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South Dakota Department of Labor Retirement Plan

Retirement Plan Discussion

Deloitte Consulting LLP

May 31, 2017

July 1, 2016
Retirement Plan Valuation Results

July 1, 2016 Retirement Plan Valuation Results

	Actuarial Liability	Market Value of Assets	Unfunded Actuarial Liability	Change in Unfunded Actuarial Liability
Amounts disclosed as of July 1, 2015	$59.9	$60.7	($0.8)	
Expected amounts as of July 1, 2016	$59.3	$60.1	($0.8)	$0.0
Change due to investment return	$59.3	$56.0	$3.3	$4.1
Change due to 0% 2016 COLA	$58.7	$56.0	$2.7	($0.6)
Change due to mortality assumption	$57.6	$56.0	$1.6	($1.1)
Change due to discount rate assumption	$67.1	$56.0	$11.1	$9.5
Change due to COLA assumptions	$55.2	$56.0	($0.8)	($11.9)

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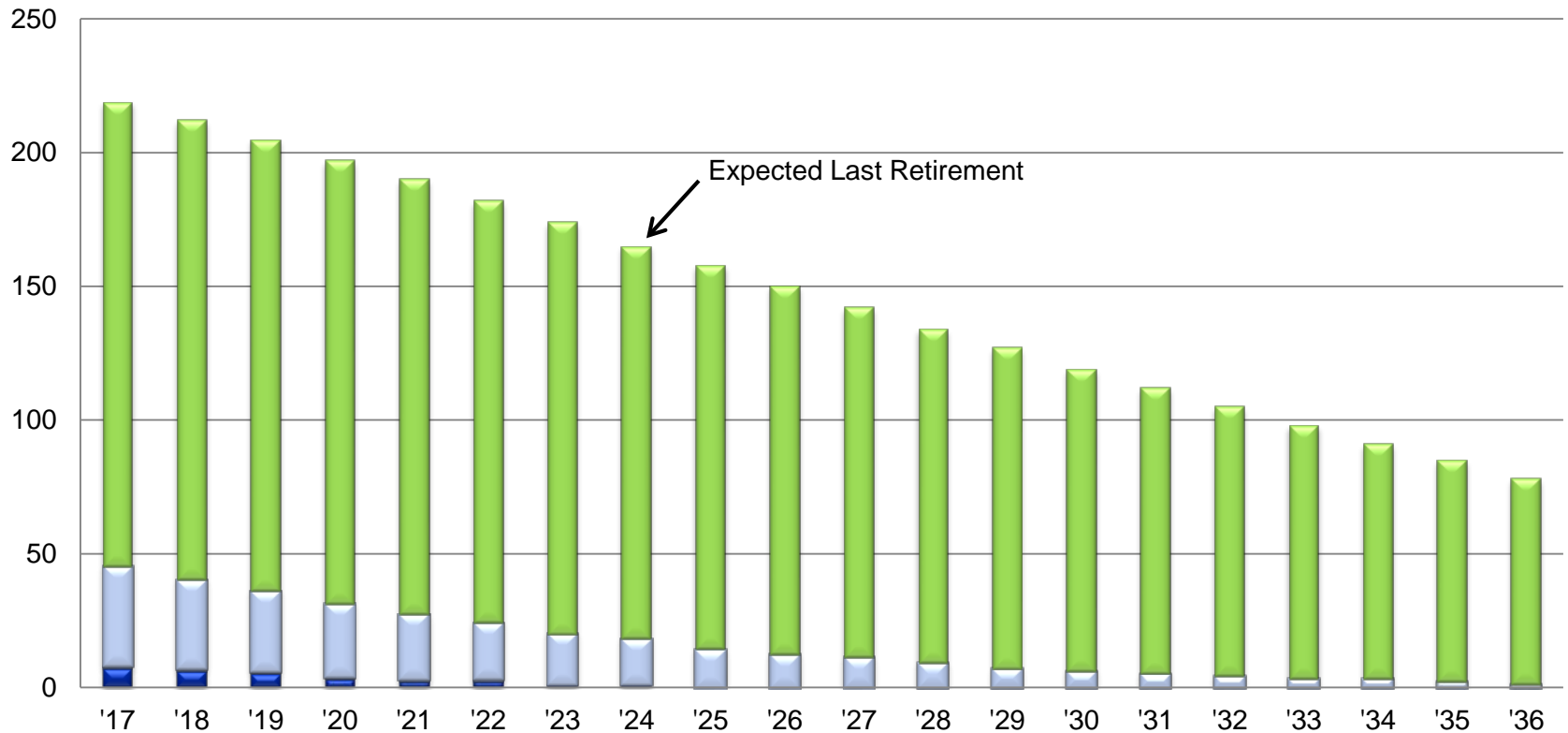# July 1, 2016 Retirement Plan Valuation Results

Plan Participation – History
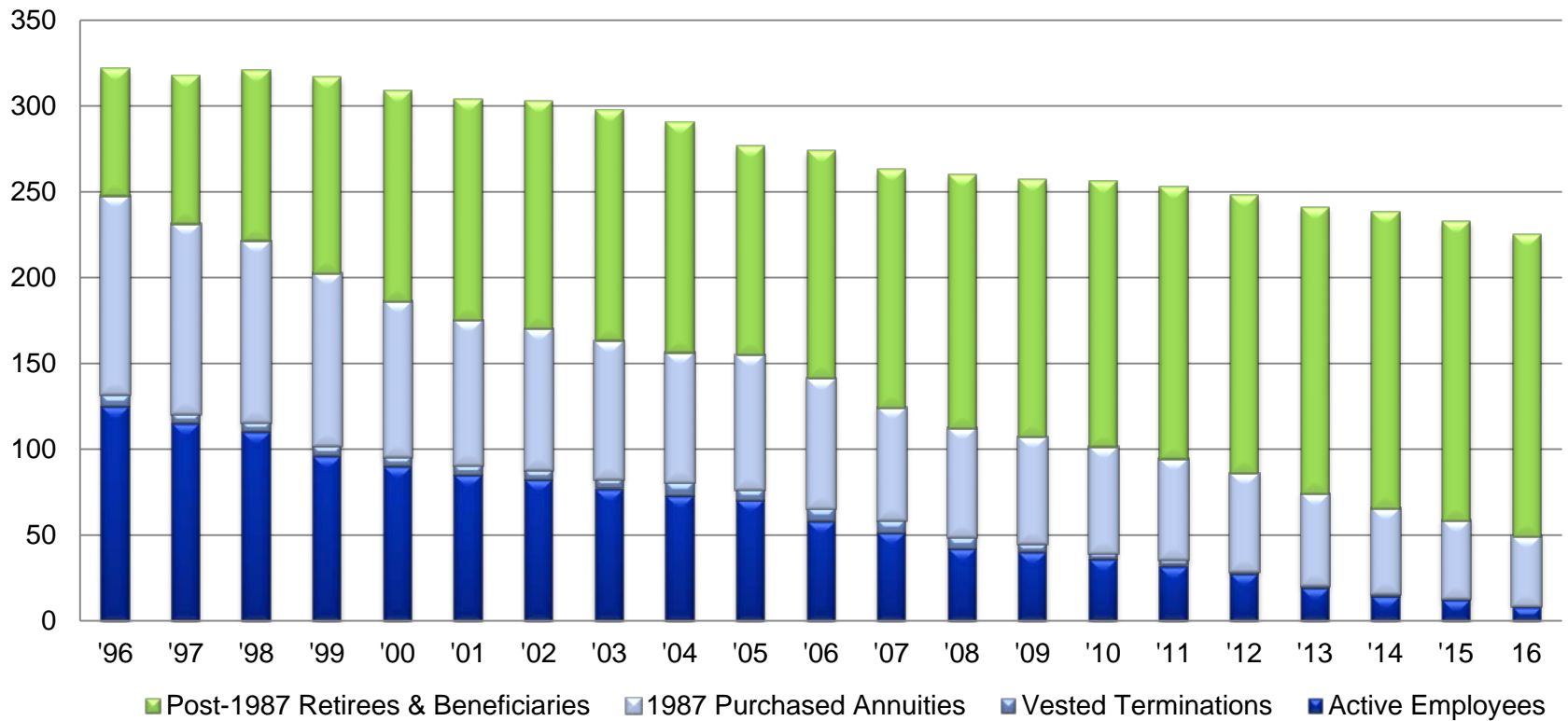
Demographic Information as of 7/1/2016	Post 1987 Retirees & Beneficiaries	1987 Purchased Annuities	Vested Terminations	Active Employees
Counts	176	40	1	8
Average Age	72.2	86.5	56.4	63.5

Plan Participation – Projection

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Assets and Liabilities as of July 1
(Results are in thousands)

Legend: Actuarial Accrued Liability — Market Value of Assets — Funded ratio
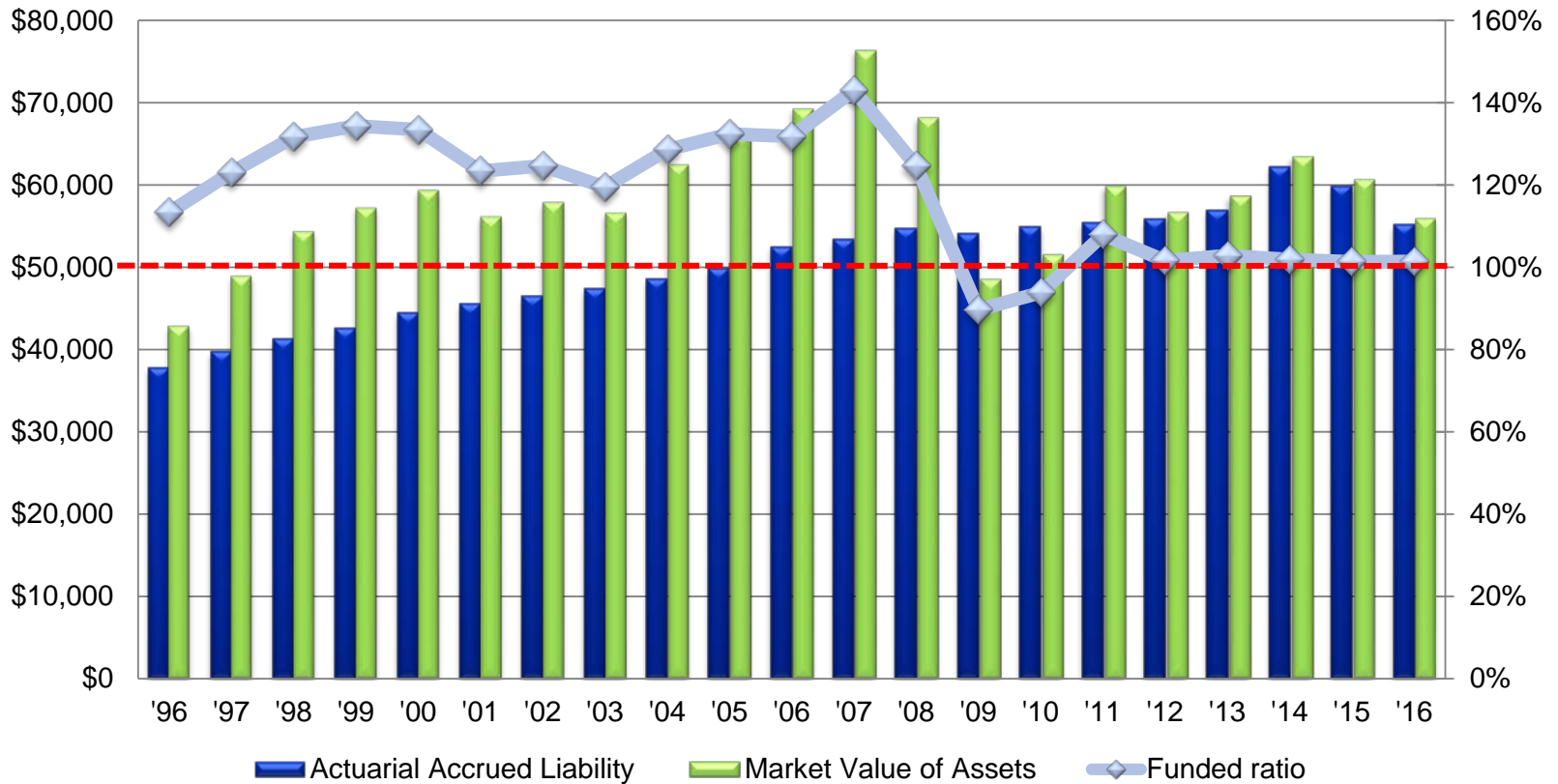
7% of the 2016 Actuarial Accrued Liability was attributable to active employees.

Determination of Cost of Living Adjustment for July 1, 2017

The average asset value during April 2016 was **$56,761,795** which provides for a 1.0% COLA to be paid on July 1, 2017 if approved by the Board

<u>Present Value of Future Benefits for Related Cost of Living Adjustments as of April 15, 2017</u>

COLA	PVFB	COLA	PVFB	COLA	PVFB
0.1%	$51,567,000	1.3%	$58,089,000	2.5%	$65,909,000
0.2%	$52,068,000	1.4%	$58,687,000	2.6%	$66,629,000
0.3%	$52,576,000	1.5%	$59,294,000	2.7%	$67,361,000
0.4%	$53,091,000	1.6%	$59,910,000	2.8%	$68,105,000
0.5%	$53,614,000	1.7%	$60,536,000	2.9%	$68,860,000
0.6%	$54,145,000	1.8%	$61,172,000	3.0%	$69,628,000
0.7%	$54,684,000	1.9%	$61,817,000	3.1%	$70,409,000
0.8%	$55,230,000	2.0%	$62,473,000	3.2%	$71,202,000
0.9%	$55,785,000	2.1%	$63,139,000	3.3%	$72,009,000
1.0%	$56,348,000	2.2%	$63,815,000	3.4%	$72,828,000
1.1%	$56,920,000	2.3%	$64,502,000	3.5%	$73,661,000
1.2%	$57,500,000	2.4%	$65,200,000		

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

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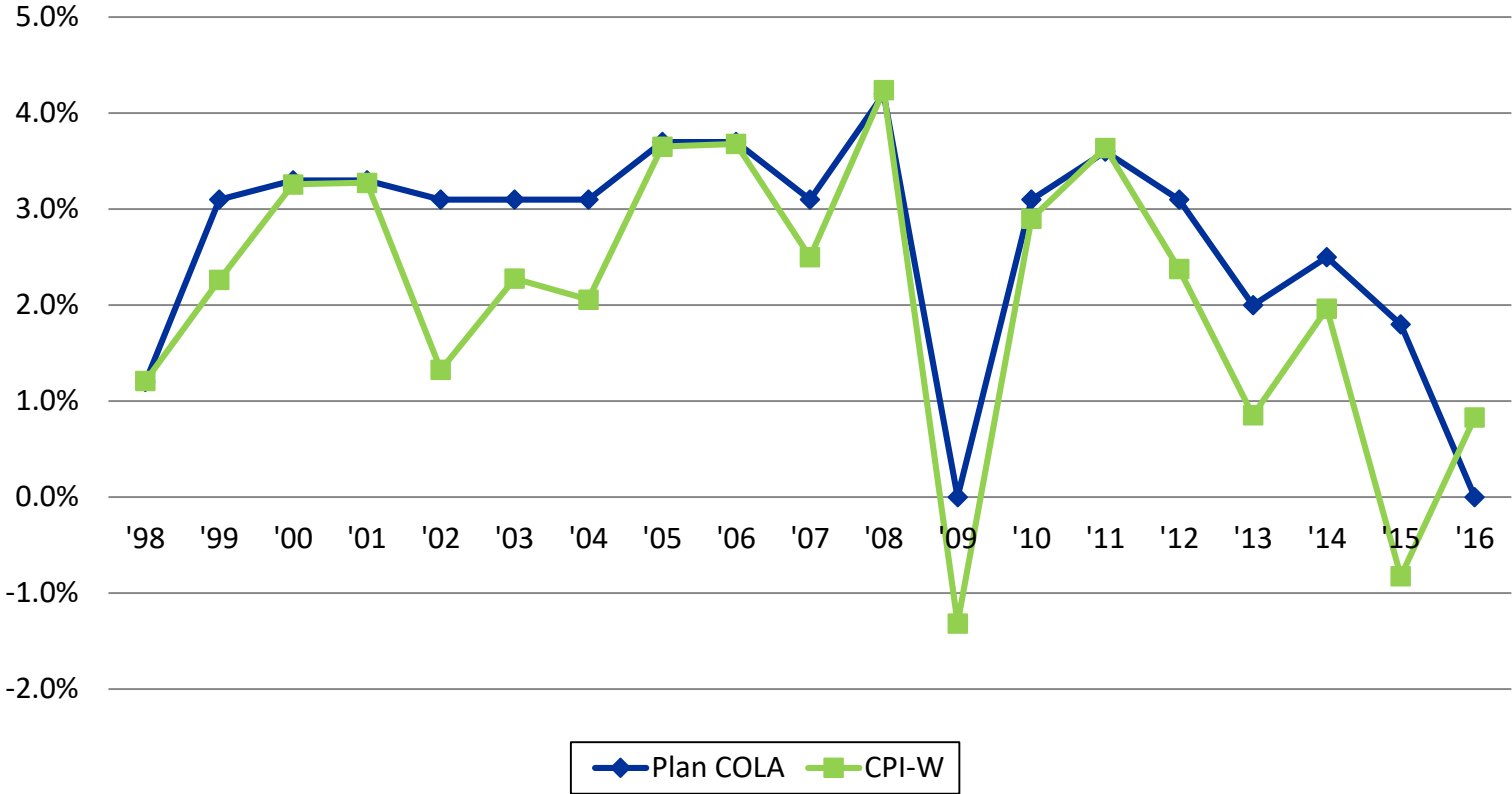
Sample Annual Benefit for pre-1999 Retiree*
Comparing Actual COLA paid to Inflation (CPI-W)

Annual benefits are $2,200 (11.0%) higher under the plan's COLA vs. CPI-W
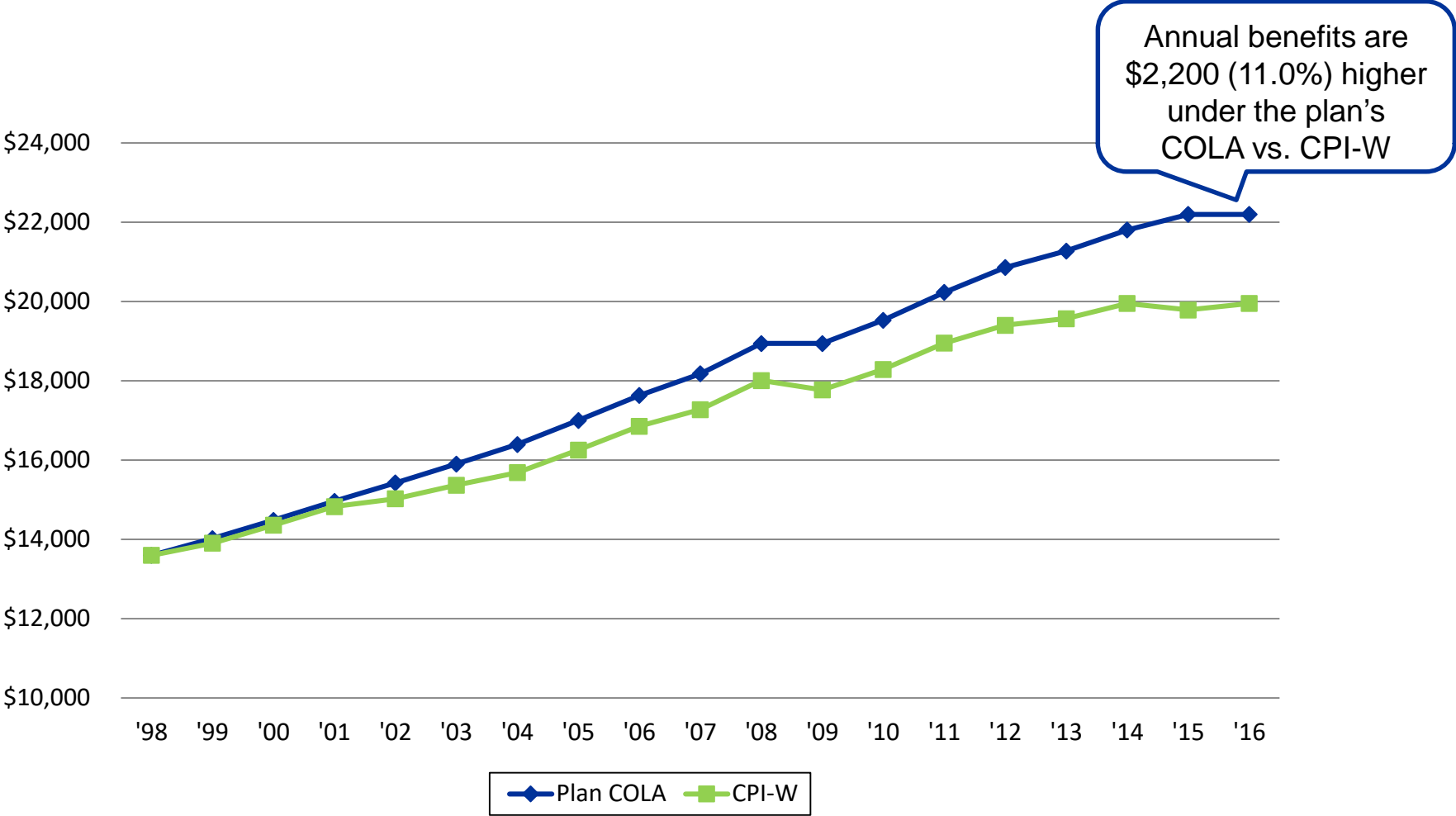
*Sample retiree with $22,200 annual benefit as of July 1, 2016

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Stochastic Analysis of Assets and Projection of Purchasable COLA

# 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, 2016 actuarial valuation except the starting asset value

- The starting asset value is based on the actual average assets for April 2016 of $56.8 million

**"Stochastic" Funded Ratio Projections (see appendix for methodology)**

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

- The expected assets (mean) is shown along with the 75th, 25th, and 5th percentiles

- The 5th percentile means that out of 100 scenarios, the five worst cases are at or below the projected funded ratio shown by the 5th percentile line

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Settlement with Purchasable COLA up to a Maximum of 3.5%*

*Assumes liabilities are settled at 4.0%

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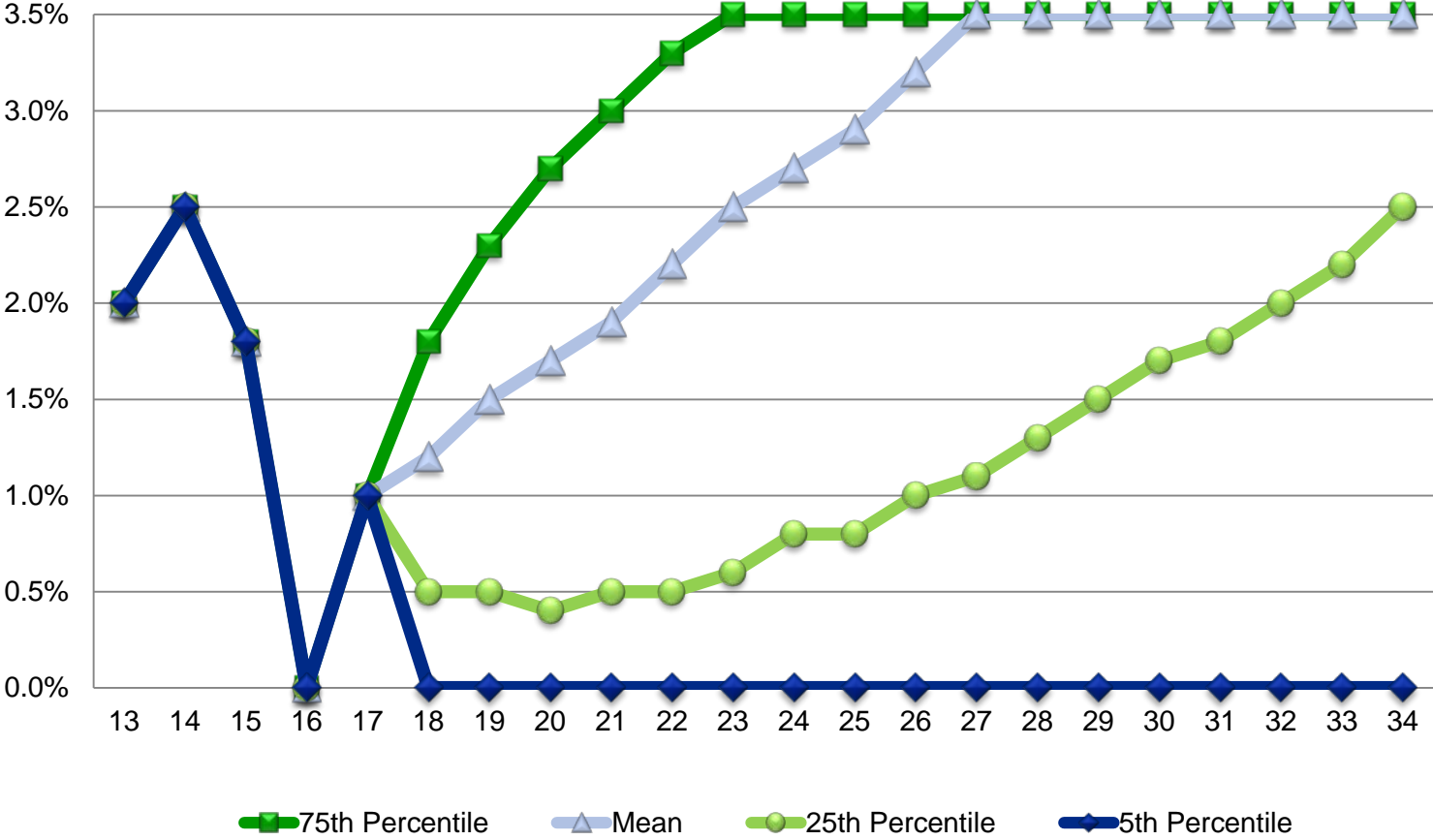
Funded Ratio after Settlement with Purchasable COLA up to a Maximum of 3.5%*

Legend: 75th Percentile | Mean | 25th Percentile | 5th Percentile

*Assumes liabilities are settled at 4.0%

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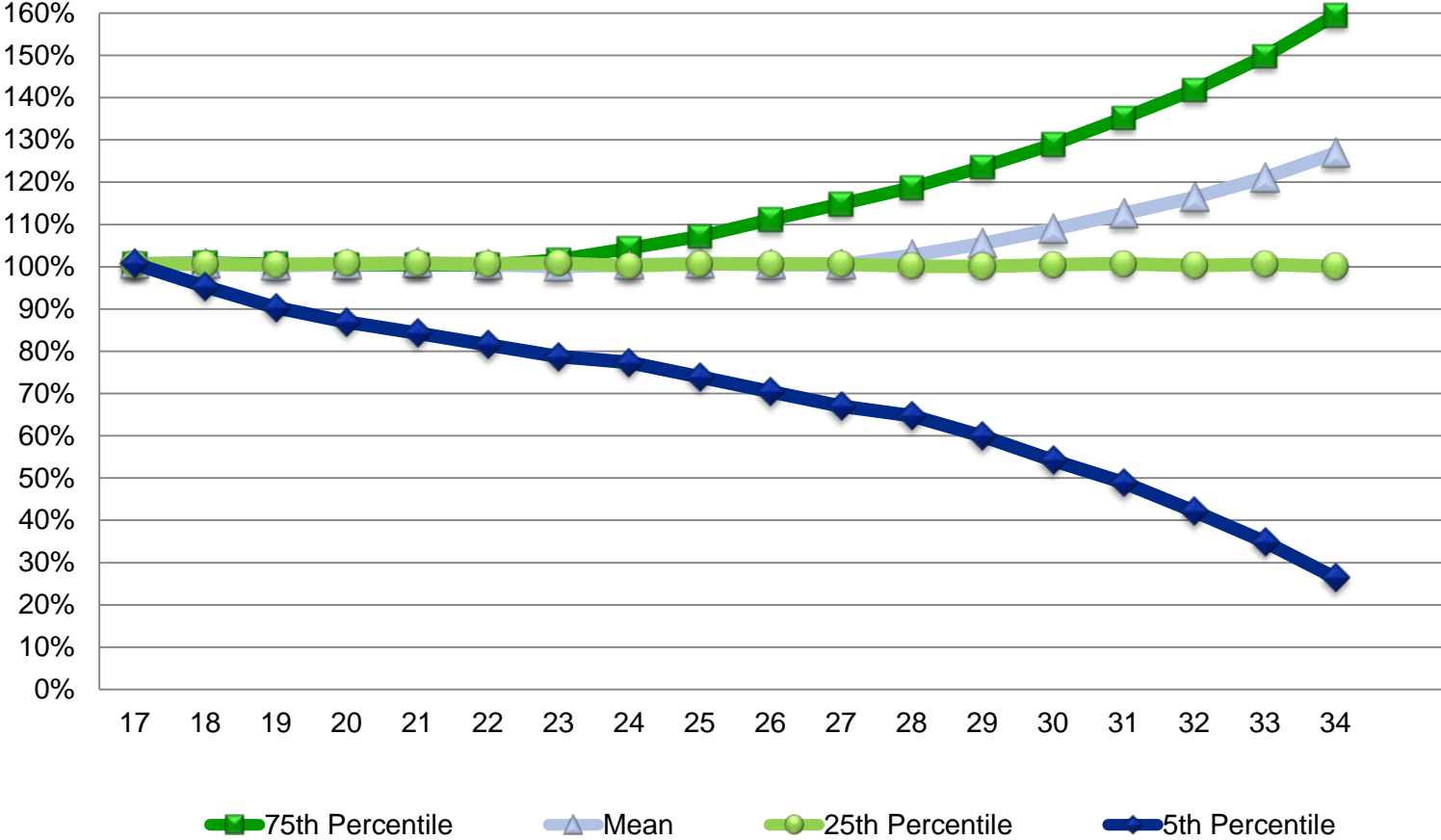
Settlement – Surplus/(Shortfall) in $Millions after COLA Purchase*

Year	75th	Mean	25th	5th	Year	75th	Mean	25th	5th
2017	-	-	-	-	2027	$7.3	$0.2	-	($9.3)
2018	-	-	-	($2.3)	2028	$8.7	$1.2	-	($9.2)
2019	-	-	-	($4.5)	2029	$10.4	$2.2	-	($9.6)
2020	-	-	-	($5.8)	2030	$12.1	$3.4	-	($10.2)
2021	-	-	-	($6.6)	2031	$13.8	$4.6	-	($10.4)
2022	-	-	-	($7.3)	2032	$15.4	$5.6	-	($10.7)
2023	$1.0	-	-	($7.9)	2033	$17.2	$6.8	-	($11.0)
2024	$2.4	-	-	($7.9)	2034	$19.1	$8.0	-	($11.2)
2025	$3.9	-	-	($8.5)					
2026	$5.7	-	-	($9.0)					

*Assumes liabilities are settled at 4.0%

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

Percent of periods at or above 5%:
- **High** = 27%
- **Low** = 11%
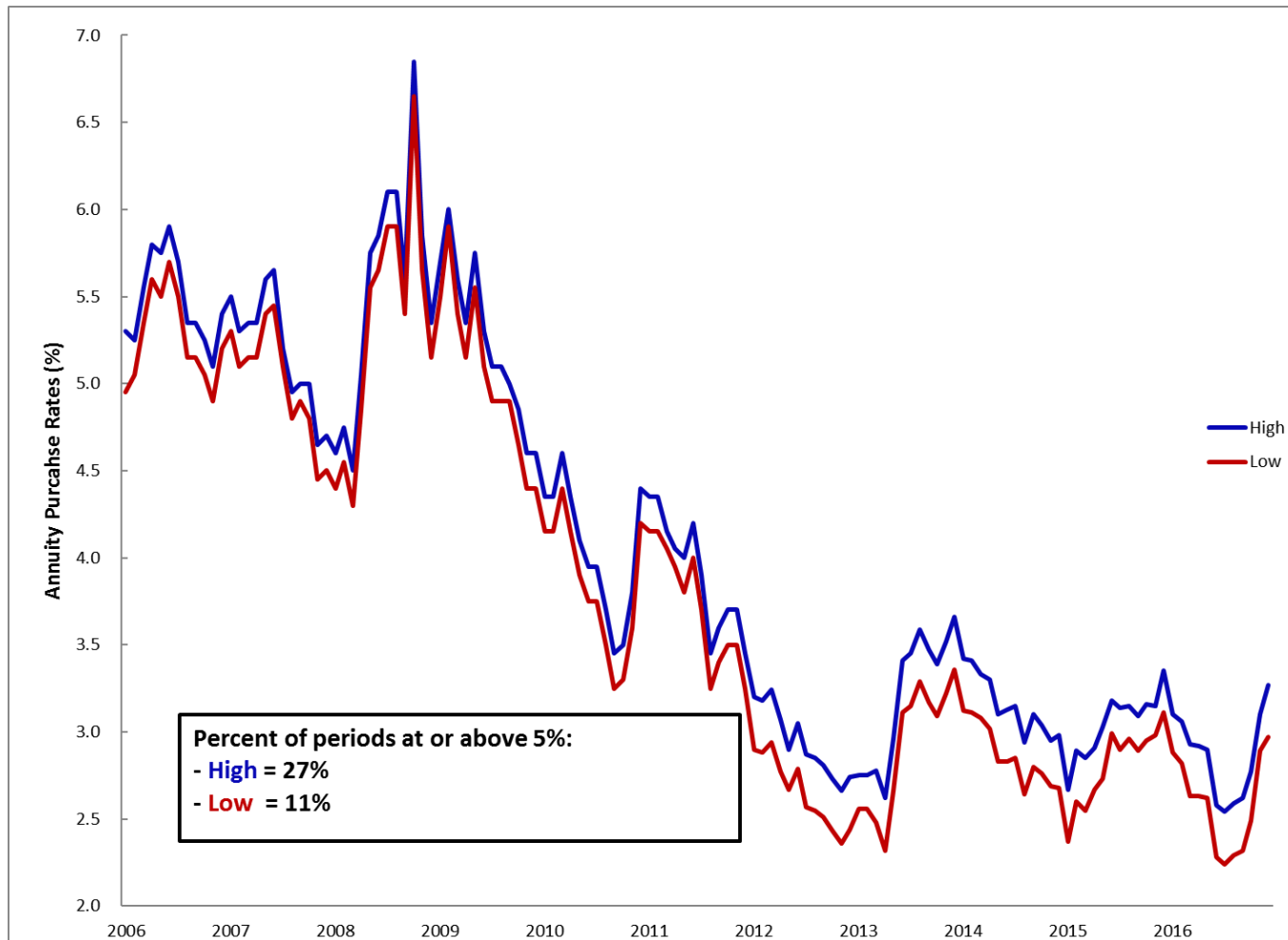
*Source for pre-2012 data (Brentwood) and post 2012 data (Aon)

Based on information as of end of February 2017, the estimated price of settling the plan is approximately $55 million, at an estimated annuity settlement rate of 3.6%.

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Appendix

Investment Policy

Asset Class	Current: 40% Fixed Income
U.S. Core Fixed Income	36.0%
High Yield Bonds	4.0%
U.S. Equity	39.0%
International Equity	13.0%
Real Assets	2.0%
Private Property	6.0%
Total Asset Mix (FI / EQ / Real Estate)	**40 / 54 / 6**
Expected Annual Geometric Return	**5.39%**
Expected Risk (Std. Dev.)	**12.2%**

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.

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Assumptions – Capital Market Expectations

Asset Class	Geometric Return	Arithmetic Return	Expected Risk
U.S. Core Fixed Income	3.65%	3.78%	5.15%
High Yield Bonds	5.35%	5.85%	10.00%
U.S. Equity	6.50%	7.95%	17.00%
International Equity	6.50%	8.12%	17.15%
Real Assets	6.30%	6.65%	8.40%
Private Property	6.00%	6.98%	14.00%

*Arithmetic return was derived from the geometric returns and expected risk provided by SD DOL's investment advisor (Principal) for all asset classes using the following formula: Arithmetic Return = [Geometric Return + (.5*SD^2)]*

Methodology for Stochastic Forecasting

- Principal provided the following information for each asset class as of December 2016:
  - Mean geometric returns and standard deviations
  - Correlation coefficients

- Analyzed 20 projection years (2017 – 2036)

- 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 2017 – 2036 based on the results of 5,000 simulations per year

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