



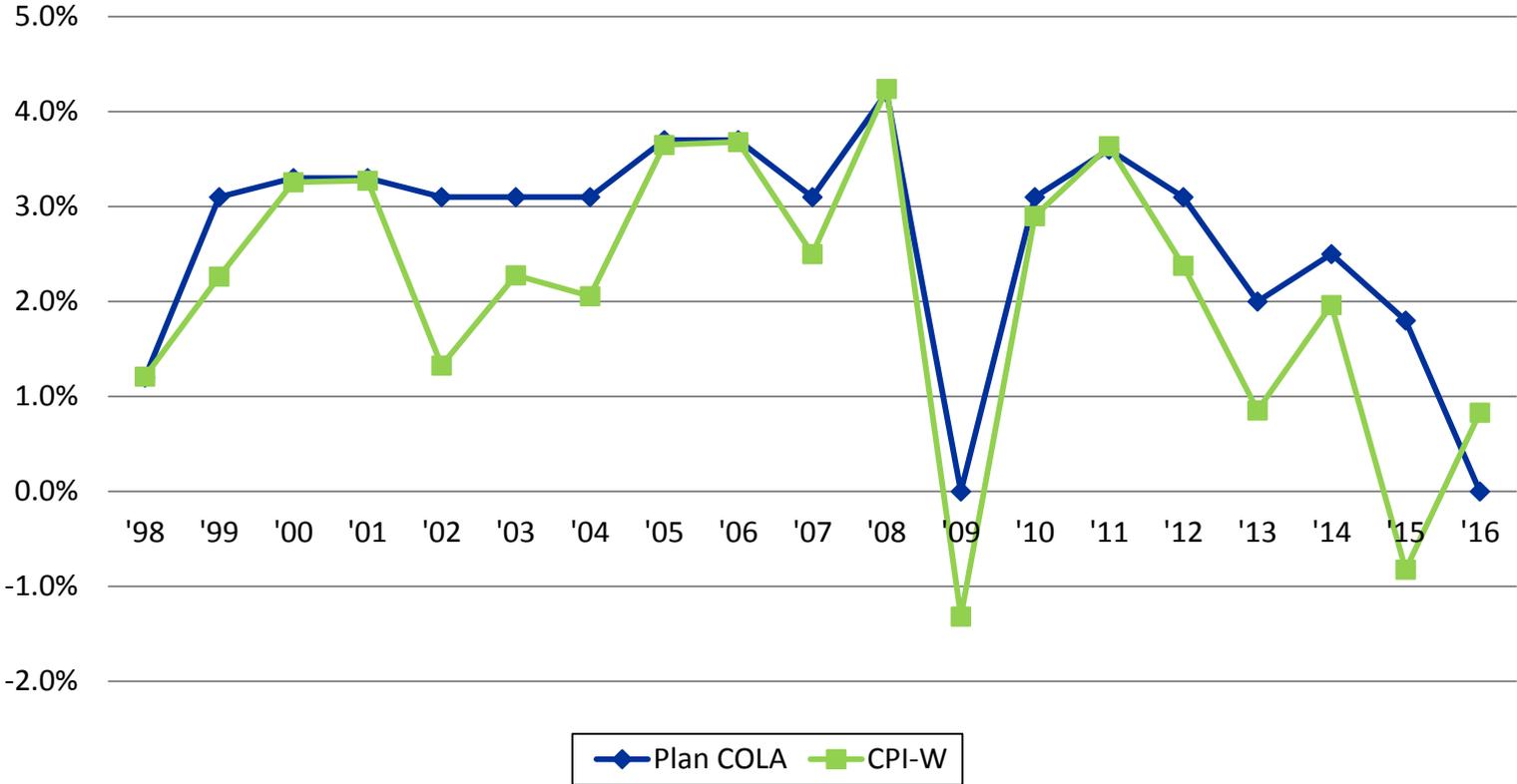
South Dakota Department of Labor Retirement Plan

Cost of Living Adjustments and Annuity Purchase Rates On-Demand Actuarial Projection Model

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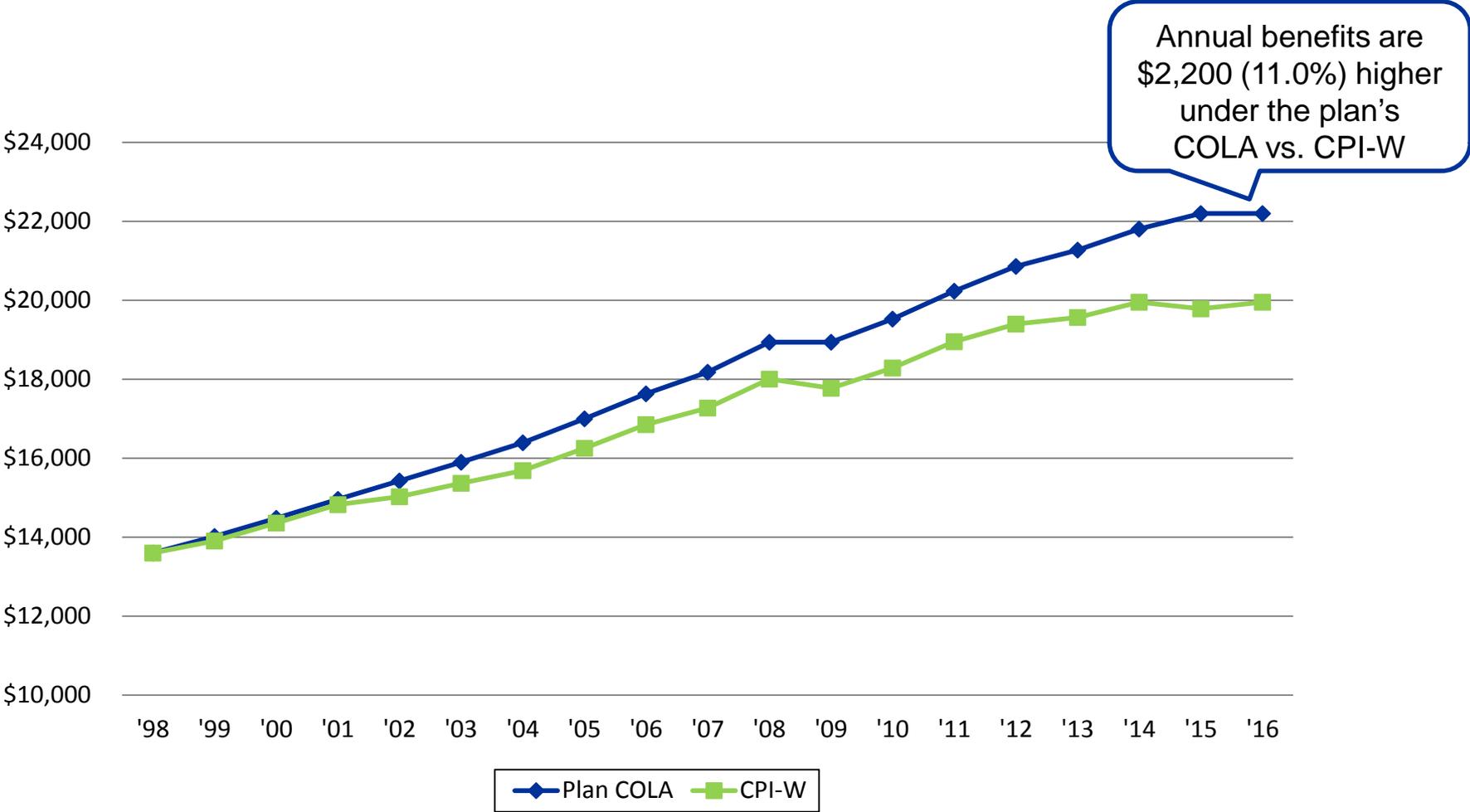
Historical COLA

Comparison of Actual COLA Rates to Inflation (CPI-W in April)



Sample Annual Benefit for pre-1999 Retiree*

Comparing Actual COLA paid to Inflation (CPI-W)



*Sample retiree with \$22,200 annual benefit as of July 1, 2015

Sensitivity of Purchasable COLA

On-Demand Actuarial Projection Model

Projection Model Variables

- Annuity Purchase Rate by year
- COLA paid by year (if different than calculated amount)
- Asset Return assumption (Mean, 5th%, 25th%, 75th%)*
- Settlement Year

Sample Results

- The following slides show a selection of results from the projection model under various Annuity Purchase Rates
- All projections are based on the Mean Asset Return assumption and a settlement date of 2034 or later

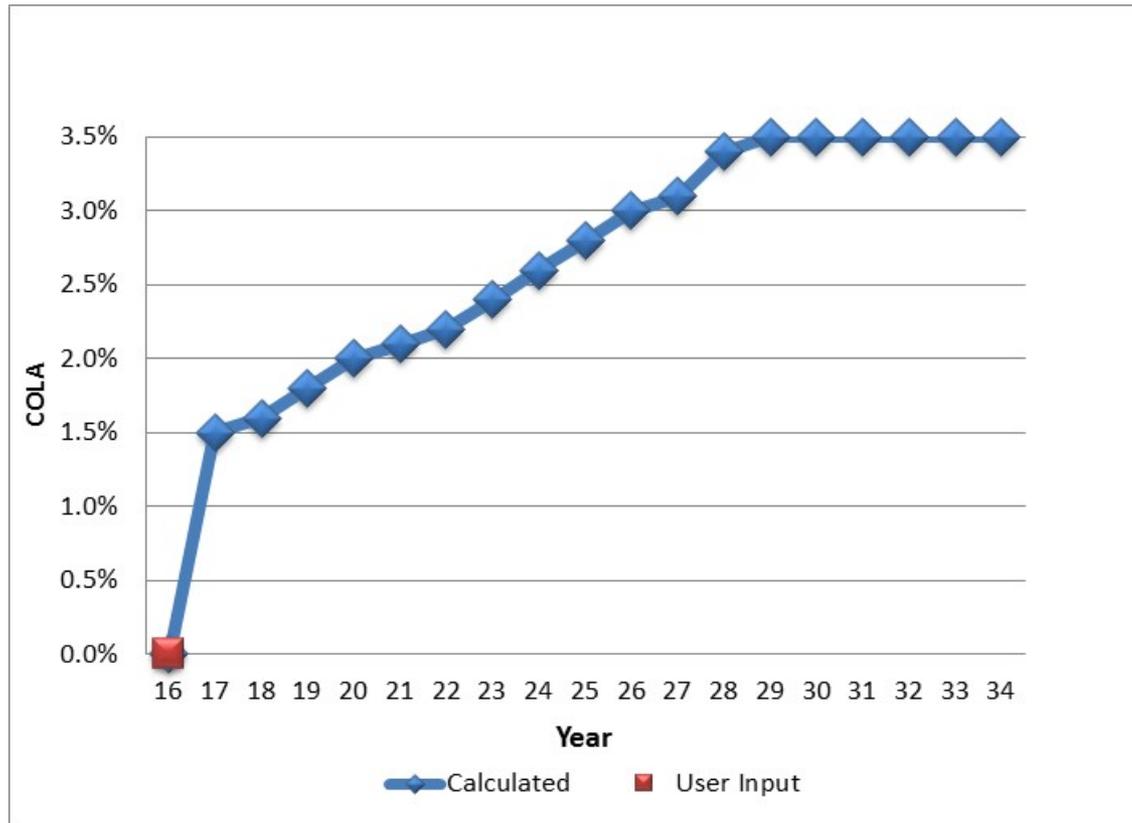
Data Underlying Projections

- All projections throughout our analysis are based on assumptions, data, plan provisions, and methods used in the July 1, 2015 actuarial valuation except the starting asset value
- The starting asset value is based on the actual average assets for April 2016 of \$56.1M

*See appendix for additional details on methodologies and assumptions

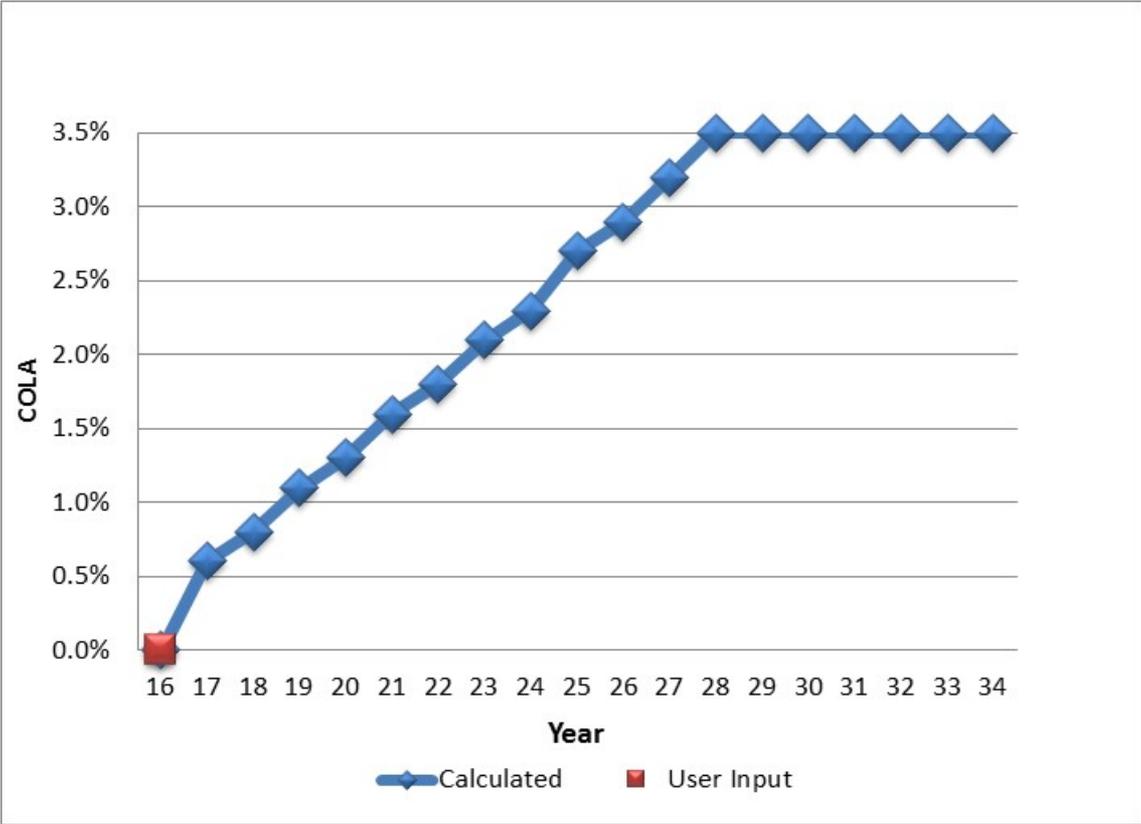
Assume Liability Settlement at 5% (Current Assumption)

Settlement with Purchasable COLA up to a Maximum of 3.5%



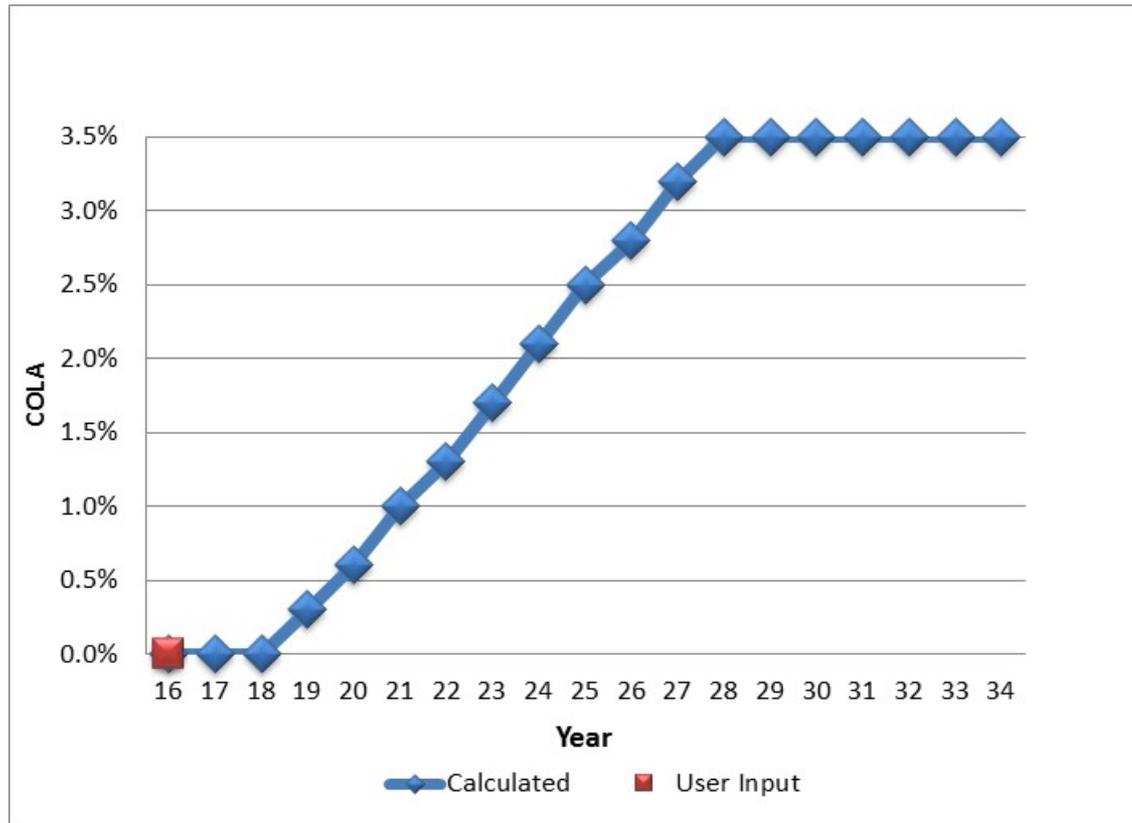
Assume Liability Settlement at 4% (Alternative 1)

Settlement with Purchasable COLA up to a Maximum of 3.5%



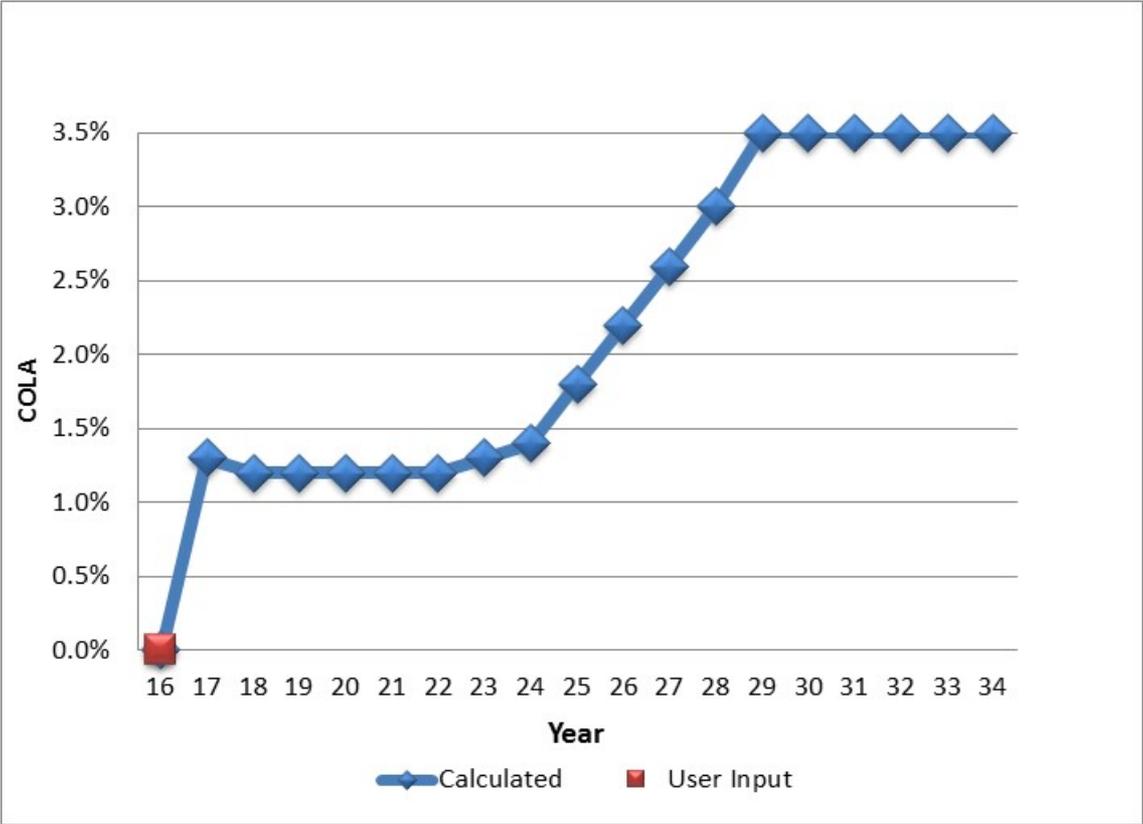
Assume Liability Settlement at 3% (Alternative 2)

Settlement with Purchasable COLA up to a Maximum of 3.5%



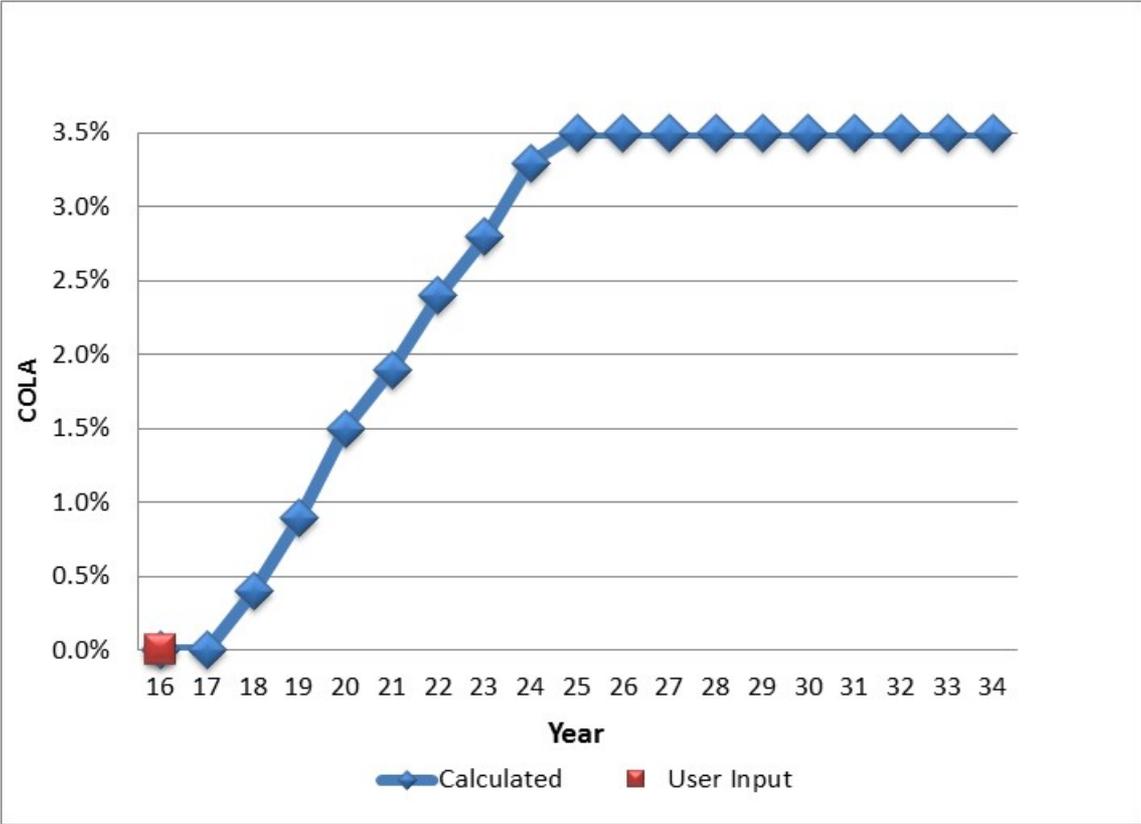
**Assume Liability Settlement at 5% grading down 25bp per year until 3% in 2024
(Alternative 3)**

Settlement with Purchasable COLA up to a Maximum of 3.5%



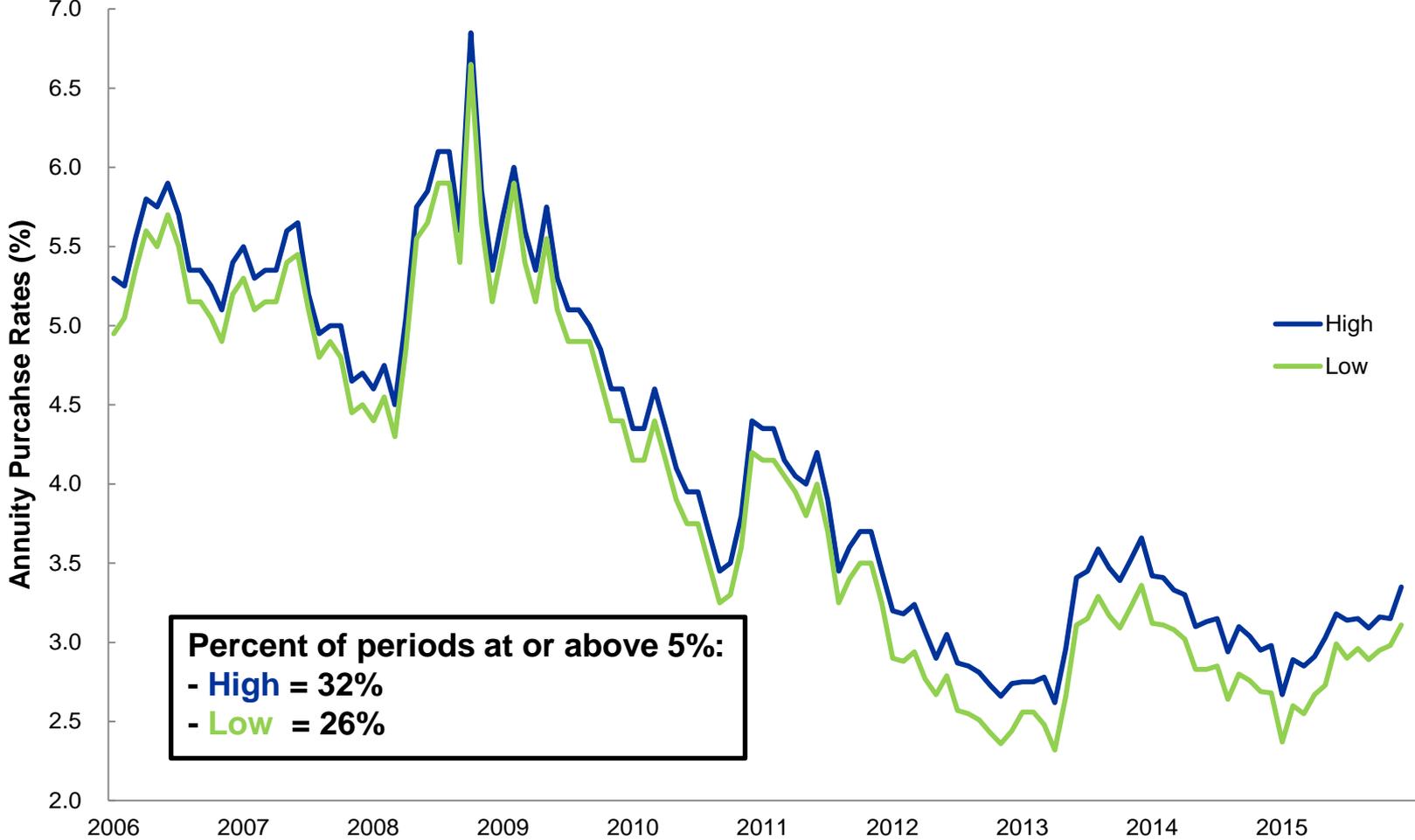
**Assume Liability Settlement at 3% grading up 25bp per year until 5% in 2024
(Alternative 4)**

Settlement with Purchasable COLA up to a Maximum of 3.5%



Annuity Purchase

10-year History of Biweekly Ranges of Annuity Purchase Rates*



*Source for pre-2012 data (Brentwood) and post 2012 data (Aon)

Annuity Purchase Price Estimate

The annuity purchase price estimate is the present value of the plan's benefit payment stream determined using data, assumptions, methods and plan provisions disclosed in the July 1, 2015 actuarial valuation report except for the following two assumptions:

1. Discount rate is the annuity purchase rate shown below
2. COLA of 0% in 2016 and as shown below for years 2017 onwards

Average Rate	High/Low	Annuity Purchase Rate	COLA: 0%	COLA: 1.0%	COLA: 1.5%	COLA: 2.0%	COLA: 2.5%	COLA: 3.0%	COLA: 3.5%
3 Year	High	3.13%	\$60.8	\$66.7	\$70.0	\$73.6	\$77.5	\$81.8	\$86.4
	Low	2.86%	\$62.4	\$68.6	\$72.1	\$75.9	\$80.0	\$84.5	\$89.4
5 Year	High	3.25%	\$60.0	\$65.8	\$69.1	\$72.6	\$76.4	\$80.6	\$85.1
	Low	2.99%	\$61.6	\$67.7	\$71.1	\$74.8	\$78.8	\$83.2	\$88.0
10 Year	High	4.17%	\$55.0	\$59.9	\$62.7	\$65.7	\$68.9	\$72.4	\$76.2
	Low	3.95%	\$56.1	\$61.2	\$64.1	\$67.2	\$70.6	\$74.2	\$78.2

Average assets for April 2016 were \$56.1 million

Appendix

Stochastic Analysis and COLA Projection – Assumptions

Data Underlying Projections

- All projections throughout our analysis are based on assumptions, data, plan provisions, and methods used in the July 1, 2015 actuarial valuation except the starting asset value
- The starting asset value is based on the actual average assets for April 2016 of \$56.1 million

Purchasable COLA Projections

- Our analysis are based on plan assets and liabilities projected as of April 15 of each year
- Assets are projected assuming expected returns

Investment Policy

Asset Class	Current: 40% Fixed Income
U.S. Core Fixed Income	36.0%
High Yield Bonds	4.0%
U.S. Equity	37.5%
International Equity	10.0%
Emerging Markets Equity	2.5%
Real Assets & Property	10.0%
Total Asset Mix (FI / EQ / Real Estate)	40 / 50 / 10
Expected Annual Return	6.23%
Expected Risk (Std. Dev.)	9.58%

Expected annual returns and risk along with current asset allocation was provided by the plan's investment advisor – Principal. Asset allocation for alternative portfolios assumed to maintain a consistent split among asset classes for fixed income and equities.

Assumptions – Capital Market Expectations

Asset Class	Geometric Return	Arithmetic Return	Expected Risk
U.S. Core Fixed Income	3.50%	3.60%	5.00%
High Yield Bonds	6.35%	6.80%	10.00%
U.S. Equity	6.50%	7.80%	17.00%
International Equity	6.70%	8.25%	18.65%
Emerging Markets Equity	6.50%	9.45%	26.00%
Real Assets & Property	6.40%	6.75%	8.40%

Methodology for Stochastic Forecasting

- Principal provided the following information for each asset class in February 2016:
 - Mean geometric returns, mean arithmetic returns and standard deviations
 - Correlation coefficients
- Analyzed 20 projection years (2016 – 2035)
- Ran 5,000 simulations of projections per asset portfolio per projection year based on the calculated arithmetic expected return and standard deviation for each asset portfolio assuming a normal distribution
- The expected long-term rate of return for any simulation regresses to the mean
- Determined 5th through 95th percentiles of Market Value of Assets, Actuarial Accrued Liability, and Funded Ratio for 2016 – 2035 based on the results of 5,000 simulations per year

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