North Carolina State Health Plan

Actuarial Valuation and Review of Other Postemployment Benefits (OPEB) as of December 31, 2016 In accordance with GASB Statement No. 45

Segal Consulting

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October 11, 2017

Committee on Actuarial Valuation
Of Retired Employees' Health Benefits (OPEB)
State of North Carolina
4901 Glenwood Avenue, Suite 300
Raleigh, North Carolina 27612

Dear Committee members:

We are pleased to submit this Actuarial Valuation and Review of Other Postemployment Benefits (OPEB) as of December 31, 2016 under Governmental Accounting Standards Board Statement 45. The report summarizes the actuarial data used in the valuation, discloses the Net OPEB obligation (NOO) as of December 31, 2016, establishes the Annual Required Contribution (ARC) for the coming year, and analyzes the preceding year's experience. This report was based on the census data provided by the Teachers' and State Employees' Retirement System (TSERS), the financial information prepared by the Department of State Treasurer, and the terms of the Plan. The actuarial calculations were completed under the supervision of Daniel J. Rhodes, FSA, MAAA, Vice President and Consulting Actuary, and Peter Wang, Ph.D, ASA, MAAA, EA, Associate Actuary.

This actuarial valuation has been completed in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions used in this valuation and described in Exhibit II are reasonably related to the experience of and the expectations for the Plan. The actuarial projections are based on these assumptions and the plan of benefits as summarized in Exhibit III.

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: ______________________
Daniel J. Rhodes, FSA, MAAA
Vice President and Consulting Actuary

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David A. Berger, FCA, ASA, MAAA, EA
Vice President and Associate Actuary

SECTION 1

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IMPORTANT INFORMATION ABOUT ACTUARIAL VALUATIONS

An actuarial valuation is a budgeting tool with respect to the defining future uncertain obligations of a postretirement health plan. As such, it will never forecast the precise future stream of benefit payments. It is an estimated forecast – the actual cost of the plan will be determined by the benefits and expenses paid, not by the actuarial valuation.

In order to prepare a valuation, Segal Consulting ("Segal") relies on a number of input items. These include:

- **Plan of benefits** Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. For example, a plan may require the award of a Social Security disability pension as a condition for receiving a disability pension from the plan and subsequent health benefits. If so, changes in the Social Security law or administration may change the plan's costs without any change in the terms of the plan itself. It is important for the State to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.

- **Participant data** An actuarial valuation for a plan is based on data provided to the actuary by the plan. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. For most plans, it is not possible or desirable to take a snapshot of the actual work force on the valuation date. In any event, the actuarial valuation is based on a future work force that is presumed to be the same as the active population included in the valuation, but in fact, employment varies from year to year, sometimes quite considerably. It is not necessary to have perfect data for an actuarial valuation: the valuation is an estimated forecast, not a prediction. The uncertainties in other factors are such that even perfect data does not produce a "perfect" result. Notwithstanding the above, it is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.

- **Assets** Part of the cost of a plan will be paid from existing assets – the balance will need to come from future contributions and investment income. The valuation is based on the asset values as of the valuation date, typically reported by the auditor. Some plans include assets, such as private equity holdings, real estate, or hedge funds, that are not subject to valuation by reference to transactions in the marketplace. A snapshot as of a single date may not be an appropriate value for determining a single year's contribution requirement, especially in volatile markets. Plan sponsors often use an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.

- **Actuarial assumptions** In preparing an actuarial valuation, Segal starts by developing a forecast of the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year, as well as forecasts of the plan's benefits for each of those events. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved on the plan's assets or, if there are no assets, a rate of return on high quality fixed income investments. All of these factors are uncertain and unknowable. Thus, there will be a range of reasonable assumptions, and the results may vary materially based on which assumptions the actuary selects within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model may use approximations and estimates that will have an immaterial impact on our results and will have no impact on the actual cost of the plan. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

Given the above, the user of Segal's actuarial valuation (or other actuarial calculations) needs to keep the following in mind:

- The actuarial valuation is prepared for use by the State Treasury. It includes information for compliance with accounting standards and for the plan's auditor. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial snapshot is a measurement at a specific date – it is not a prediction of a plan's future financial condition.
- Critical events for a plan include, but are not limited to, decisions about changes in benefits and contributions. The basis for such decisions needs to consider many factors such as the risk of changes in employment levels, variation in claims, and investment losses, not just the current valuation results.
- Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The State should look to their other advisors for expertise in these areas.
- While Segal maintains extensive quality assurance procedures, an actuarial valuation involves complex computer models and numerous inputs. In the event that an inaccuracy is discovered after presentation of Segal's valuation, Segal may revise that valuation or make an appropriate adjustment in the next valuation.
- Segal's report shall be deemed to be final and accepted by the State upon delivery and review. The State should notify Segal immediately of any questions or concerns about the final content.

As Segal Consulting has no discretionary authority with respect to the management or assets of the Plan, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Plan.

PURPOSE

This report presents the results of our actuarial valuation of the State of North Carolina (the "Employer") OPEB plan as of December 31, 2016. The results are in accordance with the Governmental Accounting Standards, which prescribe an accrual methodology for accumulating the value of other postemployment benefits (OPEB) over participants' active working lifetimes.

HIGHLIGHTS OF THE VALUATION

- The **unfunded actuarial accrued liability (UAAL)** as of December 31, 2016 is $31,360,340,091, a decrease of $1,150,685,735, from the prior valuation UAAL of $32,511,025,826. Net unfunded plan obligations had been expected to increase to $34,338,621,517, due to normal plan operations. The difference between actual and expected unfunded actuarial accrued liabilities was the net effect of several factors:

  - An **actuarial experience gain** decreased the UAAL by $2,743 million. This was the net result of gains and losses due to fund investment performance, demographic changes and actual 2016 contributions and benefit payments that were different from expected. We have taken these actuarial gains and losses into account in reviewing our assumptions for the current valuation.

  - **Valuation assumption changes** decreased the UAAL by $236 million. This change consisted of:

    - Changes to health claims costs and changes to the migration pattern to different coverages decreased the UAAL by $2,293 million.

    - This is the first valuation that we have included the Excise Tax stipulated under the PPACA. Reflecting the excise tax in this valuation increased the UAAL by $382 million.

    - Updates to the future trend on such costs decreased the UAAL by $2,196 million.

    - A change to the discount rate increased the UAAL by $3,871 million. The discount rate was reduced from 4.25% to 3.58% based on a decision to apply the discount requirements of GASB Statements 74 and 75 to the final disclosure under GASB Statement 45.

    - A reduction in the assumed payroll inflation rate to 2.75% did not affect the UAAL but increased the ARC by $77 million.

  - Effective January 1, 2018 the CDHP option will be discontinued. This change is reflected in the update to the migration pattern assumption. No other **plan changes** have been reflected in this valuation. The current plan of benefits is summarized in Exhibit III of Section 4.

- As of December 31, 2016, the ratio of assets to the AAL (the funded ratio) is 3.14%.

- The **Net OPEB Obligation (NOO)** increased to $19,241,121,146 for the year ending June 30, 2017. The NOO generally increases if the contributions in relation to the ARC are less than the ARC. The contributions in relation to the ARC during the year ending June 30, 2017 were $950,812,690, compared to the ARC of $2,561,519,735. Contributions in relation to the ARC totaled 35.16% of the ARC in the year ending June 30, 2017. Chart 6 shows the detailed derivation of the NOO as of June 30, 2017.

- **Health Care Reform Assumption:** This valuation does not include the potential impact of any future changes due to the Patient Protection and Affordable Care Act (PPACA) and the Health Care and Education Reconciliation Act (HCERA) of 2010 other than the excise tax on high cost health plans beginning in 2020 (reflected with this valuation) and those previously adopted as of the valuation date. Reflecting the excise tax in this valuation increases the actuarial accrued liability by $382 million and the normal cost by $40 million.

- The **Annual Required Contribution (ARC)** increased to $2,561,519,735 for the year ending June 30, 2017. The ARC was $2,510,817,376 for the year ending June 30, 2016. However, as a percentage of payroll, the ARC increased from 16.00% last year to 16.67% this year.

- The **Annual OPEB Cost (AOC)** increased to $2,651,551,308 for the year ending June 30, 2017. The AOC was $2,598,735,150 last year.

The key valuation results for the current and prior years are shown.

SUMMARY OF VALUATION RESULTS

	December 31, 2016	December 31, 2015
Actuarial Accrued Liability (AAL)	$32,376,514,963	$33,472,003,961
Actuarial Value of Assets	1,016,174,872	960,978,135
Unfunded Actuarial Accrued Liability	$31,360,340,091	$32,511,025,826
Funded Ratio	3.14%	2.87%
Market Value of Assets	$1,016,174,872	$960,978,135
Annual Required Contribution (ARC) for Fiscal Year Ending:	**June 30, 2017**	**June 30, 2016**
Normal cost (beginning of year)	$1,389,672,167	$1,309,854,672
Amortization of the unfunded actuarial accrued liability	1,171,847,568	1,200,962,704
Adjustment for timing	0	0
Total Annual Required Contribution, including adjustment for timing	$2,561,519,735	$2,510,817,376
Covered payroll	$15,363,077,578	$15,691,814,745
ARC as a percentage of pay	16.67%	16.00%
Total Participants	590,813	587,967
Annual OPEB Cost (AOC) for Fiscal Year Ending:	**June 30, 2017**	**June 30, 2016**
Annual Required Contributions	$2,561,519,735	$2,510,817,376
Interest on Net OPEB Obligations	745,466,257	672,053,455
ARC Adjustments	-655,434,684	-584,135,681
Total Annual OPEB Cost	$2,651,551,308	$2,598,735,150
AOC as a percent of pay	17.26%	16.56%

October 11, 2017

ACTUARIAL CERTIFICATION

This is to certify that Segal Consulting, a Member of The Segal Group, Inc. has conducted an actuarial valuation of certain benefit obligations of North Carolina State Health Plan's other postemployment benefit programs as of December 31, 2016, in accordance with generally accepted actuarial principles and practices. The actuarial calculations presented in this report have been made on a basis consistent with our understanding of GASB Statement 45 for the determination of the liability for postemployment benefits other than pensions.

The actuarial valuation is based on the plan of benefits verified by the Employer and reliance on participant, premium, claims and expense data provided by the Employer or from vendors employed by the Employer. Segal Consulting does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. Segal, however, does review the data for reasonableness and consistency.

The actuarial computations made are for purposes of fulfilling plan accounting requirements. Determinations for purposes other than meeting financial accounting requirements may be significantly different from the results reported here. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security at termination of the plan, or determining short-term cash flow requirements.

To the best of our knowledge, this report is complete and accurate and in our opinion presents the information necessary to comply with GASB Statement 45 with respect to the benefit obligations addressed. The signing actuaries are members of the Society of Actuaries, the American Academy of Actuaries, and other professional actuarial organizations and meet their "General Qualification Standards for Statements of Actuarial Opinions" to render the actuarial opinion contained herein.

Daniel J. Rhodes, FSA, MAAA
Vice President and Consulting Actuary

Peter Wang, PhD, ASA, MAAA, EA
Associate Actuary

The actuarial present value of total projected benefits uses the actuarial assumptions disclosed in Section 4 to calculate the value today of all benefits expected to be paid to current actives and retired plan members. The actuarial balance sheet shows the expected breakdown of how these benefits will be financed.

CHART 1

Actuarial Present Value of Total Projected Benefits (APB) and Actuarial Balance Sheet

	Actuarial Present Value of Total Projected Benefits (APB)	
	December 31, 2016	**December 31, 2015**
Participant Category		
Current retirees, beneficiaries, and dependents	$11,917,930,056	$14,481,439,832
Current active members	36,779,419,619	33,507,697,945
Terminated members entitled but not yet eligible	3,755,592,477	3,446,932,314
Total	$52,452,942,152	$51,436,070,091

	December 31, 2016	**December 31, 2015**
Actuarial Balance Sheet		
The actuarial balance sheet as of the valuation date is as follows:		
Assets		
1. Actuarial value of assets	$1,016,174,872	$960,978,135
2. Present value of future normal costs	20,076,427,189	17,964,066,130
3. Unfunded actuarial accrued liability	31,360,340,091	32,511,025,826
4. Present value of current and future assets	$52,452,942,152	$51,436,070,091
Liabilities		
5. Actuarial Present Value of total Projected Benefits	$52,452,942,152	$51,436,070,091

The actuarial accrued liability shows that portion of the APB (Chart 1) allocated to periods prior to the valuation date by the actuarial cost method. The chart below shows the portion covered by retiree contributions, the portion covered by accumulated plan assets, and reconciles the unfunded actuarial liability from last year to this year.

CHART 2

Actuarial Accrued Liability (AAL) and Unfunded AAL (UAAL)

	December 31, 2016	December 31, 2015
Participant Category		
Current retirees, beneficiaries, and dependents	$11,917,930,056	$14,481,439,832
Current active members	16,702,992,430	15,543,631,815
Terminated members entitled but not yet eligible	3,755,592,477	3,446,932,314
Total	$32,376,514,963	$33,472,003,961
Effect of Retiree Contributions		
Actuarial accrued liability before reduction for retiree contributions	$38,342,719,754	$38,412,282,988
Less projected retiree contributions	5,966,204,791	4,940,279,027
Net employer actuarial accrued liability	32,376,514,963	33,472,003,961
Actuarial value of assets	1,016,174,872	960,978,135
Unfunded actuarial accrued liability	$31,360,340,091	$32,511,025,826
Development of Unfunded Actuarial Accrued Liability		
1. Unfunded actuarial accrued liability as of December 31, 2015		$32,511,025,826
2. Employer normal cost at beginning of year		1,309,854,672
3. Expected funding supplied for the year		-900,705,561
4. Interest on (1) and (2)		1,418,446,580
5. Expected unfunded actuarial accrued liability		$34,338,621,517
6. Change due to the combined effect of experience gains, updated assumptions and methods		-2,965,257,358
7. Unfunded actuarial accrued liability as of December 31, 2016		$31,360,340,091

The Annual Required Contribution (ARC) is the amount calculated to determine the annual cost of the OPEB plan for accounting purposes *as if* the plan were being funded through contributions to a trust fund. The GASB standards cannot require the contributions actually be made to a trust fund. The ARC is simply a device used to measure annual plan costs on an accrual basis. The calculation consists of adding the Normal Cost of the plan to an amortization payment. The resulting sum is assumed to be contributed in the middle of the fiscal year.

The amortization payment is based on a 30-year amortization of the Unfunded Actuarial Accrued Liability on an increasing payment basis with a growth rate of 3.50% for fiscal 2016 and 2.75% for fiscal 2017.

CHART 3

Determination of Annual Required Contribution (ARC)

Cost Element	Fiscal Year Beginning July 1, 2016 and Ending June 30, 2017		Fiscal Year Beginning July 1, 2015 and Ending June 30, 2016	
	Amount	**Percentage of Valuation Compensation**	**Amount**	**Percentage of Valuation Compensation**
1. Normal cost	$1,389,672,167	9.05%	$1,309,854,672	8.35%
2. Amortization of the unfunded actuarial accrued liability (30 years)	1,171,847,568	7.62%	1,200,962,704	7.65%
3. Total Annual Required Contribution (ARC)	$2,561,519,735	16.67%	$2,510,817,376	16.00%
4. Total Valuation Compensation	$15,363,077,578		$15,691,814,745	

The Annual OPEB Cost (AOC) adjusts the ARC for timing differences between the ARC and contributions in relation to the ARC. The AOC is the cost of OPEB actually booked as an expense for the Fiscal Year under GASB 45.

CHART 3 (continued)

Determination of Annual OPEB Cost (AOC) – Payable Throughout Fiscal Year

Cost Element	Fiscal Year Beginning July 1, 2016 and Ending June 30, 2017		Fiscal Year Beginning July 1, 2015 and Ending June 30, 2016	
	Amount	**Percentage of Valuation Compensation**	**Amount**	**Percentage of Valuation Compensation**
1. Annual Required Contribution	$2,561,519,735	16.67%	$2,510,817,376	16.00%
2. Interest on Beginning of Year Net OPEB Obligation (NOO)	745,466,257	4.85%	672,053,455	4.28%
3. ARC adjustment	-655,434,684	-4.27%	-584,135,681	-3.72%
4. Annual OPEB Cost	$2,651,551,308	17.26%	$2,598,735,150	16.56%

For GASB 45 (employer reporting) purposes, the schedule of employer contributions compares actual contributions to the AOC.

CHART 4

Required Supplementary Information – Schedule of Employer Contributions GASB 45

Fiscal Year Ended June 30	Annual OPEB Cost	Actual Contributions	Percentage Contributed
2012	$2,535,167,544	$852,358,729	33.62%
2013	2,085,390,268	844,452,283	40.49%
2014	2,295,163,705	798,401,569	34.79%
2015	2,302,617,504	803,893,302	34.91%
2016	2,598,735,150	871,375,087	33.53%
2017	2,651,551,308	950,812,690	35.86%

** Includes an interest adjustment to the end of the year.*

This schedule of funding progress presents multi-year trend information about whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liability for benefits.

CHART 5

Required Supplementary Information – Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) – (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll [(b) – (a) / (c)]
12/31/2007	$296,500,252	$28,890,229,747	$28,593,729,495	1.03%	$14,810,270,168	193.07%
12/31/2008	434,768,521	28,288,439,376	27,853,670,855	1.54%	15,295,559,646	182.10%
12/31/2009	556,303,039	33,321,783,854	32,765,480,815	1.67%	15,131,145,834	216.54%
12/31/2010	655,445,062	33,494,640,678	32,839,195,616	1.96%	15,098,336,130	217.50%
12/31/2011	729,094,584	30,339,346,481	29,610,251,897	2.40%	14,851,954,027	199.37%
12/30/2012	765,827,946	23,883,106,962	23,117,279,016	3.21%	14,957,178,663	154.56%
12/30/2013	890,755,562	26,420,167,735	25,529,412,173	3.37%	15,080,626,734	169.29%
12/31/2014	944,955,001	27,559,480,734	26,614,525,733	3.43%	15,642,889,820	170.14%
12/31/2015	960,978,135	33,472,003,961	32,511,025,826	2.87%	15,691,814,745	207.18%
12/31/2016	1,016,174,872	32,376,514,963	31,360,340,091	3.14%	15,363,077,578	204.13%

The Net OPEB obligation measures the accumulated differences between the annual OPEB cost and the actual contributions in relation to the ARC.

CHART 6

Required Supplementary Information – Net OPEB Obligation (NOO)

Actuarial Valuation Date	Fiscal Year End	Annual Required Contribution (a)	Interest on Existing NOO (b)	ARC Adjustment (c)	Annual OPEB Cost (a) + (b) + (c) (d)	Actual Contribution Amount (e)	Net Increase in NOO (d) – (e) (f)	NOO as of Fiscal Year (g)
12/31/2010	06/30/2011	$2,910,615,707	$331,841,094	-$288,429,771	$2,954,027,031	$868,263,454	$2,085,763,576	$9,893,789,327
12/31/2011	06/30/2012	2,480,159,722	420,486,046	-365,478,224	2,535,167,544	852,358,729	1,682,808,815	11,576,598,142
12/30/2012	06/30/2013	2,021,026,309	492,005,421	-427,641,462	2,085,390,268	844,452,283	1,240,937,985	12,817,536,127
12/30/2013	06/30/2014	2,223,900,337	544,745,285	-473,481,917	2,295,163,705	798,401,569	1,496,762,136	14,314,298,263
12/31/2014	06/30/2015	2,223,032,389	608,357,676	-528,772,561	2,302,617,504	803,893,302	1,498,724,202	15,813,022,465
12/31/2015	06/30/2016	2,510,817,376	672,053,455	-584,135,681	2,598,735,150	871,375,087	1,727,360,063	17,540,382,528
12/31/2016	06/30/2017	2,561,519,735	745,466,257	-655,434,684	2,651,551,308	950,812,690	1,700,738,618	19,241,121,146

This exhibit summarizes the participant data used for the current and prior valuations.

EXHIBIT A

Summary of Participant Data

	December 31, 2016	December 30, 2015
Retirees		
Number of retirees	200,341	195,670
Average age of retirees	69.9	69.9
Number of spouses	10,969	8,654
Average age of spouses	66.1	66.6
Surviving Spouses		
Number	2,115	3,560*
Average age	80.6	74.0
Inactive Vesteds		
Number of inactive vested	39,230	37,118
Average age of inactive vested	47.8	48.1
Average expected retirement age	63.0	63.1
Active Participants		
Number	338,158	342,965
Average age	44.8	45.0
Average years of service	10.2	10.0
Average expected retirement age	60.2	60.0

**Prior year surviving spouse counts includes spouses of current retirees where the retiree and spouse are receiving coverage under split contracts.*

EXHIBIT B

Members in Active Service as of December 31, 2016 By Age and Service

		Service								
Age	Total	0-4	5-9	10-14	15-19	20-24	25 – 29	30 – 34	35 – 39	40 & Over
Under 25	11,927	11,912	13	2	- -	- -	- -	- -	- -	- -
25 - 29	34,202	30,249	3,923	30	- -	- -	- -	- -	- -	- -
30 - 34	36,164	19,159	11,988	4,973	40	4	- -	- -	- -	- -
35 - 39	39,894	15,302	8,778	12,330	3,462	20	2	- -	- -	- -
40 - 44	43,290	12,840	8,183	8,778	10,230	3,230	28	- -	- -	1
45 - 49	52,473	12,574	8,760	10,359	9,022	9,043	2,697	15	2	1
50 - 54	45,068	9,850	7,320	7,917	8,434	6,057	4,857	619	12	2
55 - 59	41,548	7,640	6,383	8,033	8,146	5,829	3,852	1,363	294	8
60 - 64	24,669	4,210	4,216	4,918	4,437	3,546	1,770	988	465	119
65 - 69	6,715	1,233	1,251	1,355	992	680	481	321	260	142
70 & over	2,208	363	362	454	326	200	159	82	111	151
Total	338,158	125,332	61,177	59,149	45,089	28,609	13,846	3,388	1,144	424

EXHIBIT C

Cash Flow Projections

The ARC generally exceeds the current pay-as-you-go ("paygo") cost of an OPEB plan. Over time the paygo cost will tend to grow and may even eventually exceed the ARC in a well funded plan. The following table projects the paygo cost as the projected net fund payment over the next ten years.

Year Ending December 31	Projected Number of Retirees*			Projected Benefit Payments			Projected Retiree Contributions	Projected Net Fund Payment**	Contribution Ratio***
	Current	Future	Total	Current	Future	Total			
2017	213,435	13,827	227,262	$898,208,531	$61,746,896	$959,955,427	$96,374,320	$863,581,107	10.04%
2018	208,574	25,866	234,440	853,557,471	158,194,134	1,011,751,605	125,433,289	886,318,316	12.40%
2019	203,607	38,228	241,835	814,250,695	261,594,517	1,075,845,212	137,798,834	938,046,378	12.81%
2020	198,533	50,662	249,195	779,909,198	368,721,098	1,148,630,296	151,943,729	996,686,567	13.23%
2021	193,345	63,252	256,597	750,104,263	478,594,899	1,228,699,162	168,211,263	1,060,487,899	13.69%
2022	188,035	76,193	264,228	734,200,898	587,638,201	1,321,839,099	187,512,071	1,134,327,028	14.19%
2023	182,600	88,792	271,392	722,612,189	692,817,899	1,415,430,088	208,275,213	1,207,154,875	14.71%
2024	177,042	101,067	278,109	712,709,925	800,945,388	1,513,655,313	228,768,858	1,284,886,455	15.11%
2025	171,356	113,156	284,512	702,238,102	915,021,636	1,617,259,738	249,086,659	1,368,173,079	15.40%
2026	165,523	125,097	290,620	691,206,828	1,035,049,970	1,726,256,798	270,015,791	1,456,241,007	15.64%

* *Includes spouses of retirees.*

** *Total projected benefit payments less projected retiree contributions.*

*** *Ratio of projected retiree contributions to projected benefit payments.*

EXHIBIT D

Financial Information

Employers may accumulate assets to pay for future OPEB. In order to be treated as plan assets, the funds must be set aside in a trust fund or equivalent arrangement that has the following characteristics:

a. Employer contributions are irrevocable
b. Plan assets are dedicated to OPEB only
c. Plan assets are legally protected from the creditors of the employer and the plan administrator.

North Carolina State Health Plan has an arrangement that meets those requirements.

Statement of Plan Net Assets

	Year Ended December 31, 2016	Year Ended December 31, 2015
Assets		
Cash equivalents	$164,896,681	$167,071,868
Investments	880,990,930	824,711,636
Investment income accrued	123,107	93,229
Contributions receivable	58,520,728	52,293,265
Total assets	$1,104,531,446	$1,044,169,998
Liabilities		
Less accounts payable:	-88,356,574	-83,191,863
Net assets held in trust for other postemployment benefits	$1,016,174,872	$960,978,135

EXHIBIT E

Statement of Changes in Plan Net Assets

	Year Ended December 31, 2016	Year Ended December 31, 2015
Additions		
Employer contributions	$900,705,561	$864,402,910
Interest credited	53,647,359	3,389,998
Total additions:	$954,352,920	$867,792,908
Deductions		
Benefit Payments	-$898,636,741	-$851,391,168
Expenses	-519,442	-378,606
Total deductions	-$899,156,183	-$851,769,774
Net increase	$55,196,737	$16,023,134
Net assets held in trust for other postemployment benefits		
Beginning of year	$960,978,135	$944,955,001
End of year	$1,016,174,872	$960,978,135

** Employer contributions include both implicit and explicit subsidies for the retirees' cost of OPEB. These are the contributions in relation to the ARC.*

EXHIBIT F

Detailed Actuarial Gain and Loss Analysis

If all actuarial assumptions had been exactly realized the ARC would have been expected to be $2,620,899,342 this year. The actual ARC for this year is $2,561,519,735, a difference of $59,379,607. The following chart identified the sources of this difference.

Actuarial Gain and Loss

	FY2017	FY2016
Expected ARC	$2,620,899,342	$2,273,292,656
Experience gain or loss	-163,204,804	26,253,157
Demographic assumption changes	0	29,709,861
Health cost assumption changes	-278,806,981	210,117,608
Discount rate and inflation assumption change	382,632,178	0
Plan changes	0	-28,555,906
Total changes	-59,379,607	237,524,720
Actual ARC	$2,561,519,735	$2,510,817,376

EXHIBIT I

Summary of Required Supplementary Information

Valuation date	December 31, 2016	
Actuarial cost method	Projected Unit Credit. Service from hire date to full eligibility was used to allocate costs. Full eligibility in this context refers to the date when an employee retires, according to the valuation assumptions.	
Amortization method	30-Year Amortization Open	
Remaining amortization period	30 years as of December 31, 2016	
Asset valuation method	Market Value	
Actuarial assumptions:		
Investment rate of return	3.58%	
Inflation rate	2.75%	
Projected salary increases	Vary by group and years of service	
Medical cost trend rate (excluding Medicare Advantage plans)	6.50% grading to 5.00% by 2023	
Drug cost trend rate	7.25% grading to 5.00% by 2026	
Medicare Advantage trend rate	4.00% for four years, 5.00% at 2021 and later	
Plan membership:	December 31, 2016	December 31, 2015
Current retirees, beneficiaries, and dependents	213,425	207,884
Current active participants	338,158	342,965
Terminated participants entitled but not yet eligible	39,230	37,118
Total	590,813	587,967

EXHIBIT II

Actuarial Assumptions and Actuarial Cost Method

Data:	Detailed census data, premium data and/or claim experience, and summary plan descriptions for OPEB were provided by the State.
Actuarial Cost Method:	Projected Unit Credit. Service from hire date to full eligibility was used to allocate costs. Full eligibility in this context refers to the date when an employee retires, according to the valuation assumptions.
Asset Valuation Method:	Market Value
Basis for Demographic Assumptions:	The demographic assumptions are based on a study performed by Conduent HR Services (formerly known as Buck Consultants) for the period ending December 31, 2014. The study was presented to the Board of Trustees for the Teachers' and State Employees' Retirement System of North Carolina in October 2015 and was approved for use. The mortality tables approved are based on standard tables created for corporate pension plans. The post-retirement mortality tables are adjusted by separate factors for ages before and after age 78. This creates a mortality table that is not smooth (continuous) at age 78. Typically a single adjustment is made to a table, rather than having multiple adjustments. Segal does not have a clear understanding of why there are multiple factors – it could be linked to the geographic area, or typical of governmental employees, or any other number of factors. The Society of Actuaries sent out a request for proposal in 2016 to study public pension plan mortality because government employees do not exhibit the same mortality as corporate employees. As of the date of the valuation we find it difficult to assess whether having this segmented approach is warranted.
Measurement Date:	December 31, 2016
Discount Rate:	3.58%- The discount rate is based on the Bond Buyer 20-year GO index as of June 30, 2017. This rate is consistent with the rate that will be used for June 30, 2017 measurements of the Net OPEB Obligation under GASB Statements 74 and 75. The State's financial staff provided input into the selection of this rate.

Pre-Retirement Mortality: Teachers and other education employees use RP-2014 White Collar Employee. All other employees use the RP-2014 Employee table without adjustment.

Post-Disablement Mortality: RP-2014 Mortality tables for disabled annuitants multiplied by 103% for males and by 99% for females.

Post-Retirement Mortality:

Retirees	Adjustments to the RP-2014 Healthy Annuitant Base Table: Prior to 78	Adjustments to the RP-2014 Healthy Annuitant Base Table: After 78
Male Teachers	92% of White Collar Male	120% of White Collar Male
Female Teachers	78% of White Collar Female	108% of White Collar Female
Male General	108% of Male	124% of Male
Female General	81% of Female	113% of Female
Male Law Enforcement	100% of Male	100% of Male
Female Law Enforcement	100% of Female	100% of Female

Spouses 123% of the Male and Female Retiree Tables

Mortality Projection Scale: MP-2015

Disability rates:

	Rate				
	General Employees		Teachers		Law Enforcement
Age	Male	Female	Male	Female	Unisex
25	0.0002	0.0002	0.0001	0.0002	0.0033
30	0.0004	0.0004	0.0001	0.0003	0.0043
35	0.0010	0.0010	0.0003	0.0006	0.0060
40	0.0030	0.0030	0.0007	0.0010	0.0079
45	0.0050	0.0050	0.0014	0.0018	0.0110
50	0.0084	0.0084	0.0023	0.0032	0.0176
55	0.0144	0.0144	0.0047	0.0055	0.0307
60	0.0240	0.0240	0.0077	0.0102	0.0601
65	0.0000	0.0000	0.0000	0.0000	0.0000
69	0.0000	0.0000	0.0000	0.0000	0.0000

Turnover rates:

Teachers - Male

Age	Service 0	1	2	3	4	>=5
<=24	0.190	0.160	0.140	0.120	0.095	0.080
25 to 29	0.190	0.160	0.140	0.120	0.095	0.080
30 to 34	0.190	0.160	0.140	0.120	0.095	0.070
35 to 39	0.190	0.160	0.140	0.120	0.095	0.045
40 to 44	0.190	0.160	0.140	0.120	0.095	0.035
45 to 49	0.190	0.160	0.140	0.120	0.095	0.0325
>=50	0.190	0.160	0.140	0.120	0.095	0.0325

Teachers - Female

Age	Service 0	1	2	3	4	>=5
<=24	0.170	0.145	0.135	0.120	0.100	0.090
25 to 29	0.170	0.145	0.135	0.120	0.100	0.090
30 to 34	0.170	0.145	0.135	0.120	0.100	0.075
35 to 39	0.170	0.145	0.135	0.120	0.100	0.045
40 to 44	0.170	0.145	0.135	0.120	0.100	0.034
45 to 49	0.170	0.145	0.135	0.120	0.100	0.0325
>=50	0.170	0.145	0.135	0.120	0.100	0.0325

General - Male

Age	Service 0	1	2	3	4	>=5
<=24	0.180	0.155	0.130	0.110	0.090	0.080
25 to 29	0.180	0.155	0.130	0.110	0.090	0.080
30 to 34	0.180	0.155	0.130	0.110	0.090	0.070
35 to 39	0.180	0.155	0.130	0.110	0.090	0.0525
40 to 44	0.180	0.155	0.130	0.110	0.090	0.040
45 to 49	0.180	0.155	0.130	0.110	0.090	0.035
>=50	0.180	0.155	0.130	0.110	0.090	0.035

General - Female

Age	Service 0	1	2	3	4	>=5
<=24	0.195	0.170	0.145	0.115	0.100	0.110
25 to 29	0.195	0.170	0.145	0.115	0.100	0.110
30 to 34	0.195	0.170	0.145	0.115	0.100	0.085
35 to 39	0.195	0.170	0.145	0.115	0.100	0.060
40 to 44	0.195	0.170	0.145	0.115	0.100	0.045
45 to 49	0.195	0.170	0.145	0.115	0.100	0.0375
>=50	0.195	0.170	0.145	0.115	0.100	0.0375

Law Enforcement - Male and Female

Age	Service 0	1	2	3	4	>=5
<=24	0.130	0.100	0.090	0.060	0.060	0.040
25 to 29	0.130	0.100	0.090	0.060	0.060	0.040
30 to 34	0.130	0.100	0.090	0.060	0.060	0.035
35 to 39	0.130	0.100	0.090	0.060	0.060	0.030
40 to 44	0.130	0.100	0.090	0.060	0.060	0.030
45 to 49	0.130	0.100	0.090	0.060	0.060	0.040
>=50	0.130	0.100	0.090	0.060	0.060	0.040

Active Retirement Rates:

General - Male

	Service										
Age	<=3	4	5	6 to 19	20 to 23	24	25	26 to 28	29	30	>=31
<=48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.325	0.350	0.200
50	0.000	0.000	0.000	0.000	0.035	0.035	0.080	0.080	0.350	0.350	0.200
51	0.000	0.000	0.000	0.000	0.035	0.035	0.080	0.080	0.350	0.350	0.200
52	0.000	0.000	0.000	0.000	0.035	0.035	0.080	0.080	0.250	0.250	0.200
53	0.000	0.000	0.000	0.000	0.035	0.035	0.080	0.080	0.250	0.300	0.200
54	0.000	0.000	0.000	0.000	0.035	0.035	0.080	0.080	0.300	0.300	0.150
55	0.000	0.000	0.000	0.000	0.050	0.050	0.100	0.100	0.325	0.350	0.200
56	0.000	0.000	0.000	0.000	0.050	0.050	0.100	0.100	0.300	0.275	0.175
57	0.000	0.000	0.000	0.000	0.050	0.050	0.100	0.100	0.225	0.275	0.200
58	0.000	0.000	0.000	0.000	0.050	0.050	0.100	0.100	0.275	0.275	0.200
59	0.000	0.000	0.000	0.000	0.050	0.050	0.100	0.100	0.275	0.275	0.200
60	0.000	0.000	0.085	0.085	0.085	0.225	0.275	0.275	0.350	0.300	0.225
61	0.000	0.000	0.135	0.135	0.135	0.250	0.300	0.275	0.275	0.275	0.275
62	0.000	0.000	0.260	0.260	0.260	0.350	0.350	0.350	0.350	0.350	0.350
63	0.000	0.000	0.195	0.195	0.195	0.275	0.275	0.275	0.275	0.275	0.275
64	0.000	0.000	0.195	0.195	0.195	0.200	0.200	0.275	0.275	0.275	0.275
65	0.000	0.200	0.250	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
66	0.000	0.175	0.325	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
67	0.000	0.175	0.325	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
68	0.000	0.175	0.325	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
69 to 74	0.000	0.175	0.325	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

General - Female

	Service										
Age	<=3	4	5	6 to 19	20 to 23	24	25	26 to 28	29	30	>=31
<=48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.275	0.350	0.300
50	0.000	0.000	0.000	0.000	0.035	0.035	0.060	0.060	0.275	0.400	0.300
51	0.000	0.000	0.000	0.000	0.035	0.035	0.060	0.060	0.275	0.300	0.225
52	0.000	0.000	0.000	0.000	0.035	0.035	0.060	0.060	0.250	0.275	0.225
53	0.000	0.000	0.000	0.000	0.035	0.035	0.060	0.060	0.250	0.275	0.225
54	0.000	0.000	0.000	0.000	0.035	0.035	0.060	0.060	0.250	0.275	0.225
55 to 59	0.000	0.000	0.000	0.000	0.050	0.050	0.080	0.080	0.300	0.325	0.225
60	0.000	0.000	0.095	0.095	0.095	0.250	0.250	0.325	0.450	0.300	0.200
61	0.000	0.000	0.120	0.120	0.120	0.275	0.275	0.250	0.250	0.250	0.250
62	0.000	0.000	0.215	0.215	0.215	0.425	0.425	0.400	0.400	0.400	0.400
63	0.000	0.000	0.180	0.180	0.180	0.275	0.375	0.275	0.275	0.275	0.275
64	0.000	0.000	0.195	0.195	0.195	0.325	0.325	0.250	0.250	0.250	0.250
65	0.000	0.150	0.400	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
66	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
67	0.000	0.150	0.400	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
68	0.000	0.150	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
69	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
70 to 74	0.000	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
>=75	0	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Active Retirement Rates (continued):

Teachers - Male

	Service										
Age	<=3	4	5	6 to 19	20 to 23	24	25	26 to 28	29	30	>=31
<=48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.300	0.300	0.300
50	0.000	0.000	0.000	0.000	0.025	0.025	0.065	0.065	0.300	0.300	0.300
51	0.000	0.000	0.000	0.000	0.025	0.025	0.065	0.065	0.300	0.300	0.300
52	0.000	0.000	0.000	0.000	0.025	0.025	0.065	0.065	0.325	0.325	0.250
53	0.000	0.000	0.000	0.000	0.025	0.025	0.065	0.065	0.325	0.325	0.250
54	0.000	0.000	0.000	0.000	0.025	0.025	0.065	0.065	0.325	0.325	0.250
55	0.000	0.000	0.000	0.000	0.045	0.045	0.090	0.090	0.325	0.325	0.250
56	0.000	0.000	0.000	0.000	0.045	0.045	0.090	0.090	0.325	0.325	0.250
57	0.000	0.000	0.000	0.000	0.045	0.045	0.090	0.090	0.325	0.325	0.250
58	0.000	0.000	0.000	0.000	0.045	0.045	0.090	0.090	0.325	0.325	0.250
59	0.000	0.000	0.000	0.000	0.045	0.045	0.090	0.090	0.350	0.300	0.250
60	0.000	0.000	0.120	0.120	0.120	0.300	0.300	0.300	0.400	0.250	0.250
61	0.000	0.000	0.140	0.140	0.140	0.250	0.250	0.250	0.250	0.250	0.250
62	0.000	0.000	0.225	0.225	0.225	0.400	0.350	0.350	0.350	0.350	0.350
63	0.000	0.000	0.180	0.180	0.180	0.500	0.250	0.250	0.250	0.250	0.250
64	0.000	0.000	0.210	0.210	0.210	0.400	0.250	0.150	0.150	0.150	0.150
65	0.000	0.300	0.300	0.325	0.325	0.325	0.200	0.200	0.200	0.200	0.200
66	0.000	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
67	0.000	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
68	0.000	0.225	0.250	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
69 to 74	0.000	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225	0.225
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Teachers - Female

	Service										
Age	<=3	4	5	6 to 19	20 to 23	24	25	26 to 28	29	30	>=31
<=48	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.275	0.275	0.275
50	0.000	0.000	0.000	0.000	0.035	0.035	0.055	0.055	0.275	0.275	0.275
51	0.000	0.000	0.000	0.000	0.035	0.035	0.055	0.055	0.275	0.275	0.275
52	0.000	0.000	0.000	0.000	0.035	0.035	0.055	0.055	0.325	0.400	0.250
53	0.000	0.000	0.000	0.000	0.035	0.035	0.055	0.055	0.325	0.350	0.250
54	0.000	0.000	0.000	0.000	0.035	0.035	0.055	0.055	0.325	0.400	0.300
55	0.000	0.000	0.000	0.000	0.060	0.060	0.095	0.095	0.325	0.400	0.300
56	0.000	0.000	0.000	0.000	0.060	0.060	0.095	0.095	0.325	0.400	0.275
57	0.000	0.000	0.000	0.000	0.060	0.060	0.095	0.095	0.325	0.450	0.300
58	0.000	0.000	0.000	0.000	0.060	0.060	0.095	0.095	0.325	0.450	0.325
59	0.000	0.000	0.000	0.000	0.060	0.060	0.095	0.095	0.450	0.375	0.300
60	0.000	0.000	0.135	0.135	0.135	0.300	0.450	0.450	0.450	0.500	0.325
61	0.000	0.000	0.150	0.150	0.150	0.300	0.400	0.350	0.350	0.350	0.350
62	0.000	0.000	0.250	0.250	0.250	0.500	0.500	0.425	0.425	0.425	0.425
63	0.000	0.000	0.190	0.190	0.190	0.500	0.500	0.325	0.325	0.325	0.325
64	0.000	0.000	0.225	0.225	0.225	0.500	0.500	0.325	0.325	0.325	0.325
65	0.000	0.150	0.350	0.375	0.375	0.375	0.350	0.350	0.350	0.350	0.350
66	0.000	0.150	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375	0.375
67	0.000	0.150	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
68	0.000	0.150	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275	0.275
69	0.000	0.150	0.325	0.325	0.325	0.325	0.325	0.325	0.325	0.325	0.325
70 to 74	0.000	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300	0.300
>=75	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Active Retirement Rates (continued):

Law Enforcement - Male and Female

	Service					
Age	<=3	4	5 to 14	15 to 28	29	>=30
<=48	0.000	0.000	0.000	0.000	0.000	0.000
49	0.000	0.000	0.000	0.000	0.750	0.600
50 to 54	0.000	0.000	0.000	0.090	0.750	0.600
55	0.000	0.500	0.500	0.500	0.750	0.500
56 to 59	0.000	0.150	0.175	0.175	0.750	0.500
60 to 64	0.000	0.200	0.200	0.200	0.750	0.500
65	0.000	0.250	0.250	0.250	0.250	0.250
66 to 74	0.000	0.300	0.300	0.300	0.300	0.300
>=75	0.000	1.000	1.000	1.000	1.000	1.000

Inactive Vested Retirement Rates: Age 55 with 20 or more years of service; age 63 with 5 or more years of service, but less than 20 years of service.

Missing Participant Data: Actives and terminated vested who do not have plan code are assumed to be enrolled in plans based on enrollment assumptions.

Missing date of birth or invalid date of birth are assumed an average value of the group. Invalid gender codes are replaced with the default of male.

Any other missing census item for a given participant was assumed to equal the average value of that item over all other participants of the same status for whom the item is known.

Participation and Coverage Election: 100% of employees eligible to retire and receive subsidized postretirement welfare coverage were assumed to elect medical and prescription drug coverage. All participants are assumed to be enrolled in plans based on enrollment assumptions.

Dependents: Demographic data was available for spouses of current retirees. For future retirees, husbands were assumed to be four years older than their wives. 10% of future retirees who elect to continue their health coverage at retirement were assumed to have an eligible spouse who also opts for health coverage at that time.

Payroll Increases: Assumed to be 2.75%.

Data Adjustments:	There was evidence some child records were reported as subscribers. We assumed retirees under age 27 were children. Matching spouses of retirees to retirees when they were covered under split contracts (one Medicare eligible and the other not) was problematic. Additionally, surviving spouses who are not receiving survivor benefits under the retirement plan were not readily distinguishable from retirees. We believe that there are spouses of retirees that we have valued as retirees with the retiree subsidy. No adjustment has been made to the valuation liabilities.
Per Capita Cost Development:	
Medical and Prescription Drug	Per capita claims costs were based on actual incurred claim experience for the periods January 1, 2015 through December 31, 2016. Claims were separated by Medicare and Non-Medicare participants, then adjusted as follows: ➤ total claims were divided by the number of adult members to yield a per capita claim, ➤ the per capita claim was trended to the midpoint of the valuation year at assumed trend rates, and the per capita claim was adjusted for the effect of any plan changes Actuarial factors were then applied to the per capita claims to estimate individual retiree and spouse costs by age and by gender. Medicare Advantage plans were valued by actuarially adjusting the insured premium rates by age and gender.
Administrative Expenses	Administrative expenses were based on a projection furnished by Segal.

Per Capita Health Costs: 2017 medical and prescription drug claims costs, excluding assumed expenses, are shown in the table below for retirees and for spouses at selected ages. These costs are net of deductibles and other benefit plan cost sharing provisions.

Non-Medicare

	Medical Traditional				Traditional Prescription Drug			
	Retiree		Spouse		Retiree		Spouse	
Age	Male	Female	Male	Female	Male	Female	Male	Female
50	$4,992	$5,686	$3,487	$4,565	$1,750	$1,993	$1,222	$1,601
55	5,928	6,121	4,666	5,284	2,078	2,146	1,636	1,853
60	7,040	6,597	6,246	6,129	2,468	2,313	2,190	2,149
65	8,361	7,107	8,361	7,107	2,931	2,492	2,931	2,492
70	9,691	7,659	9,691	7,659	3,397	2,685	3,397	2,685
75	10,443	8,244	10,443	8,244	3,661	2,890	3,661	2,890
80	11,246	8,888	11,246	8,888	3,943	3,116	3,943	3,116

	Medical Enhanced				Enhanced Prescription Drug			
	Retiree		Spouse		Retiree		Spouse	
Age	Male	Female	Male	Female	Male	Female	Male	Female
50	$5,801	$6,607	$4,052	$5,305	$2,104	$2,396	$1,470	$1,924
55	6,889	7,112	5,422	6,141	2,499	2,580	1,966	2,227
60	8,181	7,666	7,258	7,122	2,967	2,780	2,632	2,583
65	9,716	8,259	9,716	8,259	3,524	2,995	3,524	2,995
70	11,261	8,900	11,261	8,900	4,084	3,228	4,084	3,228
75	12,136	9,580	12,136	9,580	4,401	3,475	4,401	3,475
80	13,068	10,328	13,068	10,328	4,740	3,746	4,740	3,746

	Medical and Rx CDHP			
	Retiree		Spouse	
Age	Male	Female	Male	Female
50	$6,552	$7,463	$4,576	$5,992
55	7,781	8,033	6,124	6,936
60	9,241	8,659	8,198	8,044
65	10,975	9,328	10,975	9,328
70	12,720	10,053	12,720	10,053
75	13,707	10,821	13,707	10,821
80	14,761	11,666	14,761	11,666

Medicare – Non Medicare Advantage

	Medical Traditional				Prescription Drug			
	Retiree		Spouse		Retiree		Spouse	
Age	Male	Female	Male	Female	Male	Female	Male	Female
50	$512	$583	$358	$468	$1,750	$1,993	$1,222	$1,601
55	608	628	479	542	2,078	2,146	1,636	1,853
60	722	677	641	629	2,468	2,313	2,190	2,149
65	858	729	858	729	2,931	2,492	2,931	2,492
70	994	786	994	786	3,397	2,685	3,397	2,685
75	1,072	846	1,072	846	3,661	2,890	3,661	2,890
80	1,154	912	1,154	912	3,943	3,116	3,943	3,116

Medicare – Medicare Advantage

	Medicare Advantage (Basic)				Medicare Advantage (Enhanced)			
	Retiree		Spouse		Retiree		Spouse	
Age	Male	Female	Male	Female	Male	Female	Male	Female
50	$837	$953	$585	$765	$1,310	$1,492	$915	$1,198
55	994	1,026	782	886	1,555	1,606	1,224	1,387
60	1,180	1,106	1,047	1,028	1,847	1,731	1,639	1,608
65	1,402	1,192	1,402	1,192	2,194	1,865	2,194	1,865
70	1,625	1,284	1,625	1,284	2,543	2,010	2,543	2,010
75	1,751	1,382	1,751	1,382	2,740	2,163	2,740	2,163
80	1,886	1,490	1,886	1,490	2,951	2,332	2,951	2,332

Health Care Cost Trend Rates:

Health care trend measures the anticipated overall rate at which health plan costs are expected to increase in future years. The rates shown below are "net" and are applied to the net per capita costs shown above. The trend shown for a particular plan year is the rate that is applied to that year's cost to yield the next year's projected cost.

	Rate (%)			
Year Ending December 31,	Medical Non-Medicare	Prescription Drug	Medicare Advantage	Admin.
2017	6.50%	7.25%	4.00%	3.00%
2018	6.25%	7.00%	4.00%	3.00%
2019	6.00%	6.75%	4.00%	3.00%
2020	5.75%	6.50%	4.00%	3.00%
2021	5.50%	6.25%	5.00%	3.00%
2022	5.25%	6.00%	5.00%	3.00%
2023	5.00%	5.75%	5.00%	3.00%
2024	5.00%	5.50%	5.00%	3.00%
2025	5.00%	5.25%	5.00%	3.00%
2026 & later	5.00%	5.00%	5.00%	3.00%

The trend rate assumptions were developed using Segal's internal guidelines, which are established each year using data sources such as the 2017 Segal Health Trend Survey, internal client results, trends from other published surveys prepared by the S&P Dow Jones Indices, consulting firms and brokers, and CPI statistics published by the Bureau of Labor Statistics.

2017 Plan Changes and Plan Enrollment Assumptions are valued by adjusting the trend for 2017-2021 for enrollment migration. See page 40 for a description of the 2017 Plan Changes. The actual trend for 2017 was 7.24% for non-Medicare claims and 1.57% for Medicare claims.

Medicare Part D Subsidy Assumption: GASB guidelines prohibit the offset of OPEB obligations by the future value of Medicare Part D subsides. Therefore, these calculations do not include an estimate for retiree prescription drug plan federal subsidies that the North Carolina State Health Plan may be eligible to receive for plan years beginning in 2006.

Retiree Contribution Increase Rate: Retiree contributions for medical and prescription drugs were assumed to increase at the same blended trend rate as medical and prescription drug cost. 2017 trend on contributions was adjusted to expected 2018 contribution rates, including anticipated wellness credits and enrollment migration. The average contribution increased by 14.8% from 2017 to 2018 in our valuation as a result of these adjustments.

Administrative Expenses: An administrative expense load of $260 per participant increasing at 3.0% per year thereafter was added to projected incurred claims cost in developing the benefit obligations.

Plan Design: Development of plan liabilities was based on the substantive plan of benefits in effect as described in Exhibit III.

Maximum Benefits: There are no annual or lifetime maximum benefits assumed.

Plan Enrollment Assumptions: Based on most recent financial report:

Non-Medicare Retiree	**2017**	**2018**	**2019**	**2020**	**2021+**
Traditional Med	43.7%	44.7%	44.0%	43.2%	42.5%
Enhanced Med	52.8%	55.3%	56.0%	56.8%	57.5%
CDHP Med+Rx	3.5%	0.0%			
Traditional Rx	43.7%	44.7%	44.0%	43.2%	42.5%
Enhanced Rx	52.8%	55.3%	56.0%	56.8%	57.5%
Med Retiree					
Traditional Med	25.4%	24.4%	23.4%	22.4%	21.4%
Traditional Rx	25.4%	24.4%	23.4%	22.4%	21.4%
MA Base	62.6%	63.6%	64.6%	65.6%	66.6%
MA Enhanced	12.0%	12.0%	12.0%	12.0%	12.0%

Health Care Reform Assumption: This valuation does not include the potential impact of any future changes due to the Patient Protection and Affordable Care Act (PPACA) and the Health Care and Education Reconciliation Act (HCERA) of 2010 other than the excise tax on high cost health plans beginning in 2020 (reflected with this valuation) and those previously adopted as of the valuation date.

Assumption Changes since Prior Valuation: There are three general groups of demographic assumptions. Which demographic assumptions applied to the individual were based on agency code in the prior valuation. This year we refined the process, and non-teachers at schools and universities were mapped to demographic assumptions by agency and job code. This better aligns with the pension valuations.

This year the medical and prescription drug claims cost were changed based on most recent experience.

Medical and prescription drug trend rates were changed to current schedule.

Enrollment assumptions were updated to model expected migrations among plan options over the next few years.

2018 Contribution changes were known as of the date the report was signed. These items have been reflected in our trend assumptions.

EXHIBIT III

Summary of Plan

This exhibit summarizes the major benefit provisions as included in the valuation. To the best of our knowledge, the summary represents the substantive plans as of the measurement date. It is not intended to be, nor should it be interpreted as, a complete statement of all benefit provisions.

Eligibility:	Participants in the North Carolina State Health Plan for Teachers and State Employees who retire from the State, the University of North Carolina System, community colleges, local school systems, and certain other component units are eligible to continue to participate in the State Health Plan in retirement if they meet certain criteria. Former employees who are eligible to receive medical benefits are long-term disability beneficiaries of the Disability Income Plan of North Carolina (DIPNC) and retirees of the Teachers' and State Employees' Retirement System (TSERS), the Consolidated Judicial Retirement system (CJRS), the Legislative Retirement System (LRS), the University Employees' Optional Retirement Program (UEORP), and a small number of local governments. General retirement requirements are as follows: **Law Enforcement Officer:** ➤ age 50 and 15 years of service; ➤ age 55 and 5 years of service; or ➤ any age with 30 or more years of service. **All Others:** ➤ age 50 and 20 years of service; ➤ age 60 and 5 years of service; or ➤ any age with 30 or more years of service.
Benefit Types:	Traditional, Enhanced and CDHP are offered to non-Medicare participants, and Traditional, MA and MA+ are offered to Medicare eligible participants.
Duration of Coverage:	Lifetime for retirees and dependents
Dependent Benefits:	Same as retirees

Retiree Contributions:

Monthly contributions, effective January 1, 2017, are shown below.

For Retirees hired prior to October 1, 2006 (February 1, 2007 for legislators):

	Non-Medicare			Medicare		
	Traditional	Enhanced	CDHP	Traditional	MA	MA+
Retiree	$0.00	$105.04*	$80.00 *	$0.00	$0.00	$64.00
Spouse	562.10	668.48	505.90	408.08	124.80	188.80

* Reduced by Wellness incentive credits for those who participate.

For Retirees hired after October 1, 2006 (February 1, 2007 for legislators), contributions are defined as a percentage of the total premium costs based on the following service based schedule:

Years of Service at Retirement	Retiree Contribution Percentage
5 – 9.99	100%
10 – 19.99	50%
20 or more	0%

100% of the total premium costs are show below:

	Non-Medicare			Medicare		
	Traditional	Enhanced	CDHP	Traditional	MA	MA+
Retiree	$479.48	$584.52	$559.48	$372.56	$124.80	$188.80
Spouse	562.10	668.48	505.90	408.08	124.80	188.80

* Reduced by Wellness incentive credits for those who participate.

Benefit Descriptions (As of January 1, 2017):

PPO Traditional	**In-Network**	**Out-Of-Network**
Medical		
Annual Deductible	$1,080/$3,240	$2,160/$6,480
Coinsurance	70%	50%
Coinsurance Maximum	$4,388/$13,164	$8,776/$26,328
Lifetime Maximum	Unlimited	Unlimited
Office Visit copay		
Primary Care	$40	Ded. & coins.
Specialist	$94	Ded. & coins.
Urgent Care	$100	$100
Inpatient Hospitalization	$337 + ded. & coins.	$337 + ded. & coins.
Outpatient Hospitalization	ded. & coins.	ded. & coins.
Emergency Room	$337 + ded. & coins.	same as In-Network
Chiropractic	$72	Ded. & coins.
Physical, Occupational or Speech Therapy	$72	Ded. & coins.
Mental Health, Chemical Dependency	$40	Ded. & coins.

Prescription Drugs *(up to 30 day supply)*	
Tier 1	$16
Tier 2	$47
Tier 3	$74
Tier 4 –Generic Specialty	10% coins., $100 max.
Tier 5 – Preferred Specialty	25% coins., $103 max.
Tier 6 – Non-Preferred Specialty	25% coins., $133 max.
Brand drug with a generic equivalent	Tier 1 copay plus the difference in the cost to the Plan between the generic and brand name drug, not to exceed $100 per 30-day supply of the brand name medication.
Preferred diabetic testing supplies	$10
Non-Preferred diabetic testing supplies	$74
Out-of-Pocket Maximum	$3,360

Coverage becomes secondary when former employees become eligible for Medicare.

PPO Enhanced	In-Network	Out-Of-Network
Medical		
Annual Deductible	$1,250/$3,750	$2,500/$7,500
Coinsurance	80%	60%
Out-of-Pocket Maximum	$4,350/$10,300	$8,700/$26,100
Lifetime Maximum	Unlimited	Unlimited
Office Visit copay		
Primary Care	$25	Ded. & coins.
Specialist	$85	Ded. & coins.
Urgent Care	$70	$70
Inpatient Hospitalization	$450 + ded. & coins.	$450 + ded. & coins.
Outpatient Hospitalization	ded. & coins.	ded. & coins.
Emergency Room	$300 + ded. & coins.	same as In-Network
Chiropractic	$52	Ded. & coins.
Physical, Occupational or Speech Therapy	$52	Ded. & coins.
Mental Health, Chemical Dependency	$25	Ded. & coins.

Prescription Drugs *(up to 30 day supply)*	
Tier 1	$5
Tier2	$30
Tier 3	Ded. & 20% coins.
Tier 4 –Generic Specialty	$100
Tier 5 – Preferred Specialty	$250
Tier 6 – Non-Preferred Specialty	Ded. & 20% coins.
Brand drug with a generic equivalent	Tier 1 copay plus the difference in the cost to the Plan between the generic and brand name drug, not to exceed $100 per 30-day supply of the brand name medication.
Preferred diabetic testing supplies	$5
Non-Preferred testing supplies	Ded. & 20% coins.
Out-of-Pocket Maximum	$2,500

Coverage becomes secondary when former employees become eligible for Medicare.

CDHP	In-Network	Out-Of-Network
Medical & Prescription Drug		
Annual Deductible	$1,500/$4,500	$3,000/$9,000
Coinsurance	85%	65%
Out-of-Pocket Maximum	$3,500/$10,500	$7,000/$21,000
Lifetime Maximum	Unlimited	Unlimited
HRA	$600/$1,800	$600/$1,800

MA	MA-PDP Basic	MA-PDP Enhanced
Medical		
Annual Deductible	$0	$0
Coinsurance	80%	80%
Coinsurance Maximum	$4,000	$3,300
Lifetime Maximum	Unlimited	Unlimited
Office Visit copay		
Primary Care	$20	$15
Specialist	$40	$35
Preventive Care	$0	$0
Emergency Room	$65	$65

Prescription Drugs	**MA-PDP Basic**	**MA-PDP Enhanced**
Retail (up to 31 day supply)		
Tier 1	$10	$10
Tier 2	$40	$35
Tier 3	$64	$50
Tier 4	25% coins., $100 max.	25% coins., $100 max.
Out-of-Pocket Maximum	$2,500	$2,500
Mail Order (up to 90 day supply)		
Tier 1	$24	$20
Tier 2	$80	$70
Tier3	$128	$100
Tier 4	25% coins., $300 max.	25% coins., $200 max.
Out-of-Pocket Maximum (individual)	$2,500	$2,500

Plan Changes:

Effective January 1, 2017 (reflected in the prior valuation):

Enhanced Plan:

- Deductible increased from $700 for Medical to $1,250 for combined Medical and Prescription Drug.
- Medical coinsurance maximum of $3,210 is replaced with Out-of-Pocket maximum of $4,350.
- Primary Care copays decreased from $15 to $10 and from $30 to $25 for selected and non-selected providers respectively.
- Specialist copays changed from $60 to $45 for selected providers and from $70 to $85 for non-selected providers.
- Non-Blue Option hospital inpatient copay increased from $233 to $450.
- Emergency room copay increased from $233 to $300.

- Copays for prescription drugs Tiers 1-3 changed from $12/$40/$64 to $5/$30/deductible & coinsurance.
- Tiers 4 and 5 in 2016 became Tiers 5 and 6 in 2017.
- Tier 4 (low cost/generic specialty) of prescription drugs was introduced with a copay of $100.
- Copays for prescription drugs Tier 5 went from 25% ($100 maximum) to $250 copay and copays for prescription drugs Tier 6 went from 25% ($132 maximum) to deductible & coinsurance.

Traditional (formerly Basic) Plan:

- Deductible increased from $1,054 to $1,080.
- Coinsurance maximum for medical services increased from $4,282 to $4,388.
- Pharmacy maximum increased from $3,294 to $3,360.
- Office visit copays increased from $39 to $40 and from $92 to $94 for Primary Care and Specialist respectively.
- Emergency room and hospital inpatient copays increased from $329 to $337.
- Copays for prescription drugs Tiers 1-3 increased from $15/$46/$72 to $16/$47/$74.
- Tiers 4 and 5 in 2016 became Tiers 5 and 6 in 2017.
- Tier 4 of prescription drugs was introduced with coinsurance of 10% ($100 maximum).
- Maximums for prescription drugs Tiers 5 and 6 increased from $100 and $132 to $103 and $133 respectively.

Effective January 1, 2018:

The CDHP option will be discontinued.

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EXHIBIT IV
Definitions of Terms

The following list defines certain technical terms for the convenience of the reader:

Assumptions or Actuarial Assumptions: The estimates on which the cost of the Plan is calculated including:

(a) Investment return — the rate of investment yield that the Plan will earn over the long-term future;

(b) Mortality rates — the death rates of employees and pensioners; life expectancy is based on these rates;

(c) Retirement rates — the rate or probability of retirement at a given age;

(d) Turnover rates — the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement.

Actuarial Present Value of Total Projected Benefits (APB): Present value of all future benefit payments for current retirees and active employees taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions.

Normal Cost: The amount of contributions required to fund the benefit allocated to the current year of service.

Actuarial Accrued Liability For Actives: The equivalent of the accumulated normal costs allocated to the years before the valuation date.

Actuarial Accrued Liability For Retirees: The single sum value of lifetime benefits to existing retirees. This sum takes account of life expectancies appropriate to the ages of the retirees and of the interest which the sum is expected to earn before it is entirely paid out in benefits.

Actuarial Value of Assets (AVA):	The value of assets used by the actuary in the valuation. These may be at market value or some other method used to smooth variations in market value from one valuation to the next.
Funded Ratio:	The ratio AVA/AAL.
Unfunded Actuarial Accrued Liability (UAAL):	The extent to which the actuarial accrued liability of the Plan exceeds the assets of the Plan. There is a wide range of approaches to paying off the unfunded actuarial accrued liability, from meeting the interest accrual only to amortizing it over a specific period of time.
Amortization of the Unfunded Actuarial Accrued Liability:	Payments made over a period of years equal in value to the Plan's unfunded actuarial accrued liability.
Investment Return (discount rate):	The rate of earnings of the Plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next. If the plan is funded on a pay-as-you-go basis, the discount rate is tied to the expected rate of return on day-to-day employer funds.
Covered Payroll:	Annual reported salaries for all active participants on the valuation date.
ARC as a Percentage of Covered Payroll:	The ratio of the annual required contribution to covered payroll.
Health Care Cost Trend Rates:	The annual rate of increase in net claims costs per individual benefiting from the Plan.
Annual Required Contribution (ARC): unfunded	The ARC is equal to the sum of the normal cost and the amortization of the actuarial accrued liability.

Net OPEB Obligation (NOO):	The NOO is the cumulative difference between the ARC and actual contributions made. If the plan is not pre-funded, the actual contribution would be equal to the annual benefit payments less retiree contributions. There are additional adjustments in the NOO calculations to adjust for timing differences between cash and accrual accounting, and to prevent double counting of OPEB plan costs.

EXHIBIT V

Accounting Requirements

The Governmental Accounting Standards Board (GASB) issued Statement Number 43 – *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans,* and Statement Number 45 – *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions.* Under these statements, all state and local government entities that provide other post employment benefits (OPEB) are required to report the cost of these benefits on their financial statements. The accounting standards supplement cash accounting, under which the expense for postemployment benefits is equal to benefit and administrative costs paid on behalf of retirees and their dependents (*i.e.*, a pay-as-you-go basis).

The statements cover postemployment benefits of health, prescription drug, dental, vision and life insurance coverage for retirees; long-term care coverage, life insurance and death benefits that are *not* offered as part of a pension plan; and long-term disability insurance for employees. The benefits valued in this report are limited to those described in Exhibit III of Section 4, which are based on those provided under the terms of the substantive plan in effect at the time of the valuation and on the pattern of sharing costs between the employer and plan members. The projection of benefits is not limited by legal or contractual limits on funding the plan unless those limits clearly translate into benefit limits on the substantive plan being valued.

The new standards introduce an accrual-basis accounting requirement, thereby recognizing the employer cost of postemployment benefits over an employee's career. The standards also introduce a consistent accounting requirement for both pension and non-pension benefits.

The total cost of providing postemployment benefits is projected, taking into account assumptions about demographics, turnover, mortality, disability, retirement, health care trends, and other actuarial assumptions. These assumptions are summarized in Exhibit II of Section 4. This amount is then discounted to determine the actuarial present value of the total projected benefits (APB). The actuarial accrued liability (AAL) is the portion of the present value of the total projected benefits allocated to years of employment prior to the measurement date. The unfunded actuarial accrued liability (UAAL) is the difference between the AAL and actuarial value of assets in the Plan.

Once the UAAL is determined, the Annual Required Contribution (ARC) is determined as the normal cost (the APB allocated to the current year of service) and the amortization of the UAAL. This ARC is compared to actual contributions made and any difference is reported as the Net OPEB Obligation (NOO). In addition, Required Supplementary Information (RSI) must be reported, including historical information about the UAAL and the progress in funding the Plan. Exhibits IV and VI of Section

4 contain a definition of terms as well as more information about GASB 45 concepts.

The calculation of an accounting obligation does not, in and of itself, imply that there is any legal liability to provide the benefits valued, nor is there any implication that the Employer is required to implement a funding policy to satisfy the projected expense.

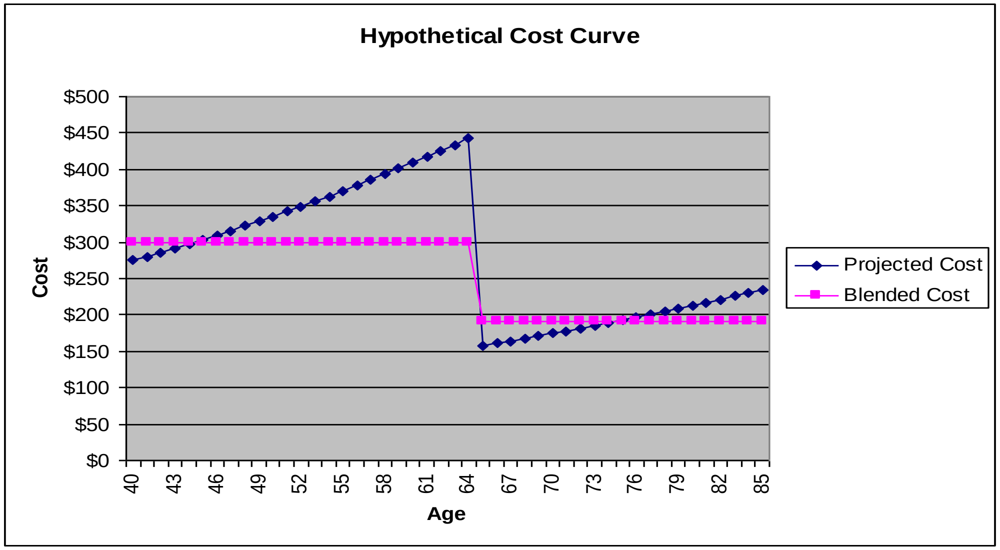
Actuarial calculations reflect a long-term perspective, and the methods and assumptions use techniques designed to reduce short term volatility in accrued liabilities and the actuarial value of assets, if any.

Actuarial valuations involve estimates of the value of reported amounts and assumptions about the probability of events far into the future, and the actuarially determined amounts are subject to continual revision as actual results are compared to past expectations and new estimates are made about the future.

EXHIBIT VI

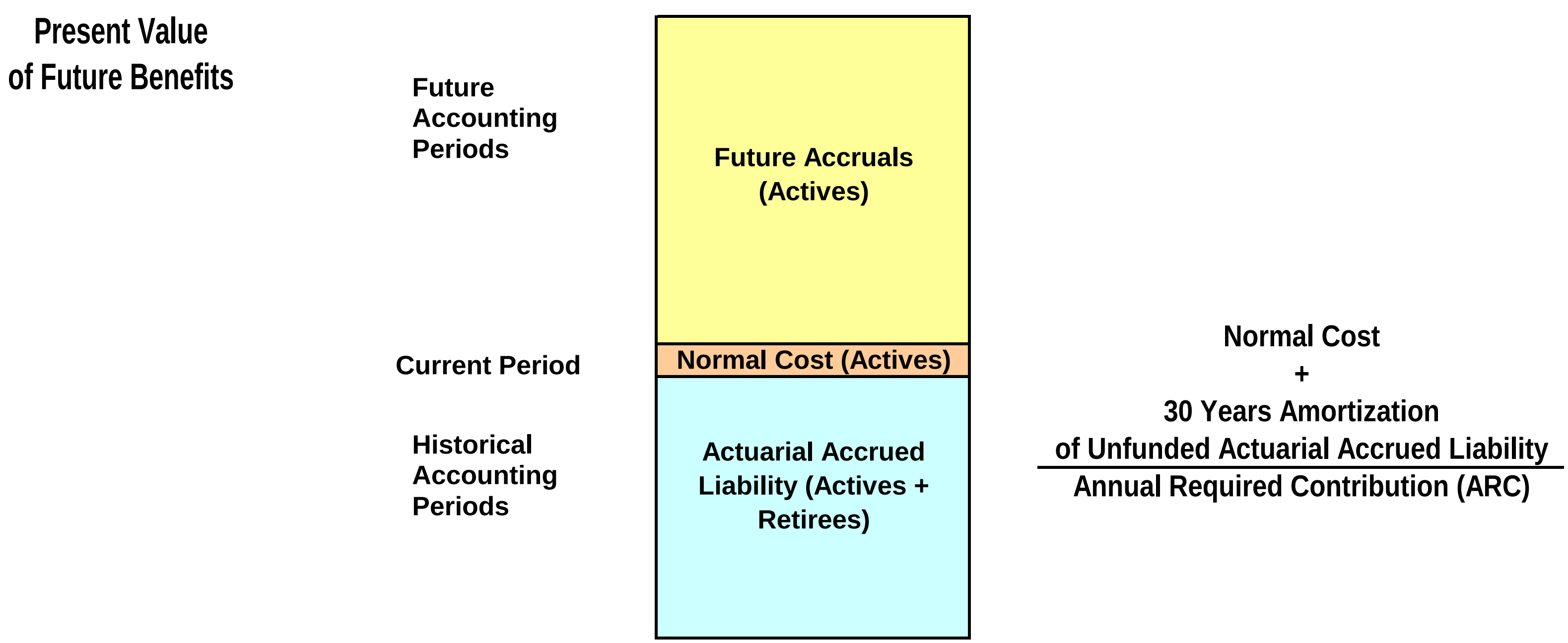
GASB 45 Concepts

The following graph illustrates why a significant accounting obligation may exist even though the retiree contributes most or all of the blended premium cost of the plan. The average cost for retirees is likely to exceed the average cost for the whole group, leading to an implicit subsidy for these retirees. The accounting standard requires the employer to identify and account for this implicit subsidy as well as any explicit subsidies the employer may provide.



This graph shows how the actuarial present value of the total projected benefits (APB) is broken down and allocated to various accounting periods. The exact breakdown depends on the actuarial cost method and amortization methods selected by the employer.

GASB 45 Measurement
Elements Using Actuarial Cost Methods



Net OPEB Obligation = $ARC_1 + ARC_2 + ARC_3 + ...$
$- Contribution_1 - Contribution_2 - Contribution_3 - ......$