Report On Financial Condition And Recommendation On Long-Term Economic Assumptions

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Presentation to: LEOFF Plan 2 Retirement Board

Office of the State Actuary
"Supporting financial security for generations."

September 27, 2017

Today's Presentation

- Highlights of two reports
  - Financial Condition
  - Economic Experience Study
- Link to the full reports included in meeting materials
- No action required at today's meeting

Report On Financial Condition

Satisfies requirement for OSA to report on the financial condition of the state retirement plans (RCW 41.45.030)

Uses a framework and set of tools to assess plan health

Helps decision-makers evaluate the recommended assumption changes from the Economic Experience Study

Framework For Assessing Financial Condition

What's the health of the retirement plans today?

Where is the plan health expected to be in the future?

How can the future look different than expected?

- Risk factors facing the retirement plans

Can some of these risks be managed?

Tools For Assessing Plan Health

- Affordability: ability to provide adequate funding
  - Can members, employers, and the State pay the amount required to fully fund the plans?
  - Is budgeting difficult due to volatility in rates?
- Solvency (funded status)
  - Can the plans pay the benefits that have been earned by members?
  - Are the plans on target to meet future benefit requirements?

Balancing Affordability And Solvency Is Key For Financial Health

Current Contribution Rates Are At Their Highest Level

Total Employer Contribution Rates			
	2013-15 Biennium	2015-17 Biennium	2017-19 Biennium
System	*Collected*	*Collected*	*Adopted*
PERS	9.03%	11.00%	12.52%
TRS	10.21%	12.95%	15.02%
SERS	9.64%	11.40%	13.30%
PSERS	10.36%	11.36%	11.76%
LEOFF	8.41%	8.41%	8.75%
WSPRS	7.91%	8.01%	12.81%

- Past periods of underfunding due to rate and assumption phase-ins
- Members are living longer and that trend is expected to continue
- Investment returns are expected to be lower in the future so additional contributions are required to fund benefits

Pension Contributions Are Larger Portion Of State Budget

- Current level is similar to those in the late 1980's and early 1990's
- Highest level over the past twenty years

Estimated Pension Contributions as a Percent of GF-S Budget							
(Dollars in Millions)	**1990**	**1994**	**2000**	**2005**	**2010**	**2015**	**2016**
Percent of GF-S Budget	**3.4%**	**4.0%**	**2.4%**	**0.6%**	**2.8%**	**3.7%**	**4.3%**

We Use The Funded Status To Measure Solvency

- Funded status compares plan assets to members' earned benefits
- Plan assets reflect past funding plus investment earnings
- Funded status >100% means the plan has more assets than earned benefits

Funded Status Has Declined From The Prior Year

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		
2015	58%	88%	64%	92%	89%	95%	125%	105%	98%	86%
2014	61%	90%	69%	94%	91%	96%	127%	107%	100%	87%

- Decline in funded status reflects lower investment return assumption and recognition of longer life spans
  - Funding these changes were phased-in over several biennia
- All open plans considered on target for full funding
- PERS 1 and TRS 1 require additional contributions (UAAL payment) to get the plans back on track

Plan Financial Health: What Does The Future Hold?

- Will the current measures of plan health continue?
- OSA developed a model that projects future valuation results for 50 years
- Model assumes future experience matches current assumptions
- Analysis shows both affordability and solvency improve

Future Affordability Expected To Improve

- Contribution rates expected to decline to long-term levels
  - Phase-ins complete
  - Cost of benefits for new members generally less than cost for current members
  - PERS 1 and TRS 1 UAAL rates trend down to their rate floors
- Contributions as a percent of General-Fund Budget expected to decline from a high of 5.2% in 2020 to 2.3% in 2035

Contribution Rates Decline After 2019-21 Biennium

Total Employer Contribution Rates				
	2017-19 Biennium	2019-21 Biennium	2021-23 Biennium	2023-25 Biennium
System	*Adopted*	*Projected*	*Projected*	*Projected*
PERS	12.52%	13.05%	11.72%	10.70%
TRS	15.02%	15.09%	13.13%	12.76%
SERS	13.30%	12.97%	11.49%	10.42%
PSERS	11.76%	11.80%	10.81%	10.33%
LEOFF 2	8.75%	8.75%	7.93%	7.98%
WSPRS	12.81%	18.32%	18.08%	16.34%

Future Solvency: All Plans On Target To Reach Full Funding

- Assumes actual experience matches assumptions over long term
- All open plans have a funded status of 95% or higher by 2023
- TRS 1 UAAL projected to be paid off in 2028
- PERS 1 UAAL projected to be paid off in 2030

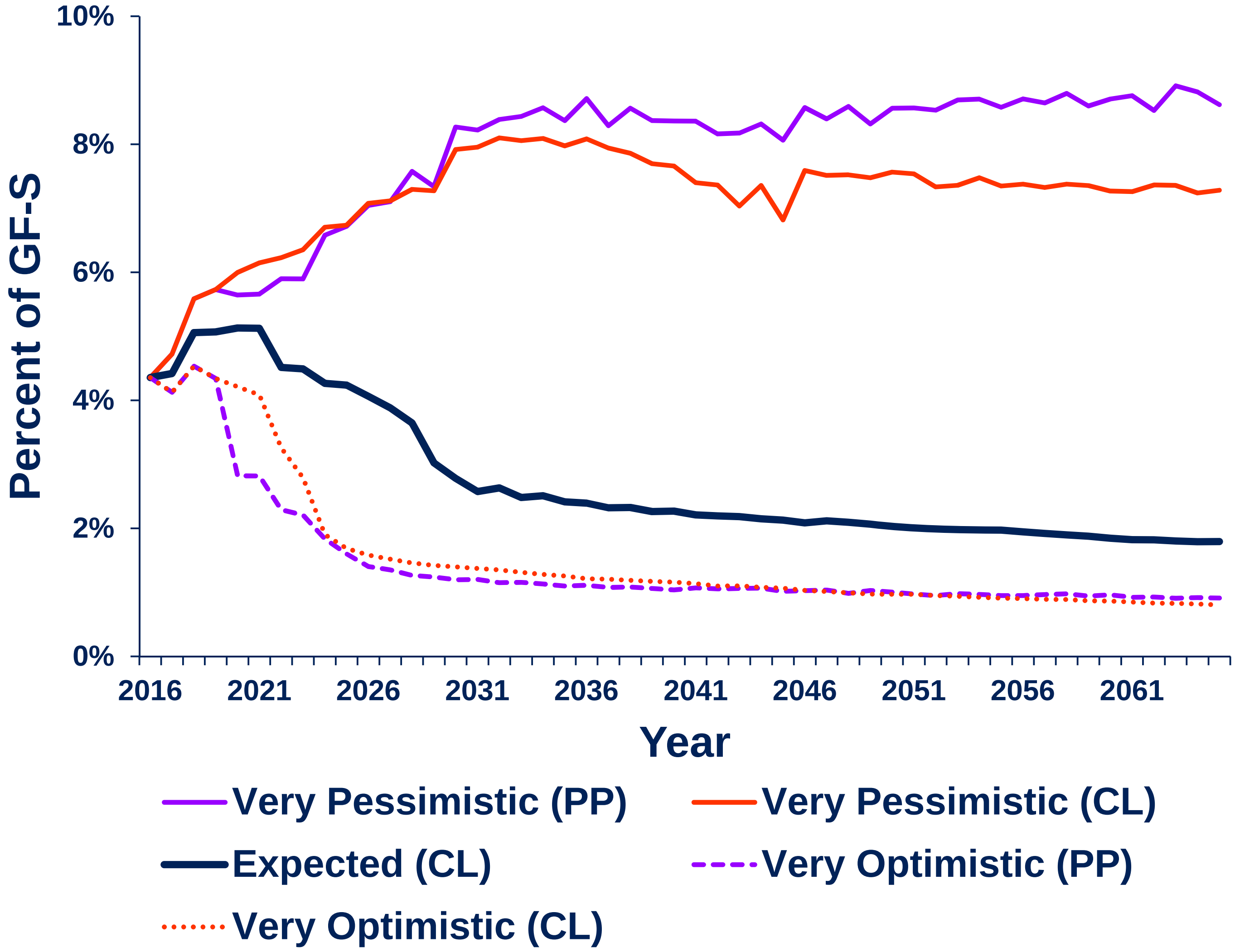
The Future Might Be Different Than We Expect

- Demographics
  - Age, gender, salary, and number of new members
- Investment experience
  - Average returns higher or lower
  - Possible volatile environment
- Legislative action
  - May not fund the required contributions
  - Could adopt new plan benefits or new tiers of benefits

Modeling The Impacts Of Unexpected Experience

- OSA developed a risk assessment model
- Model generates 2,000 scenarios with randomly simulated economic outlooks
- Can assess risks of continuing “past practices”
  - Funding shortfalls and benefit improvements consistent with historical plan experience

Possible Outcomes – Contributions As Percent Of GF-S Budget



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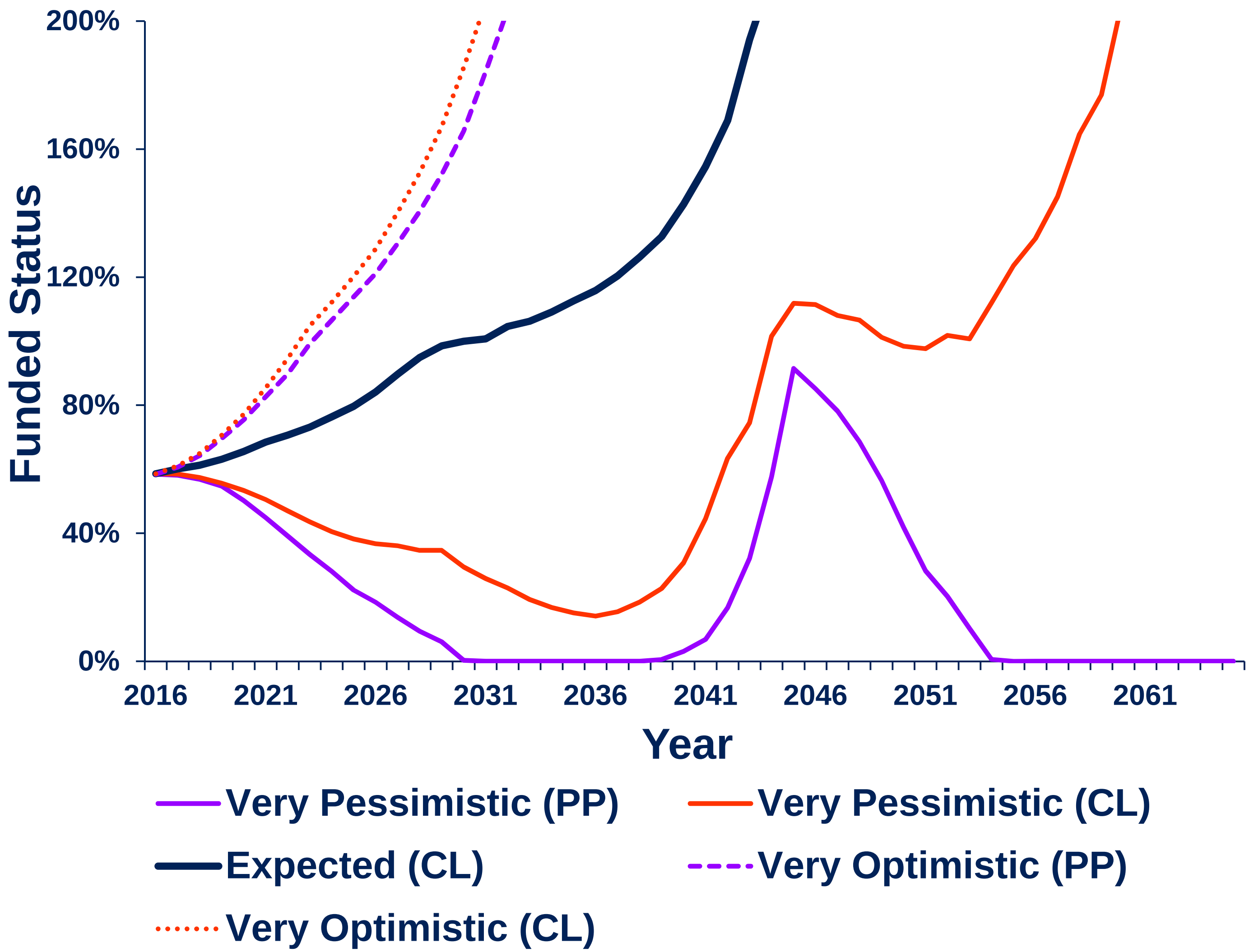
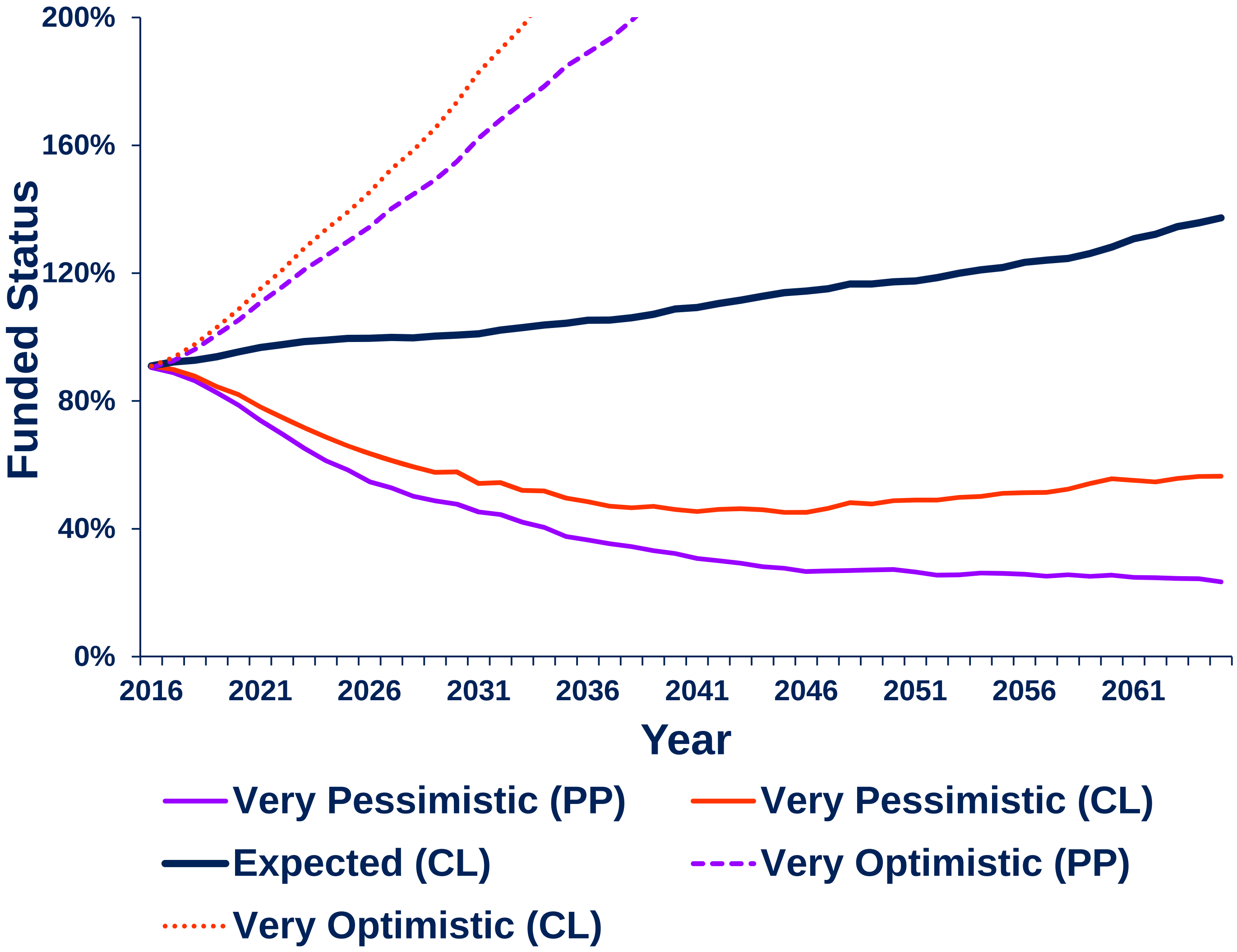
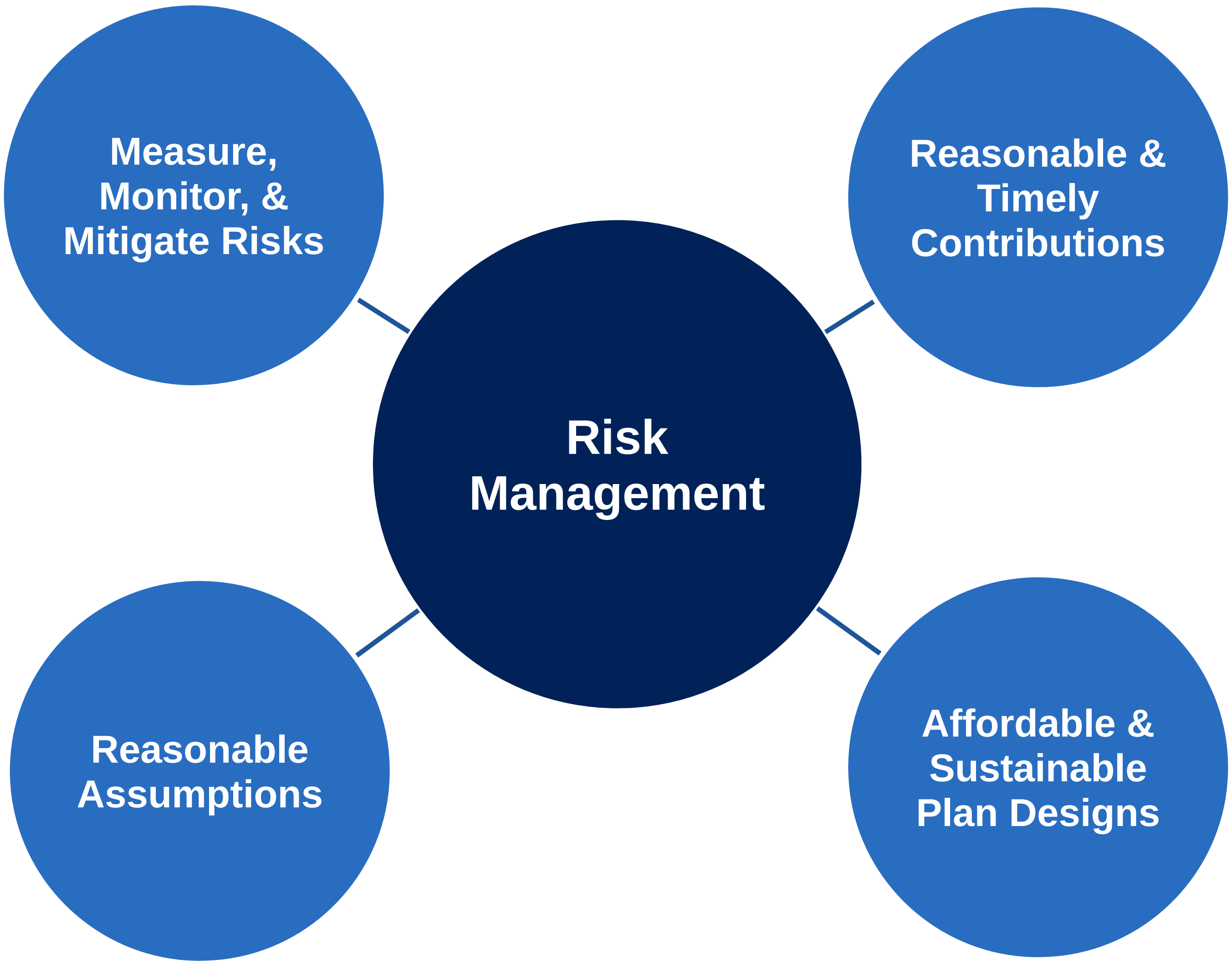
Possible Outcomes – Closed Plan Funded Status



Possible Outcomes – Open Plan Funded Status



Managing Risks We Can Control



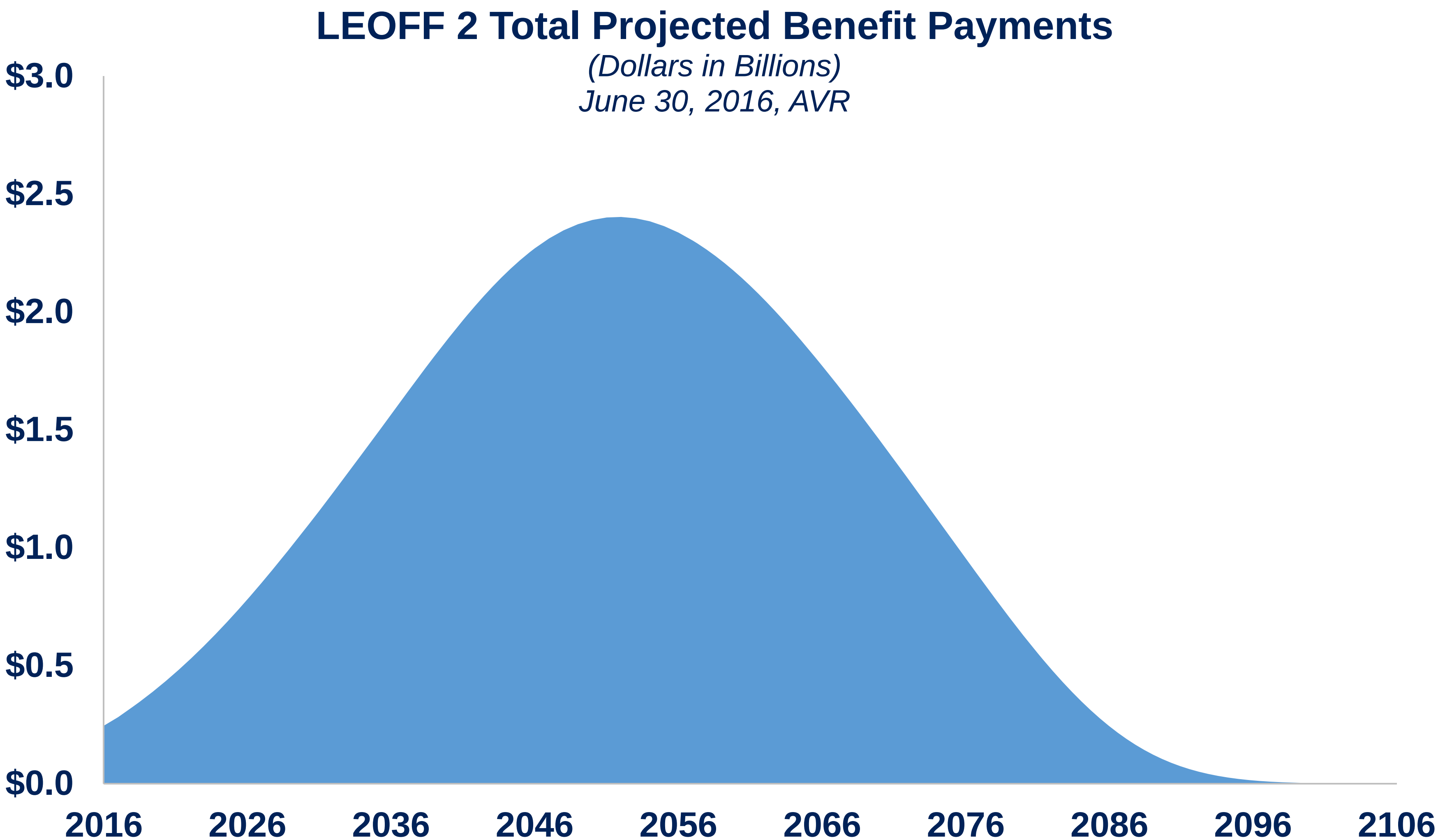
Report On Financial Condition: Concluding Comments

- Current pressure on affordability and solvency
  - Contribution rates are the highest in plan history
  - Funded status has declined
- Future measures of plan health expected to improve
- Balancing affordability and solvency is key since improving one measure usually weakens the other
- Managing pension risks requires:
  - Regular monitoring
  - Making necessary adjustments
  - Applying discipline to fully fund the required contributions

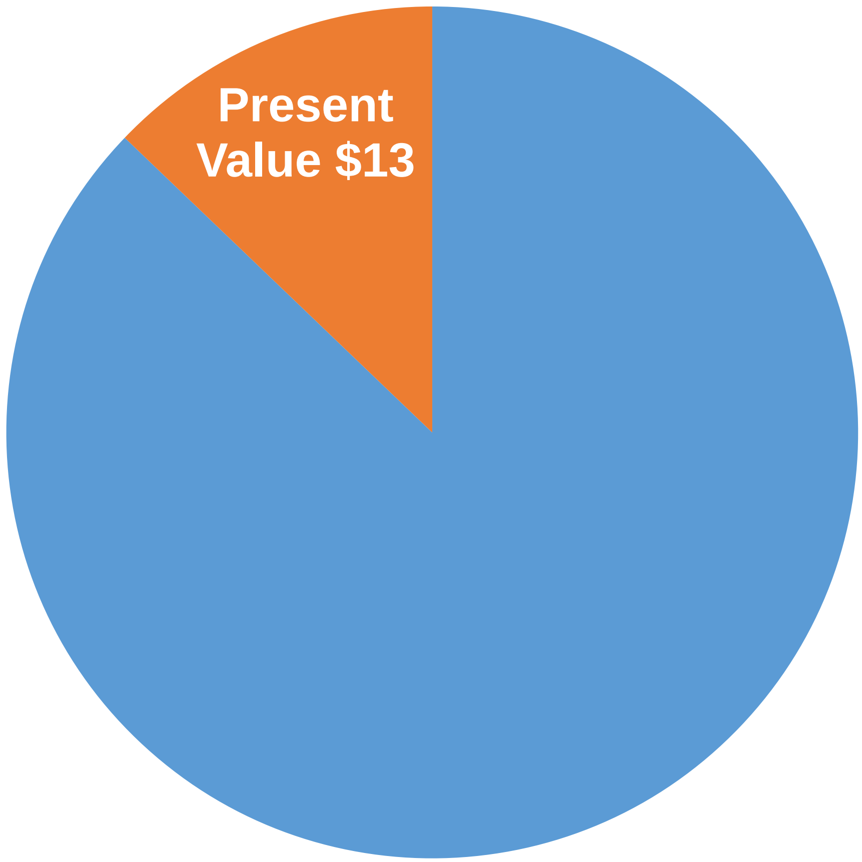
Economic Assumptions: Purpose And Measurement Period

- Before we dive in, let's first clarify two things
- Purpose of the assumptions
  - Assumptions are set consistent with the purpose of the measurement
  - Used to determine the on-going funding requirements of the plans consistent with the state's funding policy in Chapter 41.45 RCW
- Measurement period
  - Varies by assumption, but most are long-term assumptions
  - Easily 30 to 50 plus years
- Have a different measurement or period in mind? Use different assumptions!

We're Setting Assumptions To Fund This ...



We Reduce Future Pension Costs By Assumed Future Earnings



Total = $101 Billion

What Are The Assumptions In This Study?

Assumption	Use of Assumption
Inflation	Model post-retirement COLAs based on changes in Consumer Price Index (CPI) for Seattle, Tacoma, Bremerton Building block for other assumptions
General Salary Growth	Project salaries to determine future retirement benefits and contribution rates as a percentage of payroll
Investment Return	Determine today's value of future benefit payments and salaries

General Assumption Setting Process

1. Review Historical Data

2. Review Forecasts

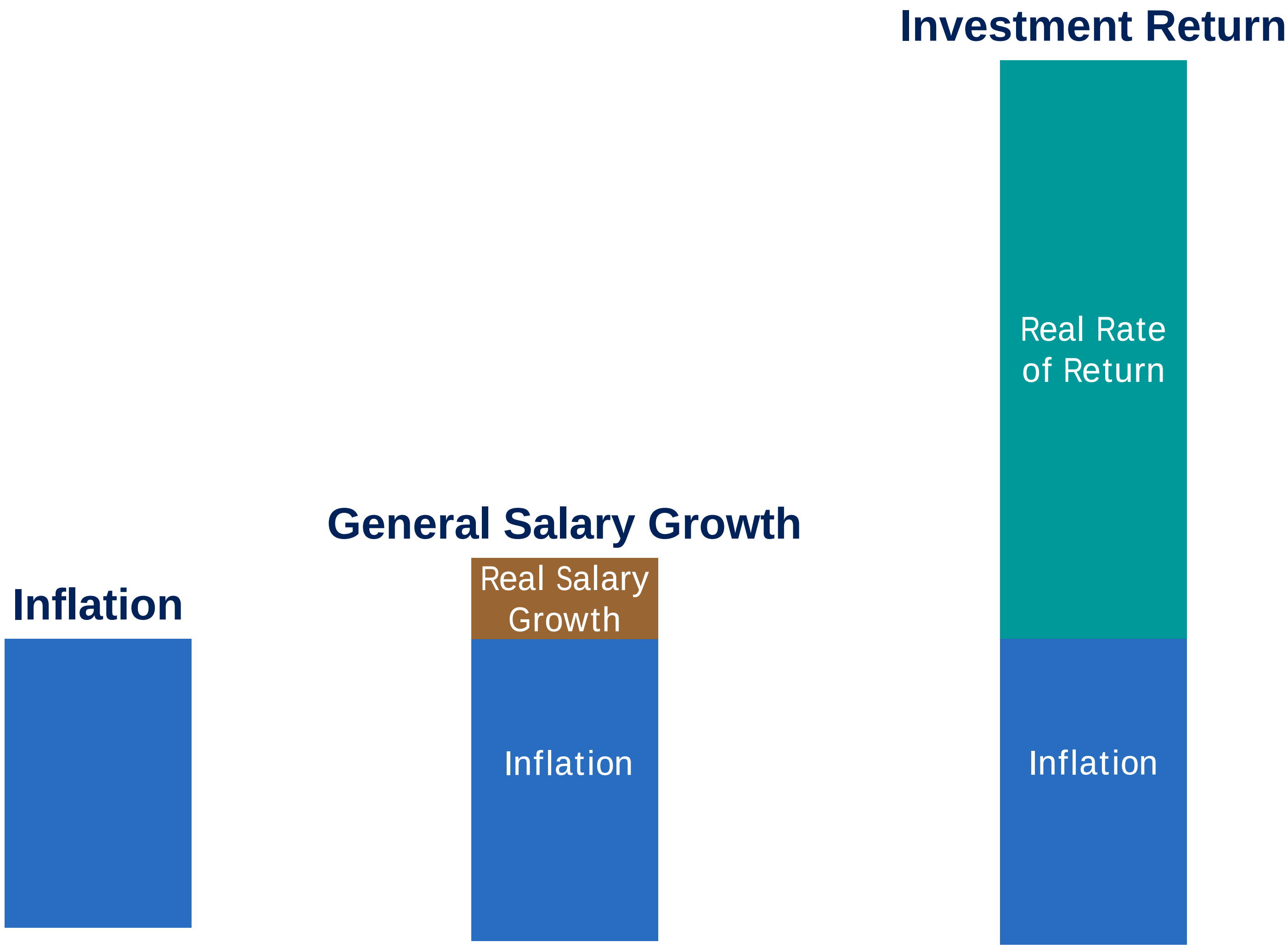
3. Review More Forecasts

4. Recommend Assumption

Wait, One More Thing!

- We developed these assumptions as a consistent set of economic assumptions and recommend reviewing them as a set of assumptions
- No cherry picking please!

It All Starts With Inflation



Inflation

Historical Data

Inflation has remained low for the past few decades

Forecasts

Short-term: maintain low levels

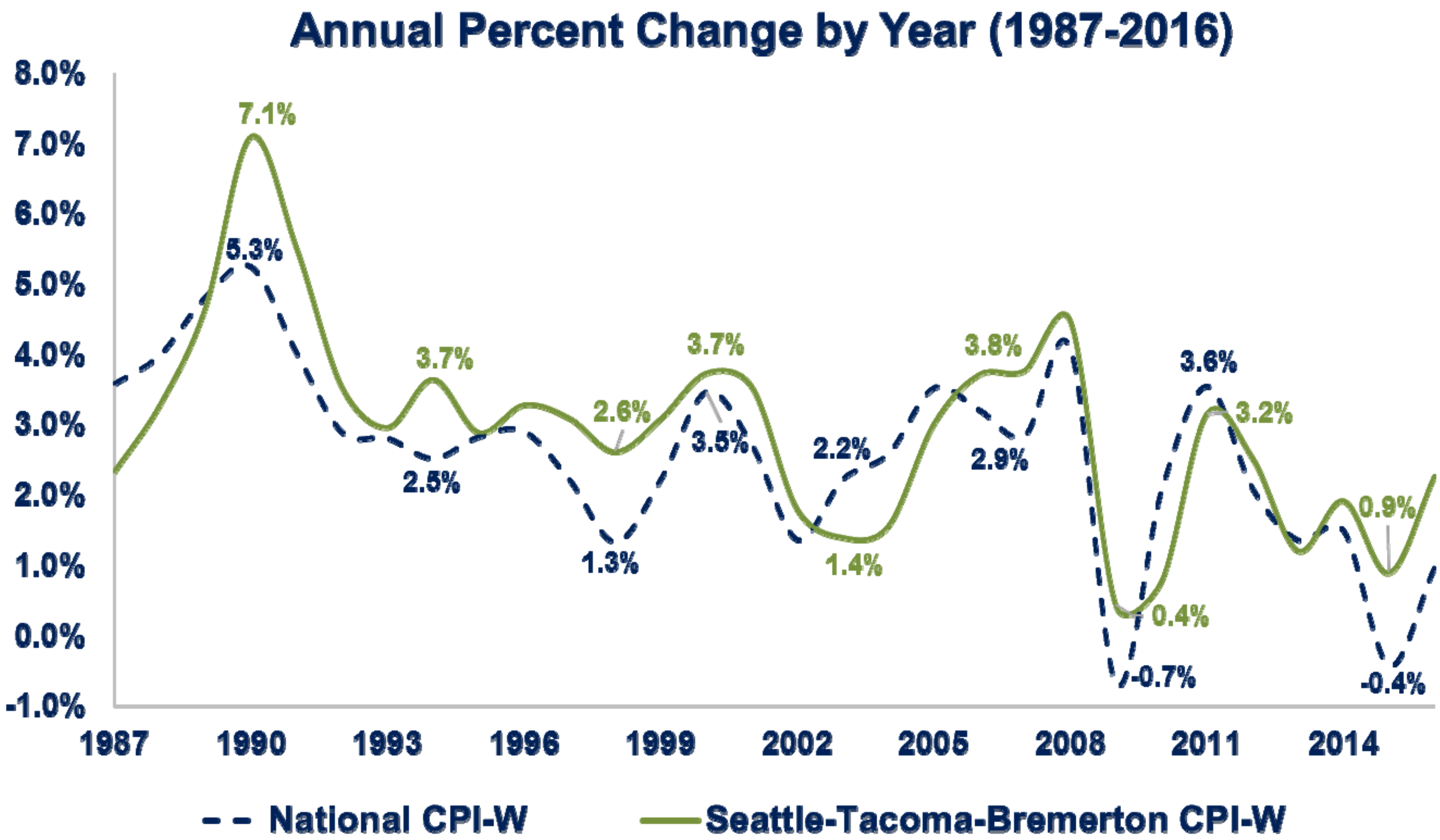
Long-term: typically higher due to uncertainty over longer forecasting period

Recommendation

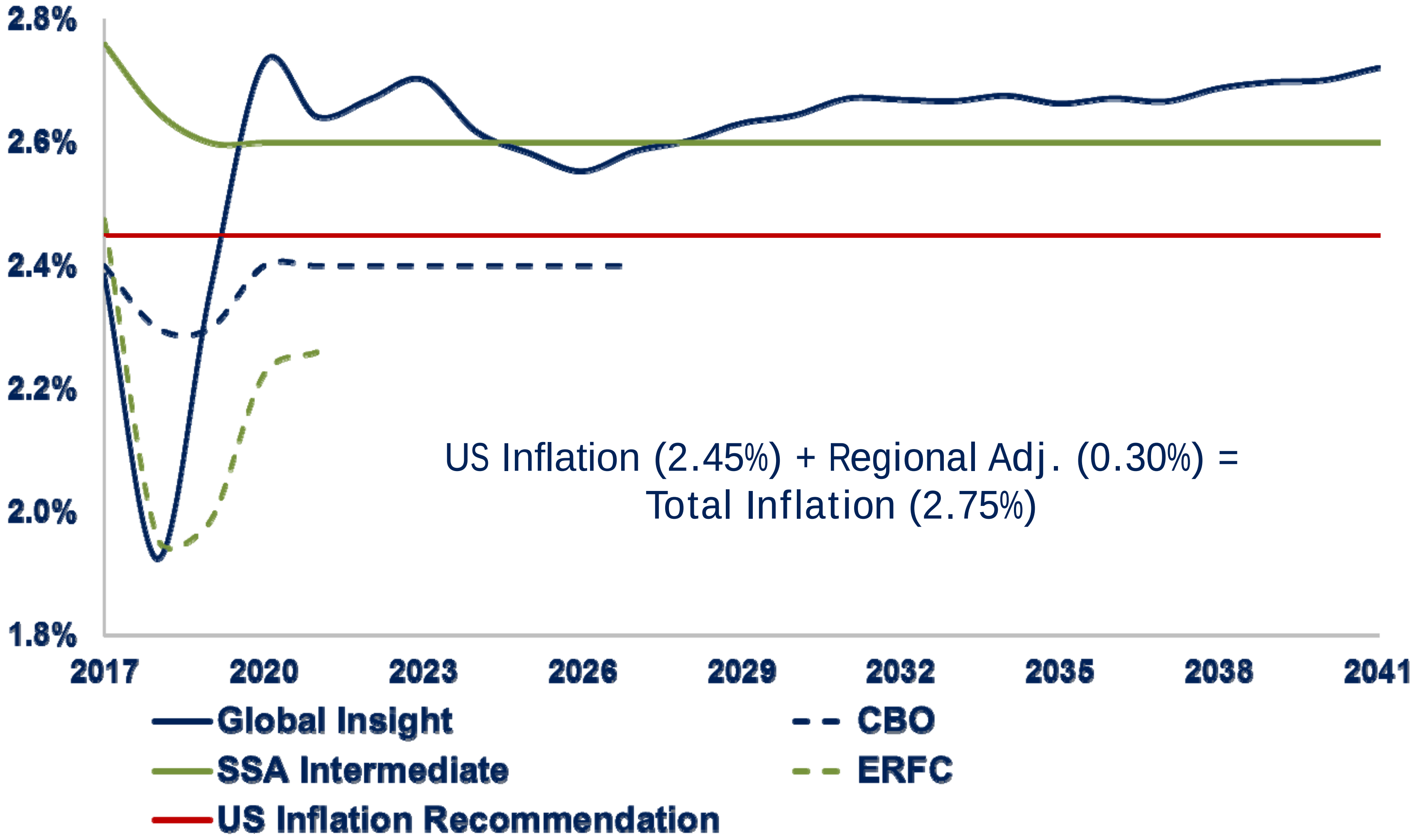
Lower from 3.00% to 2.75%

2.75% = 2.45% (national) + 0.30% (regional adjustment)

Low Inflation Persists



Recommendation For National CPI Consistent With Forecasts



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Real Salary Growth (Salary Growth Above Inflation)

Historical Data

Holding steady after considering impact of outliers

We isolated economic growth factors in Plan 2/3 salary growth data

Forecasts

Short-term: CBO projects 1.2% for next 10 years

Long-term: SSA projects 1.2% for next 75 years

Forecasts include both economic and demographic growth factors; virtually unchanged from two years ago

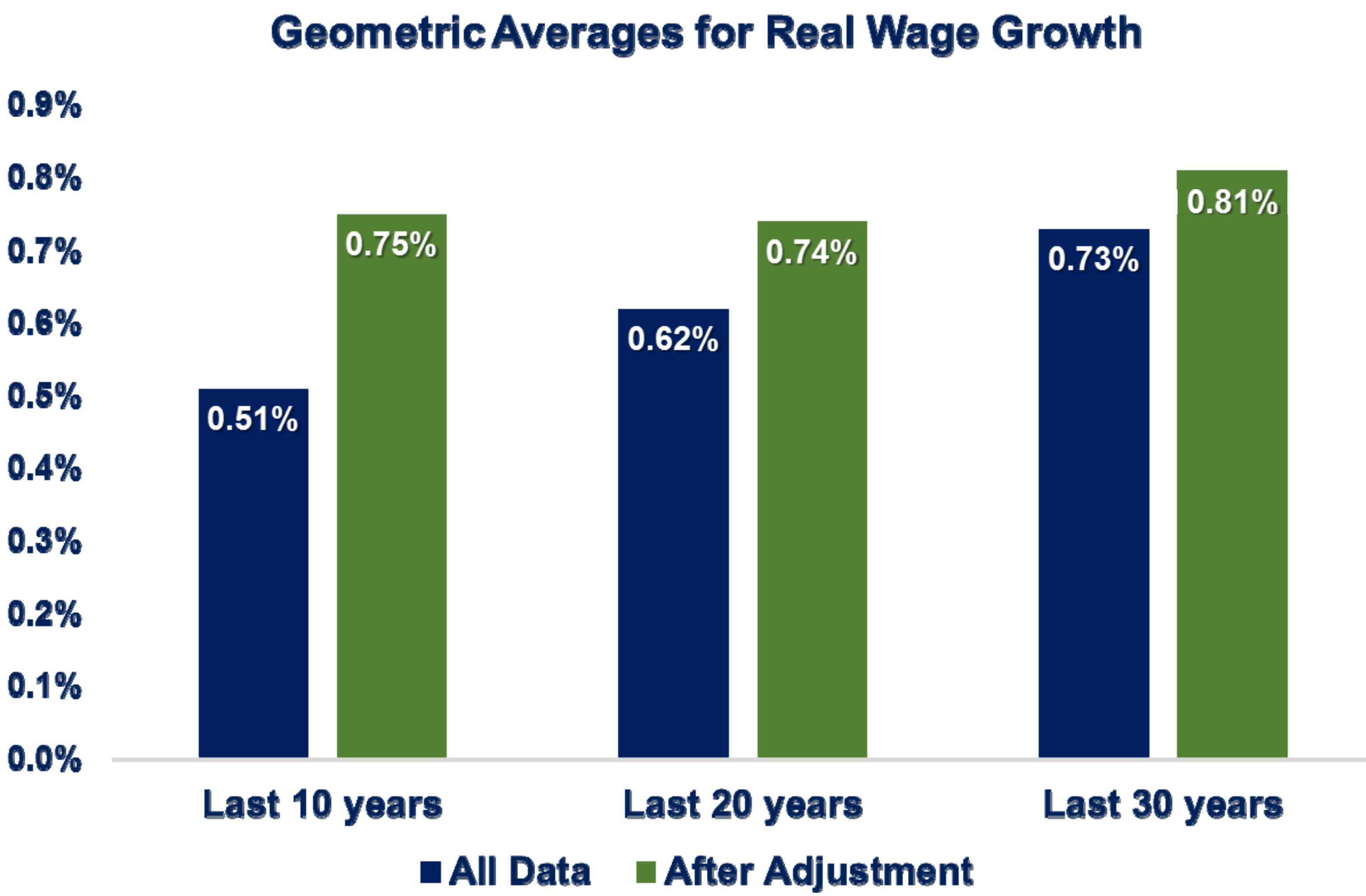
Recommendation

No change; remain at 0.75%

Lower general salary growth from 3.75% to 3.50%

3.50% = 2.75% (inflation) + 0.75% (real salary growth)

Plan 2/3 Real Salary Growth Holding Steady After Adjusting For Outliers



Investment Return

Historical Data

Actual average returns for the last 10 and 20 years fell below currently assumed rate

Forecasts

Based on new Capital Market Assumptions, WSIB expects lower returns for next 15 years than previously expected

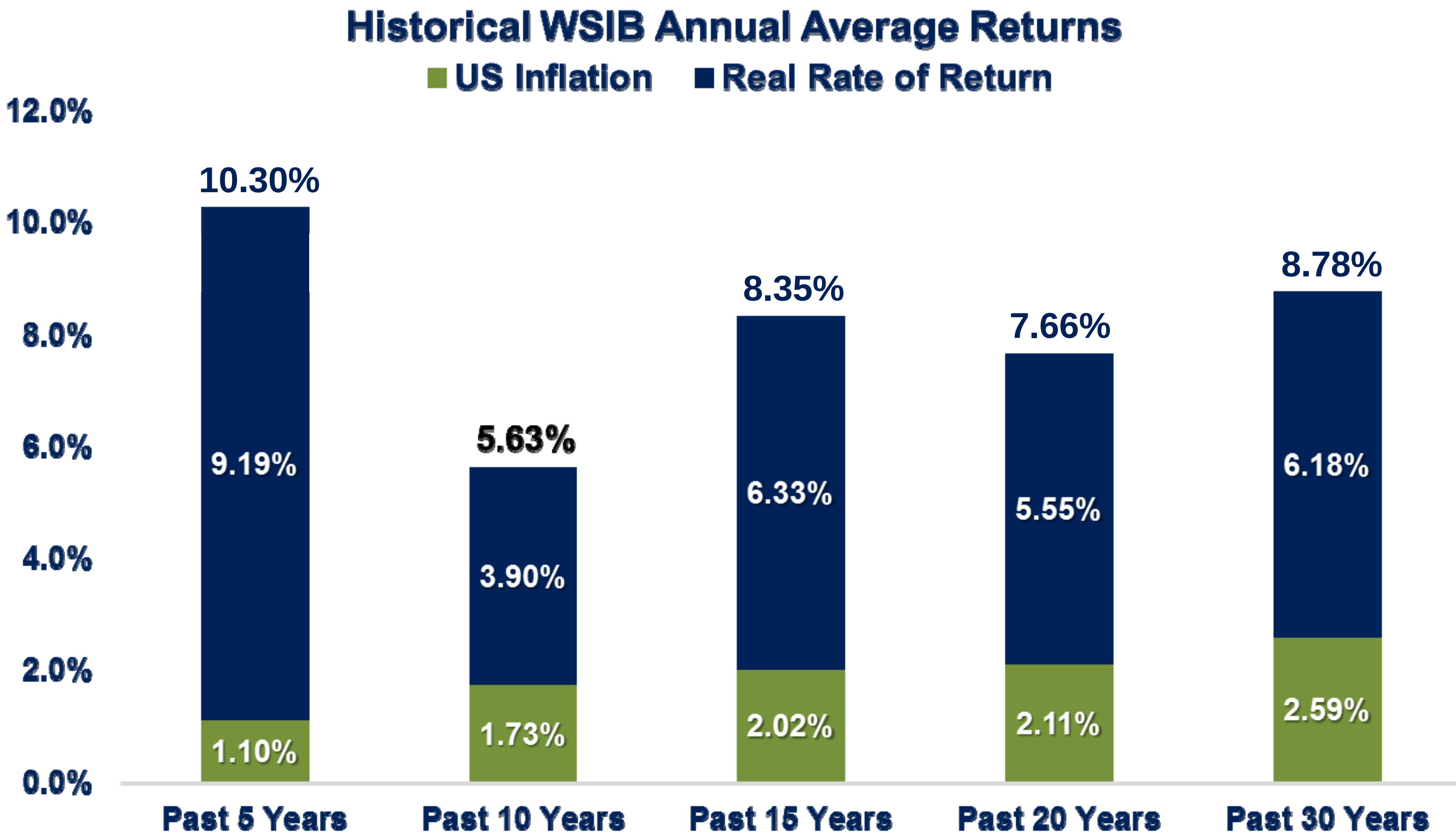
We applied our professional judgment to extend WSIB's return expectations beyond 15 years

Recommendation

Lower from 7.50% to 7.40%

7.40% = 2.45% (national inflation) + 4.95% (real ROR)

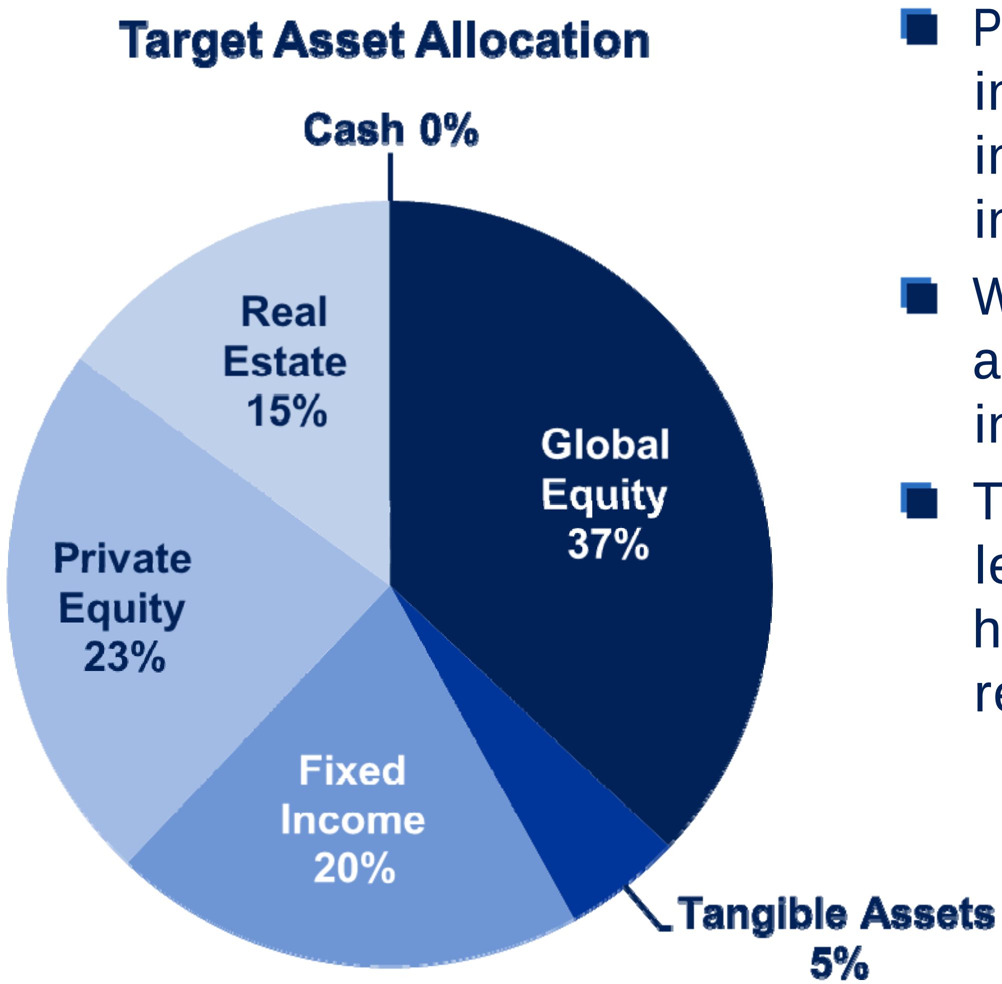
Average Annual Returns For Past 10 And 20 Years Below Current Assumption



Source: Washington State Investment Board. Returns restated for 1993 and beyond.

Note: Totals may not agree due to rounding.

Asset Allocation Matters



- Public pension plans don't all invest the same way and most invest in private market investments
- WSIB invests a higher allocation to private market investments than peers
- This higher allocation typically leads to higher returns and higher standard deviation of returns

WSIB Expects Lower Future Returns Than Previously Assumed

50-Year Simulated Future Investment Returns*			
	2017	**2015**	**Difference**
75th Percentile	8.57%	8.86%	(0.29%)
55th Percentile	7.58%	7.94%	(0.36%)
Median Return	**7.34%**	**7.74%**	**(0.40%)**
45th Percentile	7.11%	7.54%	(0.43%)
25th Percentile	6.08%	6.56%	(0.48%)

**Source: Washington State Investment Board.*

- Using 1-year expected returns and standard deviations, we can simulate returns over the next 50 years
- Half the simulated returns fall below (or above) the "Median Return"
- Actual returns are uncertain and will vary from the simulations

Simulated Returns Change When We Use Different Assumptions

50-Year Simulated Annual Investment Returns Sensitivity Analysis					
		Private Equity Expected Return		Global Equity Expected Return	
	Base	(1%)	1%	(1%)	1%
75th Percentile	8.57%	8.34%	8.80%	8.20%	8.94%
Median Return	**7.34%**	**7.11%**	**7.57%**	**6.97%**	**7.71%**
25th Percentile	6.08%	5.85%	6.32%	5.71%	6.46%

- Private and global equity represent the two largest asset classes
- If we assume 1% lower/higher global equity returns, the median return falls/increases from 7.34% to 6.97/7.71%
- If we assume 1% lower/higher private equity returns, the median return falls/increases from 7.34% to 7.11/7.57%

Landing On The Return Recommendation

1. Review Historical Data

Review CTF performance

Consider historical conditions and whether those conditions exist now or will in the future

2. Review Simulations

Provided by WSIB based on 15-year CMAs and 2.20% inflation assumption

Assumed PE returns 300 basis points above global equity

3. Review Simulations with Different Assumptions

Simulated CTF returns most sensitive to lower/higher global equity returns

4. Make Adjustments

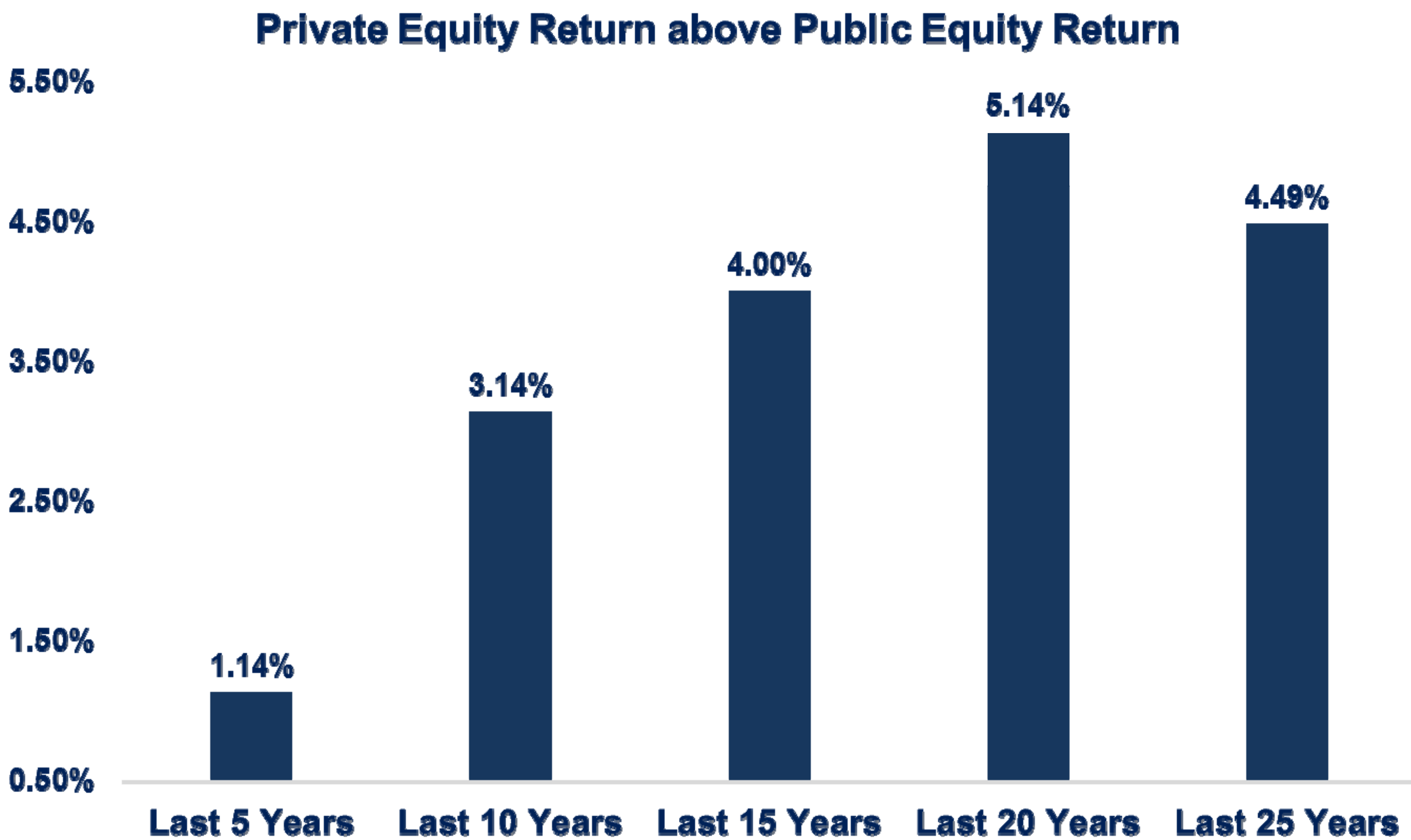
Increase returns by 0.25% to account for higher OSA inflation assumption (2.45% - 2.20%)

Decrease returns for lower expected long-term PE returns

Wait ... Tell Me More About Those Adjustments

- Inflation adjustment
  - WSIB assumes lower national inflation for a shorter, 15-year time horizon
  - OSA assumes higher national inflation for a longer time horizon
  - We added 0.25 percentage points to WSIB simulated returns to equalize our inflation assumptions
  - Adjustment ensures our assumption set remains consistent
- Private equity (PE) adjustment
  - WSIB assumes PE returns will exceed global equity returns by 300 percentage points, on average, over the next 15 years
  - We think that's a reasonable assumption for the next 15 years
  - We expect lower PE returns beyond the next 15 years due to increased efficiency and competition, and the general continued evolution of the PE market

WSIB Excess/Premium Of Private Equity Over Public Equity Returns Has Declined



Pulling It All Together

Median 50-Year Return	+	0.25%	↑	for Inflation	=	7.59%
1% Lower PE Returns	+	0.25%	↑	for Inflation	=	7.36%

- Inflation adjustment increases simulated 50-year median return from 7.34% to 7.59%
- Private equity adjustment lowers inflation-adjusted median return from 7.59% to 7.36%
- Recommend long-term rate of return assumption of 7.40%

Summary Of Report On Long-Term Economic Assumptions

Assumption	Current	Recommended
Inflation	3.00%	2.75% ⬇
General Salary Growth	3.75%	3.50% ⬇
Annual Investment Return	7.50%	7.40% ⬇

- We developed these assumptions as a consistent set of economic assumptions and recommend reviewing them as a set of assumptions
- Adopting recommendation will improve long-term system health measures, but weaken short-term affordability

Estimated Contribution Rate Impact Adopting All Assumption Changes

LEOFF 2 - Contribution Rate Change		
	Aggregate Method	100% EAN Method
Employee	(0.73%)	(0.27%)
Employer	(0.44%)	(0.16%)
State	(0.29%)	(0.11%)

- The Board has already adopted contribution rates for the 2017-2021 biennia equal to 100% of EAN
- Contribution rate changes above provide an estimate of how those rates could be different
  - Aggregate method represents statutory funding method
  - EAN method represents the Board's current policy

2019-21 Estimated Budget Impact – Adopting All Assumptions Changes With No Phase-In

Increase in Contributions from Adopting Full Recommendation*							
(Dollars in Millions)	**PERS**	**TRS**	**SERS**	**PSERS**	**LEOFF**	**WSPRS**	**Total**
2019-2021							
General Fund	$24.4	$69.3	$10.9	$1.6	($11.4)	$0.1	$94.9
Non-General Fund	36.7	0.0	0.0	0.2	0.0	1.8	38.7
Total State	**$61.1**	**$69.3**	**$10.9**	**$1.8**	**($11.4)**	**$1.9**	**$133.6**
Local Government	69.4	28.3	13.5	2.0	(17.1)	0.0	96.1
Total Employer	**$130.5**	**$97.5**	**$24.4**	**$3.8**	**($28.6)**	**$1.9**	**$229.7**
Total Employee	**$50.7**	**$9.4**	**$5.6**	**$1.5**	**($28.6)**	**$0.1**	**$38.8**

Totals may not agree due to rounding.

**In current law, we assume 7.70% rate of return for the 2019-21 Biennium. This table displays the cost in the 2019-21 Biennium from lowering the assumed rate of return from 7.7% to 7.4%, lowering the general salary growth assumption from 3.75% to 3.5%, and lowering the inflation assumption from 3% to 2.75%. Short-term costs would continue beyond 2019-21 and ultimately become a long-term savings. We estimated the 2019-21 impact by applying the change in contribution rates from the 2015 AVR to projected payroll. Actual impacts may vary from this estimate.*

2021-23 Estimated Budget Impact – Adopting All Assumptions Changes With No Phase-In

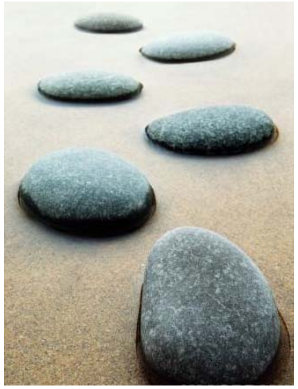
Increase in Contributions from Adopting Full Recommendation*							
(Dollars in Millions)	**PERS**	**TRS**	**SERS**	**PSERS**	**LEOFF**	**WSPRS**	**Total**
2021-2023							
General Fund	$24.9	$74.4	$11.0	$1.7	($11.6)	$0.1	$100.5
Non-General Fund	37.4	0.0	0.0	0.2	0.0	1.8	39.3
Total State	**$62.2**	**$74.4**	**$11.0**	**$2.0**	**($11.6)**	**$1.9**	**$139.9**
Local Government	70.7	30.4	13.7	2.1	(17.4)	0.0	99.5
Total Employer	**$132.9**	**$104.9**	**$24.7**	**$4.1**	**($29.1)**	**$1.9**	**$239.4**
Total Employee	**$48.7**	**$10.7**	**$5.5**	**$1.6**	**($29.1)**	**$0.1**	**$37.6**

Totals may not agree due to rounding.

**In current law, we assume 7.70% rate of return for the 2021-23 Biennium. This table displays the cost in the 2021-23 Biennium from lowering the assumed rate of return from 7.7% to 7.4%, lowering the general salary growth assumption from 3.75% to 3.5%, and lowering the inflation assumption from 3% to 2.75%. Short-term costs would continue beyond 2021-23 and ultimately become a long-term savings. We estimated the 2021-23 impact by applying the change in contribution rates from the 2015 AVR to projected payroll. Actual impacts may vary from this estimate.*

Next Steps

- LEOFF 2 Board has authority to adopt recommendations for economic assumptions
  - Any changes subject to revision by the Legislature



Appendix

- Estimated 2019-21 contribution rate impacts
- Other states' economic assumptions

Estimated 2019-21 Contribution Rate Impact Adopting All Assumption Changes With No Phase-In

Increase in Contribution Rates from Adopting Full Recommendation* (Effective 7/1/2019)						
	PERS	**TRS**	**SERS**	**PSERS**	**LEOFF**	**WSPRS**
Employee (Plan 2)	**0.37%**	**0.35%**	**0.37%**	**0.22%**	**(0.73%)**	**0.00%**
Employer						
Current Annual Cost	0.37%	0.35%	0.37%	0.22%	(0.44%)	1.15%
Plan 1 Past Cost	0.30%	0.50%	0.30%	0.30%	0.00%	0.00%
Total Employer	**0.67%**	**0.85%**	**0.67%**	**0.52%**	**(0.44%)**	**1.15%**

**In current law, we assume 7.70% rate of return beginning in the 2019-21 Biennium. This table displays the rate impacts from lowering the assumed rate of return from 7.7% to 7.4%, lowering the general salary growth assumption from 3.75% to 3.5%, and lowering the inflation assumption from 3% to 2.75%. Short-term impacts would continue beyond 2019-21 and ultimately become a long-term savings. We estimated the impact with the change in contribution rates from the 2015 AVR to projected payroll. Actual impacts may vary from this estimate.*

Other States' Economic Assumptions

Economic Assumptions for Selected Plans Outside Washington[1]

Plan Name[2]	Investment Return	General Salary Growth	Real Salary Growth[3]	Inflation
WA 2017 Economic Experience Study Recommendation	7.40%	3.50%	0.75%	2.75%
Alaska Public Employees Retirement System	8.00%	3.62%	0.50%	3.12%
Alaska Teachers Retirement System	8.00%	3.62%	0.50%	3.12%
California Public Employees Retirement System	7.50%	3.00%	0.25%	2.75%
California State Teachers Retirement System	7.50%	3.75%	0.75%	3.00%
Public Employees Retirement Association of Colorado (State & School Divisions)	7.25%	3.50%	1.10%	2.40%
Florida Retirement System	7.60%	3.25%	0.65%	2.60%
Iowa Public Employees Retirement System	7.50%	4.00%	1.00%	3.00%
Public Employees Retirement System of Idaho	7.00%	3.75%	0.50%	3.25%
Missouri State Employees Retirement System	7.65%	3.00%	0.50%	2.50%
Ohio Public Employees Retirement System	7.50%	3.25%	0.75%	2.50%
Oregon Public Employees Retirement System	7.50%	3.50%	1.00%	2.50%
Wisconsin Retirement System[4]	7.20%	3.20%	N/A	2.00%-2.70%
Selected Public Plans Outside WA - Average	**7.52%**	**3.45%**	**0.68%**	**2.79%**
Selected Public Plans Outside WA - Minimum	**7.00%**	**3.00%**	**0.25%**	**2.40%**
Selected Public Plans Outside WA - Maximum	**8.00%**	**4.00%**	**1.10%**	**3.25%**

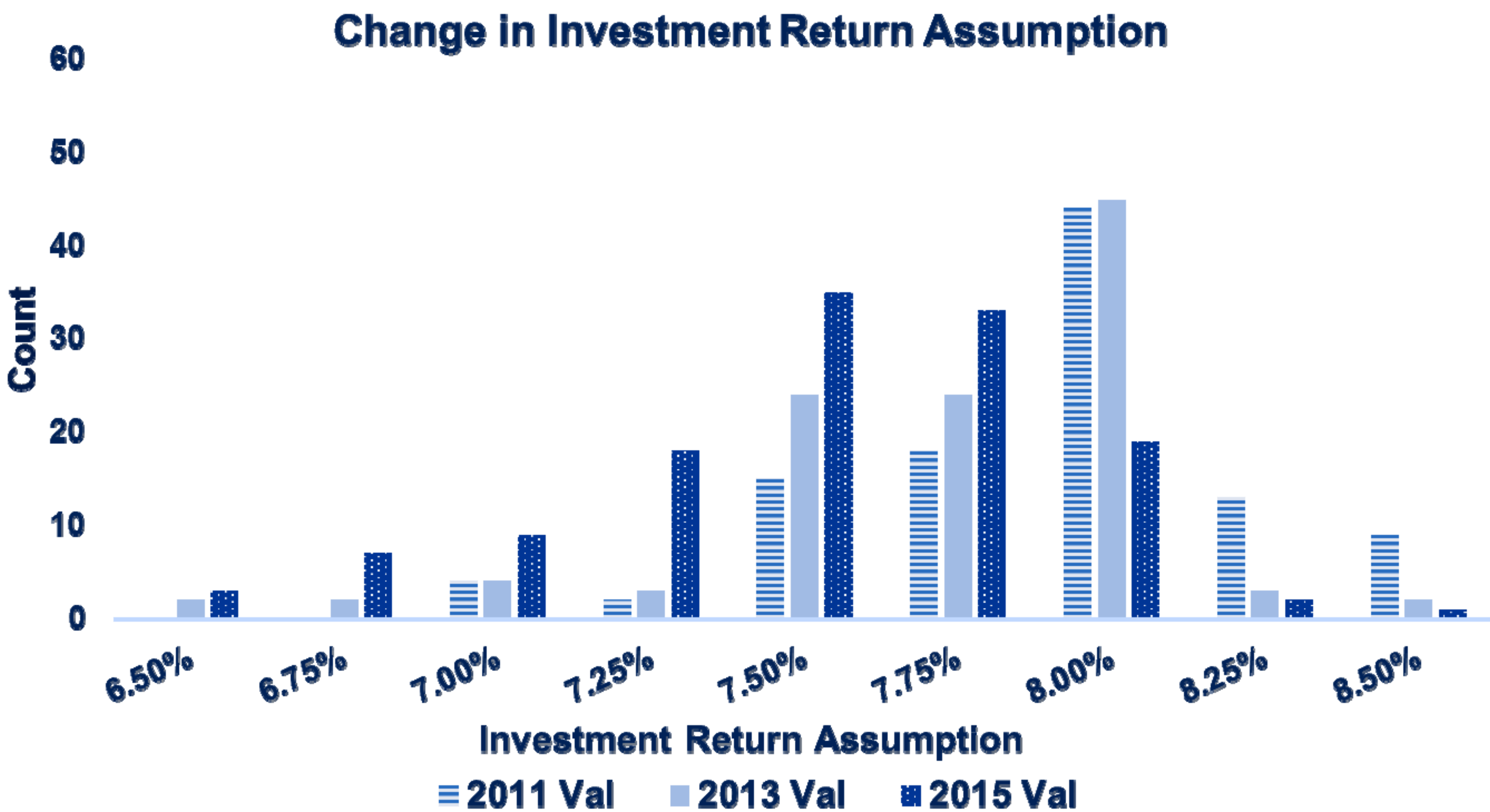
[1]Assumptions are developed according to individual plan needs for use in a variety of actuarial models. Additional assumptions may be used, in combination with the reported general salary growth assumption, to model total salary growth. Investment return assumptions are heavily dependent on the plan's asset allocation.

[2]Data gathered from Public Plans Database, Center for Retirement Research, and individual state system Comprehensive Annual Financial Reports or Actuarial Valuations.

[3]For comparison to our economic assumptions. We assumed real salary growth was the difference between General Salary Growth and Inflation.

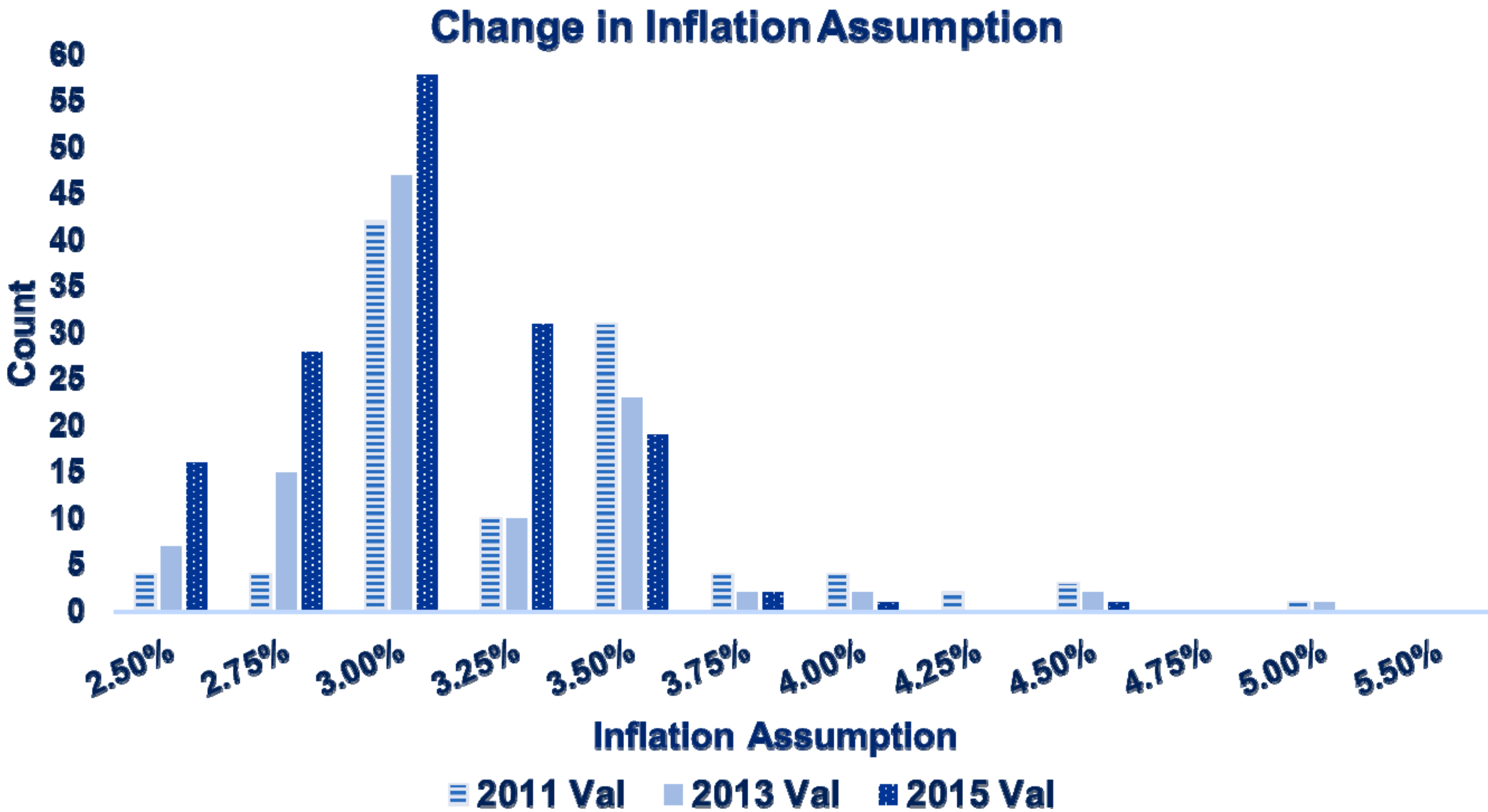
[4]Data gathered from WRS' 2015 Comprehensive Annual Financial Report, published March 31, 2017.

Other States' Economic Assumptions



Source: NASRA Public Fund Survey.

Other States' Economic Assumptions



Source: Data gathered from Public Plans Database, Center for Retirement Research, and NASRA Public Fund Survey.