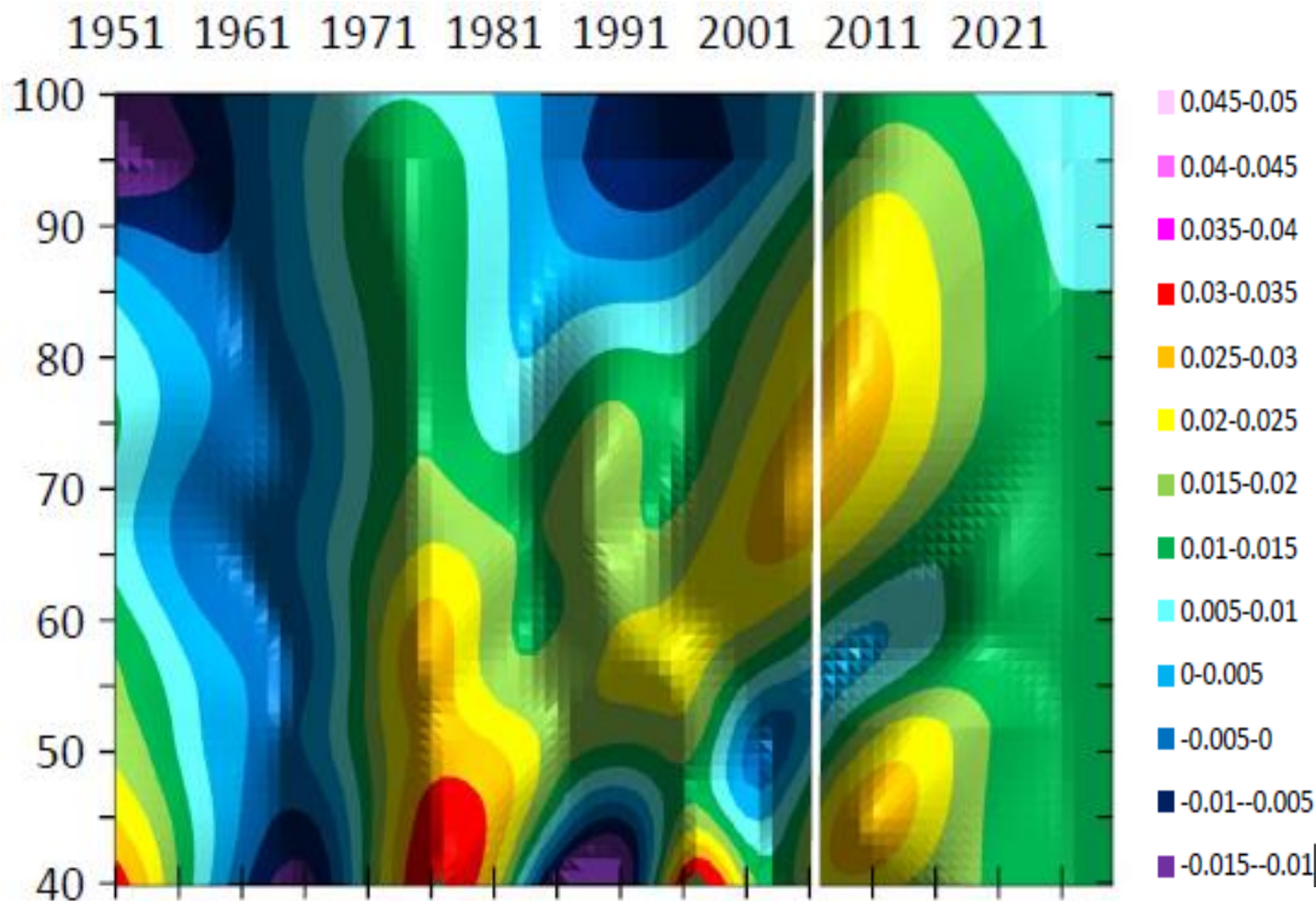
■ Information on mortality improvement scale MP-2014



Scale MP-2014

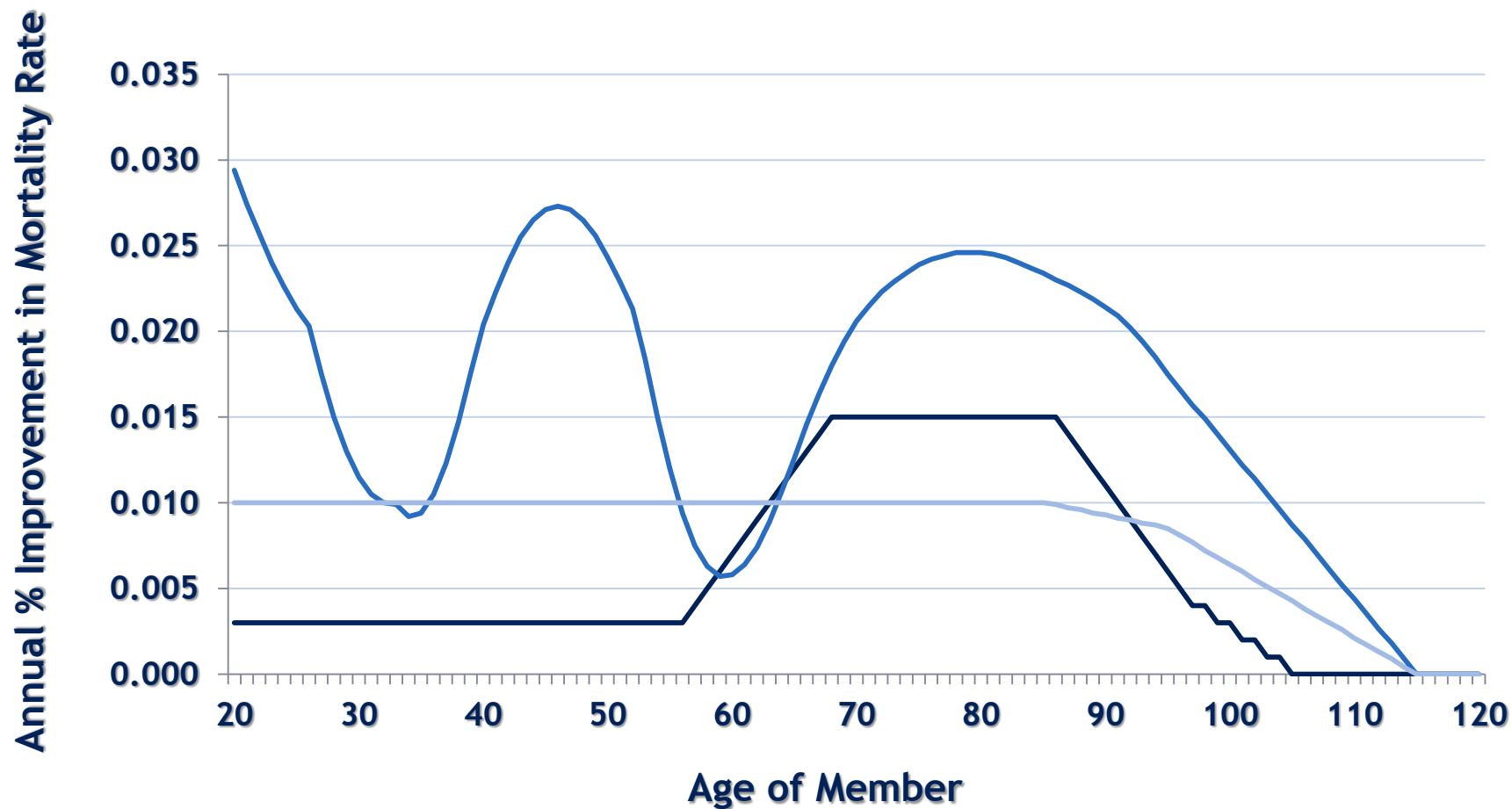
- Proposed 2D scale to replace Scale BB
 - Improvement rates by age and year of birth
- Not yet final; adoption expected later this year
- Theoretical framework patterned after the mortality projections used to develop Scale BB-2D
 - Short-term mortality improvement based on recent experience;
 - Long-term improvement rates based on expert opinion; and
 - Short-term improvement rates blend smoothly into long-term assumption rates over an appropriate transition period

MP-2014 Heat Map – Males



Source: Society of Actuaries.

Comparison Of Updated Assumption To Scale MP-2014 - Males



—Scale BB —MP-2014 Preliminary (2013) —MP-2014 Preliminary (2030+)