Report on the Actuarial Valuation of Post Retirement Benefits of the Vermont State Employees' Retirement System

Prepared as of June 30, 2015

October 2015

buckconsultants

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Introduction

The Board of Trustees of the Vermont State Employees' Retirement System ("VSERS" or "the System") has engaged Buck Consultants, LLC ("Buck") to prepare an actuarial valuation of their OPEB (Other Post-employment Benefits, or, postretirement benefits other than pension) program as of June 30, 2015. The State Treasurer's Office provided the employee data and premium information used in the completion of this valuation.

The purposes of the valuation are to measure the current liabilities of the System for its post-retirement benefits program and to provide reporting and disclosure information for financial statements, governmental agencies and other interested parties. In addition, the valuation provides information that may be used to determine the level of contributions recommended to assure sound funding of such benefits. This valuation report contains information that is required for compliance with the Governmental Accounting Standards Board's Statement 43, ***Financial Reporting for Postemployment Benefit Plans Other than Pension Plans*** ("GASB 43") and Statement 45, Accounting and ***Financial Reporting by Employers for Postemployment Benefits Other than Pensions*** ("GASB 45").

Use of this report for any other purpose or by anyone other than the plan, the plan sponsor, or their auditors may not be appropriate and may result in mistaken conclusions due to failure to understand applicable assumptions, methodologies, or inapplicability of the report for that purpose. This report should not be provided except in its entirety. Because of the risk of misinterpretation of actuarial results, you should ask Buck to review any statement you wish to make on the results contained in this report. Buck will not accept any liability for any such statement made without review by Buck. No one other than the plan, plan sponsor or their auditors may make any representations or warranties based on any statements or conclusions contained in this report without the written consent of Buck.

Our calculations do not reflect any other postemployment benefits than those described in this report.

Funding Level

This valuation continues to reflect a change to the way prescription drug benefits for Medicare-eligible retirees are financed, as was originally reflected in our June 30, 2014 valuation. As of January 1, 2015, the drug benefits are being provided under a Medicare Part D Employer Group Waiver Plan (EGWP) arrangement. Prior to this change, VSERS was participating in the Retiree Drug Subsidy (RDS) program, in which the plan sponsor applies for a subsidy equal to 28% of gross Rx claims within certain parameters, typically representing subsidies equal to about 20% of gross Rx cost. Under the EGWP arrangement, the benefits available to participants do not materially change, but are provided through a plan which is directly contracted with Medicare and which receives several different sources of subsidies. The three material subsidies are the Direct Subsidy to EGWP, Coverage Gap Discounts on brand drugs, and Federal Reinsurance. Buck did not perform a robust financial analysis of the reasonability of BCBS Vermont's findings, nor on the effects of this change on medical premiums which are the basis of the valuation's per capita cost assumption; rather, we are relying on the 2015 premium information provided by System personnel and assuming that the premium reflects the cost savings from the EGWP arrangement and is suitable for use for measurements under GASB 43 and 45.

Prior to the 2014 valuation, we performed the calculations assuming that the System would continue its practice of paying for benefits on a pay-as-you-go basis, and contributing Medicare RDS into a dedicated and irrevocable trust fund. This approach qualified as partial prefunding under Governmental Accounting Standards, and it was determined that a 4.25% discount rate is reasonable for this purpose. Under guidance from the System provided to us for our 2014 valuation, we have prepared accounting schedules using results at a discount rate of 4.00% which assumes that prefunding will cease with the cessation of the Medicare Part D employer Retiree Drug Subsidies. Since prefunding is anticipated to cease, we note that the pay-as-you-go contribution scenario is significantly inconsistent with the plan accumulating adequate assets to make benefit payments when due. Continuing, increasing contributions will be expected to be required in order to fund future benefits.

As requested, we have also provided results under alternative scenarios that assumes a level of prefunding that is consistent with what was done for periods prior to January 1, 2015 (using a discount rate of 4.25%), as well as one assuming that the System's post-retirement medical benefits other than pensions are prefunded in a manner similar to that used for pensions (using a discount rate of 7.95%). Section II provides a summary of the principal valuation results in the form of the information required under GASB 45.

In addition to the different financial arrangement resulting in differences in prefunding level, the EGWP arrangement is treated differently than the RDS for accounting purposes. GASB Technical Bulletin No. 2006-1 disallowed the reflection of future RDS payments (e.g. those not yet accrued) as an offset to GASB 45 liabilities, and so we did not reflect future RDS payments in prior valuations. On the other hand, since the EGWP arrangement flows directly into reduced premiums, as opposed to the intra-governmental transfer of RDS, the subsidies received under the EGWP arrangement can be directly reflected in the GASB 43 and 45 calculations.

There were no other plan changes reflected in this valuation, except for the elimination of the little used HealthGuard PPO Plan option. Provisions of the Patient Protection and Affordable Care Act taking effect after June 30, 2010, were reflected in the valuation made as of that date, with the impact of any guidance subsequent issued being reflected in the valuation that followed the release of the guidance.

Assumptions

Assumptions related to decrement rates are updated in the 2015 valuation to reflect the Experience Study of the Vermont State Employees' Retirement System, which was presented to and accepted by the Board in 2015. The evaluation of the suitability of these assumptions for this GASB 45 valuation is beyond the scope of this assignment. The decremental assumptions are supplemented by demographic assumptions specifically related to retiree medical measurement such as participation.

As discussed, this report reflects two alternative discount rate scenarios. One scenario, using a 4.25% discount rate, is intended to illustrate the impact of pre-funding at the level of historic RDS payments. In addition, the fully-funded alternative scenario is being provided using a discount rate of 7.95% as is consistent with the single-rate equivalent recommended for the pension plan. These scenarios are for illustration only and we are not opining that their use is reasonable for GASB 43 and GASB 45 measurements.

The following assumptions have been updated for the June 30, 2015 valuation:

- Participation in the Premium Reduction Option (PRO) has been decreased from 50% to 35% based on the percentage of current eligible retirees who elected to participate tempered with actuarial judgement.
- The percentage of future retirees electing coverage who will cover a spouse has been updated to 60% for males and 50% for females. These percentages are based on an analysis of the prior 3 years of VSERS experience, tempered with actuarial judgement.
- Per capita cost assumptions were updated based on the July 1, 2015 premium rates and updated census information. In addition, the age morbidity curve used to age adjust per capita healthcare costs has been updated based on a study performed by Dale Yamamoto for the Society of Actuaries.
- Withdrawal, Disability, Retirement, and Mortality rates have been updated to reflect the results of the 2015 Experience Study.

While the actuarial assumptions developed for this analysis are considered reasonable for financial reporting purposes, it should be understood that there is a range of assumptions that could be deemed reasonable that would yield different results. Moreover, while the assumption set is considered reasonable based on prior plan experience, it should be understood that future plan experience may differ considerably from what has been assumed due to such factors as the following: retiree group benefits program experience differing from that anticipated by the assumptions; changes in assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and changes in retiree group benefits program provisions or applicable law. Retiree group benefits models necessarily rely on the use of approximations and estimates, and are sensitive to changes in these approximations and estimates. Small variations in these approximations and estimates may lead to significant changes in actuarial measurements. The measurement of the sensitivity of these results to changes in assumptions other than discount rate is beyond the scope of this assignment.

Data

Census data was provided by System personnel. Our analysis relies on the accuracy of the data. The data was not reviewed for consistency or completeness beyond that necessary to develop the analysis. Such a detailed review of the data and its sources is beyond the scope of this analysis. To the extent that the data is incomplete or incorrect, the results of the analysis are also incomplete or incorrect.

Please see the table in Section I for summary of change to the Unfunded Actuarial Accrued Liability experienced over the year.

Certification

Hope Manion is a Fellow of the Society of Actuaries and Kevin Penderghest is an Associate of the Society of Actuaries. Both Ms. Manion and Mr. Penderghest are Members of the American Academy of Actuaries and meet the Qualification Standards of the Academy in the health practice area to render the actuarial opinions contained herein. Mr. Penderghest has reviewed the overall reasonableness and consistency of these results. David Driscoll is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. Mr. Driscoll meets the Qualification Standards of the American Academy of Actuaries in the retirement practice area. Mr. Driscoll, as actuary for the retirement benefits provided by VSERS, has evaluated the reasonableness of the assumptions set for VSERS that are also used in this analysis. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and Ms. Manion and Mr. Penderghest are available to answer questions concerning it.

Respectfully Submitted,

Buck Consultants, LLC

Hope C. Manion, FSA, MAAA Principal, Consulting Actuary	10/29/2015 Date
David L. Driscoll, FSA, MAAA, EA Principal, Consulting Actuary	10/29/2015 Date
Kevin J. Penderghest, ASA, MAAA Senior Consultant, Actuary	10/29/2015 Date

Section I – Overview

The System experienced an increase in its Actuarial Accrued Liability for post-retirement benefits over the past year due to the following factors:

- Expected increases due to the passage of time;
- Demographic experience different than expected;
- Updated mortality assumption; and
- Updated age morbidity assumption.

These increases were partially offset by the following assumption changes:

- Lower than expected increases to premiums
- Updated future retirees' spouse coverage election assumption;
- Updated retirement, termination, and disability assumptions; and
- Updated retiree Premium Reduction Option election assumption.

In addition, the Unfunded Actuarial Accrued Liability was affected by return on assets slightly lower than expected.

Per unit per capita healthcare costs were updated based on recent plan premium equivalents and enrollment. Pre-Medicare premiums have increased more than expected based on our healthcare cost trend assumptions, while Post-Medicare premiums have increased less than expected. The age morbidity curve used to age-adjust per capita healthcare costs has been updated based on a study performed by Dale Yamamoto for the Society of Actuaries.

The percentages of future retirees electing spouse coverage has been updated to 60% for male retirees and 50% for female retirees. These percentages are based our analysis of the most recent 3 years of VSERS experience, tempered with actuarial judgement. The Retiree Premium Reduction Option ("PRO") election rate has been updated to 35% based the most recent year of experience for future retirees, while current retirees are valued with their actual PRO election.

The discount rate remains unchanged at 4.00%, which reflects that the System will no longer be contributing Medicare Part D refunds into a dedicated and irrevocable trust fund due to the adoption of the EGWP in 2015.

Assumptions related to decrement rates are updated to reflect the Experience Study of the Vermont State Employees' Retirement System, which was presented to and accepted by the Board in 2015. All other assumptions were the same as those used in 2014.

A summary of the resultant valuation assumptions is shown in Section VI.

All plan provisions were the same as those reflected in the 2014 valuation, except that the HealthGuard PPO Plan has been eliminated as a retiree option. Since so few retirees participated in that option, this has no significant impact on the valuation.

The actual asset return over the past year was approximately 1.73%, which was significantly lower than the fully funded expected rate of 8.10%.

We have updated our analysis surrounding the implementation of the High Cost Premium Excise Tax ("Cadillac Tax"). Based on our current understanding of how the tax will be assessed, we currently estimate the tax to increase total liabilities by 1.4%.

We have not made adjustments for other potential effects of any future health care reform legislation changes on VSERS liabilities. Please see Section VII for details.

Shown below is a reconciliation of the funded status from last year to this year under the 4.00% discount rate assumption.

6/30/2014 Unfunded Accrued Liability		$1,073,824,089
End of year service cost	42,834,313	
Interest cost	42,968,141	
Expected Benefit Payments	(37,416,308)	
Expected increase in assets	(1,531,236)	
6/30/2015 Expected Unfunded Accrued Liability		$1,120,678,999
Demographic experience different than expected and other refinements	5,033,043	
Updated per capita costs	(49,895,044)	
Assumption changes	16,770,669	
Asset gain	530,926	
6/30/2015 Unfunded Accrued Liability		$1,093,118,593

The expected increase in assets reflects expected discontinuance of RDS payments and expected return on assets of $1.5 million. The asset experience loss is comprised of $0.2 million in net benefits contribution lower than benefits paid and investment income of $1.2 million lower than expected, while being offset by $0.9 million in RDS payments higher than expected.

The fiscal 2016 Annual Required Contribution calculated on the "pay-as-you-go" discount rate basis, e.g. at a discount rate of 4.00%, is $69,020,949; we estimate the Annual Required Contribution calculated at 4.00% for the subsequent year (fiscal year ending June 30, 2017) to be $71,911,492.

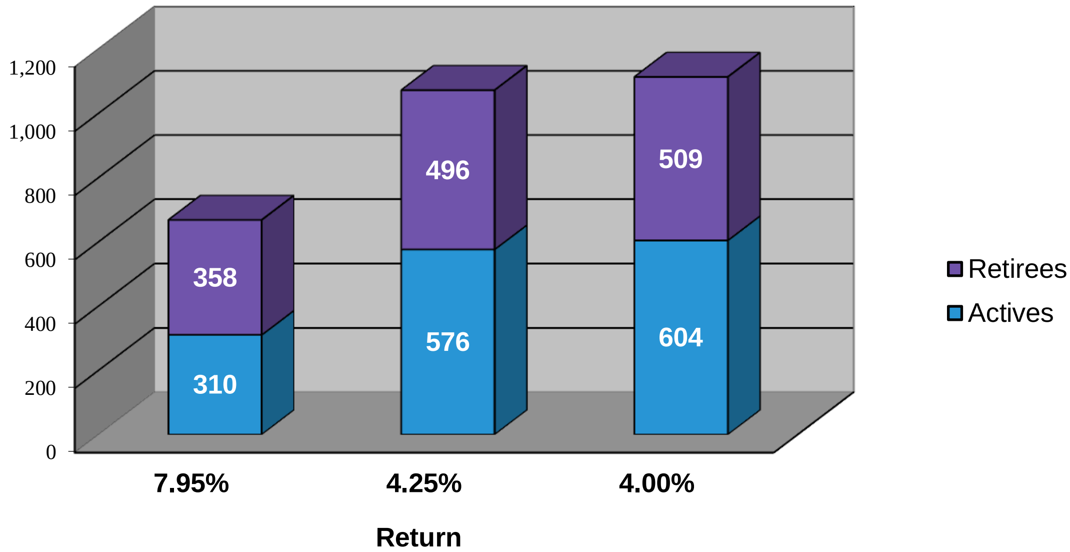
Please note, the funded status of the plan under GASB 45 requirements is not an appropriate measure for assessing the sufficiency of plan assets to cover estimated cost of settling the plan's obligations. The funded status measured under the "pay-as-you-go" 4.0% discount rate scenario or the 4.25% discount rate scenario is not appropriate for assessing the need for or the amount of future actuarially determined contributions.

Section II – Required Information

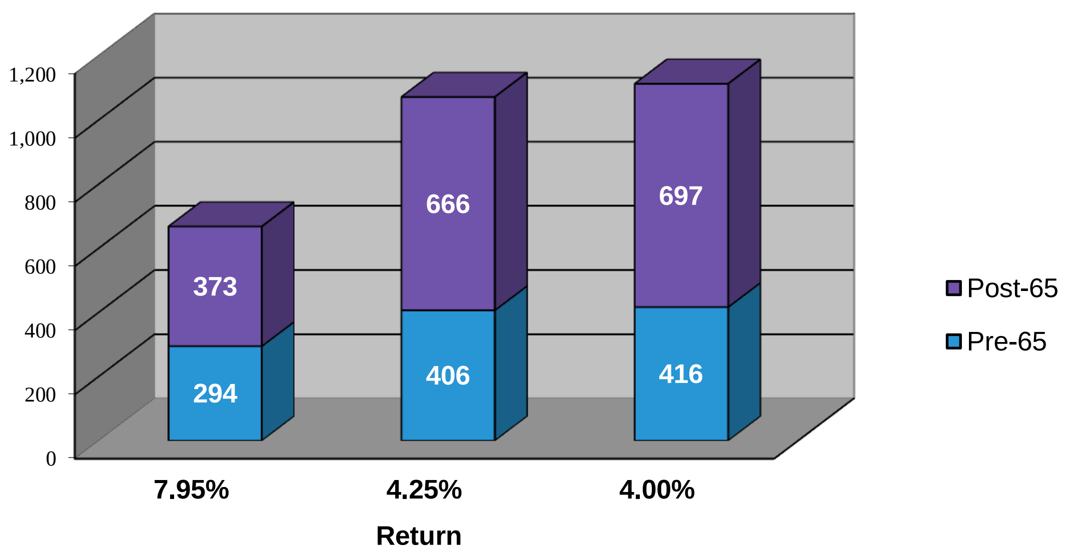
		Pre-Funding Basis	Partial-Funding Basis	Pay-as-you-go Basis
a)	Assumed discount rate	7.95%	4.25%	4.00%
b)	Actuarial value of assets	$19,904,458	$19,904,458	$19,904,458
c)	Actuarial accrued liability			
	Active Participants	$309,645,353	$575,734,378	$604,152,844
	Retired Participants	$358,126,342	$496,082,676	$508,870,207
	Total	$667,771,695	$1,071,817,054	$1,113,023,051
d)	Unfunded actuarial liability (c. - b.)	$647,867,237	$1,051,912,596	$1,093,118,593
e)	Funded ratio	3.0%	1.9%	1.8%
f)	Annual covered payroll	$488,949,089	$488,949,089	$488,949,089
g)	Unfunded actuarial liability as a percentage of covered payroll	132.5%	215.1%	223.6%
h)	Normal cost for the 2016 fiscal year	$15,970,194	$35,912,672	$38,215,013
i)	Amortization of unfunded actuarial liability for the 2016 fiscal year (30-year)	$31,363,913	$31,541,391	$31,607,919
j)	Interest on expected benefit payments	($1,578,943)	($851,590)	($801,983)
k)	Annual Required Contribution (ARC) for the 2016 fiscal year (h. + i. + j.)	$45,755,164	$66,602,473	$69,020,949
l)	Expected net retiree claims	$40,496,204	$40,496,204	$40,496,204
m)	Normal cost for the 2017 fiscal year	$16,688,853	$37,528,743	$39,934,689
n)	Amortization of unfunded actuarial liability for the 2017 fiscal year (30-year)	$32,655,041	$32,764,695	$32,827,285
o)	Interest on expected benefit payments	($1,674,428)	($903,090)	($850,482)
p)	Annual Required Contribution (ARC) for the 2017 fiscal year* (m. + n. + o.)	$47,669,466	$69,390,348	$71,911,492

* ARC for fiscal year 2017 is estimated using roll forward from Fiscal Year 2016 results.

Actuarial Accrued Liability in $ millions – retirees versus actives



Actuarial Accrued Liability in $ millions – pre-65 versus post-65

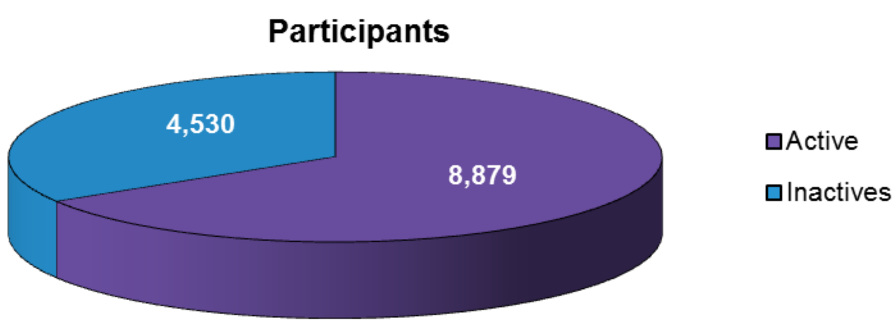


Section III – Membership Data and Medical Premium

Number of Participants Included In Valuation

	Total
Active	
Group A	6
Group C	442
Group D	48
Group F	7,979
Defined Contribution	404
Total	8,879
Retired[1]	4,530
Total	13,409

[1] Includes 24 July 1, 2015 retirements.



Monthly Gross Plan Premiums Effective January 1, 2015

	Gross Premium	Retirees	Dependent Spouses
Total Choice			
Retiree under 65	$938.05	99	0
Retiree over 65	$333.74	1,324	0
2 Person under 65	$1,876.11	60	60
2 Person over 65	$667.49	747	747
2 Person, 1 under 65 and 1 over 65	$1,271.80	117	117
Family, under 65	$2,579.64	16	16
Family, 2 under 65 and 1 over 65	$1,690.37	17	17
Family, 1 under 65 and 2 over 65	$1,086.06	6	6
Select Care POS			
Retiree under 65	$785.09	388	0
Retiree over 65	$270.18	580	0
2 Person under 65	$1,570.15	329	329
2 Person over 65	$540.36	406	406
2 Person, 1 under 65 and 1 over 65	$1,055.27	274	274
Family, under 65	$2,158.96	121	121
Family, 2 under 65 and 1 over 65	$1,405.58	33	33
Family, 1 under 65 and 2 over 65	$890.67	13	13
Total		4,530	2,139

*22 Medicare retirees declined EGWP benefits, which resulted in lower gross premium amounts; they were assumed to elect EGWP for valuation purposes and valued with the higher premium rate.

The Number of Active Members Distributed By Age and Service
as of June 30, 2015

	Service									
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	Total
AGE	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**	**No.**
Under 20	3	0	0	0	0	0	0	0	0	3
20 to 24	219	4	0	0	0	0	0	0	0	223
25 to 29	623	87	1	0	0	0	0	0	0	711
30 to 34	561	228	92	0	0	0	0	0	0	881
35 to 39	409	257	219	60	3	0	0	0	0	948
40 to 44	337	208	249	186	83	9	0	0	0	1,072
45 to 49	305	200	228	184	174	143	8	0	0	1,242
50 to 54	293	167	220	180	141	181	94	13	0	1,289
55 to 59	226	188	201	154	121	181	109	65	0	1,245
60 to 64	143	117	152	107	90	106	97	97	5	914
65 to 69	28	47	53	42	17	27	28	29	14	285
70 & up	12	5	13	6	6	6	4	7	7	66
TOTAL	3,159	1,508	1,428	919	635	653	340	211	26	8,879

Section IV – Required Supplementary Information

The Schedule of Funding Progress is required to be included in the State's Financial Statements

Schedule of Funding Progress with Assumptions Based on Current Policy on Funding (dollar amounts in thousands)

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)
June 30, 2015	$19,904	$1,113,023	$1,093,119	1.8%	$488,949	223.6%
June 30, 2014	$18,904	$1,092,728	$1,073,824	1.7%	$464,517	231.2%
June 30, 2013	$15,663	$947,864	$932,201	1.7%	$436,949	213.3%
June 30, 2012	$13,379	$1,011,783	$998,404	1.3%	$406,929	245.4%
June 30, 2011	$11,216	$1,009,792	$998,576	1.1%	$420,321	237.6%
June 30, 2010	$7,897	$925,183	$917,286	0.9%	$414,936	221.1%
June 30, 2009	$5,749	$780,748	$774,999	0.7%	$426,827	181.6%
June 30, 2008	$3,664	$754,690	$751,027	0.5%	$404,937	185.5%
June 30, 2007	$2,211	$606,499	$604,288	0.4%	$386,917	156.2%
June 30, 2006	$0	$552,152	$552,152	0.0%	$369,310	149.5%

These results are based on a discount rate of 3.75% for 2006 – 2007, 4.00% for 2007 – 2008, 4.25% for 2009 – 2013, and 4.00% for 2014 – 2015.

If the State were to change its funding policy to pre-fund the entire calculated Annual Required Contribution, prospectively, the Schedule of Funding Progress would look as follows:

Schedule of Funding Progress with Assumptions Based on Policy of Pre-Funding (dollar amounts in thousands)

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)
June 30, 2015	$19,904	$667,772	$647,867	3.0%	$488,949	132.5%
June 30, 2014	$18,904	$1,092,728	$1,073,824	1.7%	$464,517	231.2%
June 30, 2013	$15,663	$947,864	$932,201	1.7%	$436,949	213.3%
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June 30, 2010	$7,897	$925,183	$917,286	0.9%	$414,936	221.1%
June 30, 2009	$5,749	$780,748	$774,999	0.7%	$426,827	181.6%
June 30, 2008	$3,664	$754,690	$751,027	0.5%	$404,937	185.5%
June 30, 2007	$2,211	$606,499	$604,288	0.4%	$386,917	156.2%
June 30, 2006	$0	$552,152	$552,152	0.0%	$369,310	149.5%

These results are based on a discount rate of 3.75% for 2006 – 2007, 4.00% for 2007 – 2008, 4.25% for 2009 – 2013, 4.00% for 2014, and 7.95% for 2015.

Section V – Net OPEB Obligation

GASB Statement No. 45 requires the development of Annual OPEB Cost and Net OPEB Obligation (NOO). This development is shown in the following table.

Development of OPEB Cost and Net OPEB Obligation (NOO)

Year Ending June 30	Annual Required Contribution	Interest on NOO	Amortization of NOO	Annual OPEB Cost (1)+(2)-(3)	Actual Contribution	Change in NOO (4)-(5)	NOO Balance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2008	47,284,903	0	0	47,284,903	17,776,355	29,508,548	29,508,548
2009	58,666,959	1,180,342	853,250	58,994,051	19,893,129	39,100,922	68,609,470
2010	57,998,078	2,915,902	2,057,241	58,856,739	22,528,768	36,327,971	104,937,441
2011	67,030,307	4,459,841	3,146,528	68,343,620	27,394,474	40,949,146	145,886,587
2012	69,880,277	6,200,180	4,374,380	71,706,077	27,652,189	44,053,888	189,940,475
2013	67,977,179	8,072,470	5,695,328	70,354,321	25,557,683	44,796,638	234,737,113
2014	64,119,145	9,976,327	7,038,546	67,056,926	24,272,144	42,784,782	277,521,895
2015	71,495,862	11,100,876	8,024,646	74,572,092	29,028,016	45,544,075	323,065,971
2016	69,020,949	12,922,639	9,341,569	72,602,019			

The FYE June 30, 2015 actual contribution amount includes the Medicare Part D Retiree Drug Subsidy received by the State. This amount was treated as a contribution amount. However, we note that the Medicare Modernization Act which authorized the Retiree Drug Subsidy provided that the subsidy would be provided to the employer.

Section VI – Actuarial Assumptions and Methods

Vermont State Employees – All Groups

Assumed Investment Return:

4.00% per year, the assumed rate of return on general assets of the employer. This rate is based on guidance from the System that no additional funding will occur now that the EGWP arrangement was implemented in 2015. The 4.0% rate is considered reasonable for this purposes based on consistency with expected value produced by the 4th quarter 2014 GEMS economic model generator over a 30 year time horizon.

In addition, two alternative scenarios are presented. For a pre-funded plan, using 7.95%, the assumed rate of return on assets accumulated in the System's trust for benefit payments; and 4.25% for a partially funded plan, based on a level of funding consistent with the System's funding levels in years prior to 2014. Note that the fully funded discount rate is consistent with the single-equivalent rate used for the pension valuations, the derivation of which is discussed in our Experience Study of the Vermont State Employees' Retirement System; last year, fully funded results were also provided using a discount rate of 8.10%. Currently the assets of the Postemployment Benefit Trust are not invested in the same manner as the System, but it is assumed that the long term asset allocation will be the same as the System's overall asset allocation strategy.

***Actuarial cost method*:**

Projected Unit Credit with benefits attributed ratably from date of hire to first eligibility for retirement.

Actuarial Value of Assets:

Market Value.

Medical care and state share inflation:

Fiscal Year Ending	Pre-Medicare Inflation Rate	Post-Medicare Inflation Rate
2016	8.50%	6.25%
2017	8.00	6.00
2018	7.50	5.75
2019	7.00	5.50
2020	6.75	5.25
2021	6.50	5.00
2022	6.25	4.75
2023	6.00	4.50
2024	5.75	4.50
2025	5.50	4.50
2026	5.25	4.50
2027	5.00	4.50
2028	4.75	4.50
2029 +	4.50	4.50

The trend assumption has not been changed since the previous valuation. The initial trend assumption is consistent with recent healthcare trend survey assumptions for PPO type non-Medicare coverage, and supplement with drug coverage for Medicare retirees. On a longer term basis, trend is assumed to reach an ultimate level of 4.5% consisting of 3.0% CPI, plus 1.0% real GDP plus 0.5% technology. These real trend components are consistent with long term trend analysis published by CMS.

Amortization period: Open basis, thirty-year amortization with payments increasing by 5% annually, as is consistent with statutory guidelines regarding amortization of pension liabilities. Under this amortization methodology, the Unfunded Actuarial Accrued Liability is not expected to be fully amortized, even if the full Annual Required Contribution was contributed to the plan. We are not opining on the reasonableness of a 5% salary growth assumption for use under GASB 43 and 45.

Coverage: It is assumed that 80% of current active employees will elect retiree medical coverage. It is assumed that 70% of terminated vested participants will elect medical coverage when they start receiving pension benefits. It is assumed that deferred pension benefits will commence at age 50 for Group C and age 55 for Group F and Defined Contribution Plan participants. This assumption remains unchanged from our previous valuation, and was validated by examining actual experience from fiscal years 2012, 2013 and 2014, tempered with actuarial judgement.

Administrative expenses: No provision made beyond healthcare administration; expenses of the System are paid by the State.

Medical plan costs: Estimated gross per capita incurred claim costs for 2015-16 at age 64 and 65 for male participants were $18,063 and $3,297, respectively. The age 65 cost represents $1,614 for medical and $1,683 for prescription drugs. Per capita claims costs at other ages reflect estimated underlying costs based on Morbidity. It is assumed that future retirees are Medicare eligible at age 65.

Per capita costs were developed from the monthly premium equivalents calculated by the State and are assumed to include administrative costs. The premiums for the separate options were weighted by actual retiree and dependent enrollment (separately under and over age 65). Per capita costs for pre-65 coverage were based on premium amounts including the premium amounts for covered children. The weighted average premiums were age adjusted based on retiree enrollment only for pre-Medicare costs and retiree and spouse enrollment for post-Medicare costs, using an age/sex distribution of retirees (and Medicare-eligible spouses) separated by pre and post age 65. Pre-65 retirees were blended with an age/sex distribution of active employees. The age/sex adjustment was not used on the increased amount for the coverage of children of the retiree.

The valuation relies on the accuracy of the premium equivalents which are assumed to be suitable for this purpose. The use of these premium equivalents rather than development of per capita could produce results that differ from those shown in this valuation, but we would not anticipate that claims based results would differ materially from those included in this valuation. The plans are self-insured.

Retiree Contribution Basis:

Retiree contributions are valued with a weighted-average premium. This weighted-average premium is based on the medical plan coverage of current retirees, and varies for pre-65 and Medicare-eligible coverage. Contributions for children are included in the weighted average pre-65 rates.

Premium Reduction Option:

It is assumed that 35% of future retiree covering spouses will elect the Premium Reduction Option at retirement. The Option is valued using a reduction factor of 94.82% of the single-life subsidy for which the retiree and spouse are eligible, which is based on premium information provided by VSTRS. These assumptions are based on current retiree elections. Current retirees and surviving spouses are valued according to their actual PRO election as provided by State personnel.

This assumption has been updated since the prior valuation, which assumed 50% of current and future retirees covering spouses will elect the Option and assumed all surviving spouses with date of retirement before January 1, 2007 paid the full medical premium. The revised assumption was developed by examining actual election percentages based on the 2015 census, tempered with actuarial judgement.

Age-Based Morbidity:

An age morbidity curve developed based on a study performed by Dale Yamamoto for the Society of Actuaries was used to measure the annual increases in per capita claim costs for each age as well as relative cost by gender, adjusting the male age 65 per capita claims cost[1]. Pre-65 age-based morbidity factors were applied to pre-65 medical and prescription drug costs, and separate Medicare medical and Rx morbidity factors were applied to Medicare-eligible medical costs and prescription drug costs, respectively. Please see Appendix A for the full table of factors used.

This assumption has been updated since the prior valuation, which used a different age morbidity curve and assumed the prescription drug costs do not increase with age above age 65.

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[1] **Health Care Costs—From Birth to Death**, prepared by Dale H. Yamamoto, http://www.healthcostinstitute.org/files/Age-Curve-Study_0.pdf. Retrieved July 15, 2013. The Study was sponsored by the Society of Actuaries and is part of the Health Care Cost Institute's Independent Report Series.

Separations from service:

Representative values of the assumed annual rates of withdrawal, vested retirement, disability and death are as follows. Mortality rates are identical to those used for retirees, as described under *Deaths after retirement* in this section. All disabilities are assumed to be ordinary.

These assumptions have been updated since the prior valuation, and are based on the results of the experience study presented and approved by the Board in 2015. Please note DC employees were not included in the experience study; their decrement assumptions are assumed to be consistent with those for Group F.

Termination – Group C*		
Svc	Male	Female
0	14.40%	28.80%
1	8.64%	17.28%
2	7.20%	14.40%
3-5	4.61%	9.22%
6-19	4.32%	8.64%
>=20	0.00%	0.00%

* No termination assumed after age 35 for Group C

Termination – Non Group C*		
Age	A, D	F, DC
25	4.91%	4.91%
30	3.93%	3.93%
35	3.28%	3.28%
40	3.04%	3.04%
45	2.69%	2.69%
50	2.25%	2.25%
55	1.83%	0.00%
59	3.92%	0.00%
60	3.90%	0.00%
61	3.89%	0.00%

* Increased during first 10 years of service.

Disability		
Age	A, D, F, DC	C
25	0.02%	0.08%
30	0.02%	0.10%
35	0.03%	0.13%
40	0.04%	0.20%
45	0.06%	0.32%
50	0.11%	0.55%
55	0.18%	0.91%
59	0.26%	1.33%
60	0.28%	1.46%
61	0.31%	1.60%

Early and normal retirement rates:

All members in Group A, C, and D are assumed to retire when first eligible.

These assumptions have been updated since the prior valuation, and are based on the results of the experience study presented and approved by the Board in 2015

Retirement - Group F / DC		
Age	**Male**	**Female**
49	0.0%	6.0%
50	16.0%	6.0%
51	16.0%	8.0%
52	8.0%	9.0%
53	8.0%	9.0%
54	8.0%	10.0%
55	4.0%	5.0%
56	3.4%	4.2%
57	4.5%	5.6%
58	5.0%	6.3%
59	5.6%	5.6%
60	5.6%	5.6%
61	11.2%	11.2%
62	22.4%	22.4%
63	17.5%	14.0%
64	17.5%	14.0%
65	25.0%	20.0%
66	15.0%	15.0%
67	17.5%	17.5%
68	17.5%	17.5%
69	20.0%	20.0%
70	100.0%	100.0%

Deaths after retirement:

These assumptions have been updated since the prior valuation, and are based on the results of the experience study presented and approved by the Board in 2015

Service Retirees and Beneficiaries:

Group C: The RP-2000 Mortality Tables for Healthy Annuitants with Blue Collar Adjustment with mortality improvements projected to 2025 with Scale BB.

Group D: The RP-2000 Mortality Tables for Healthy Annuitants with mortality improvements projected to 2025 with Scale BB.

Group A, F, and Defined Contribution: The RP-2000 Mortality Tables for Healthy Annuitants, weighted by 30% with Blue Collar Adjustments and 70% without, with mortality improvements projected to 2025 with Scale BB.

Disabled Retirees (All Groups): The RP-2000 Mortality Tables for Healthy Annuitants for retirees and beneficiaries with a five-year set-forward, with mortality improvements projected to 2025 with Scale BB.

Spouse's age:

For current retirees, actual spouse dates of birth are used when available. Husbands are assumed to be 3 years older than their wives for future retirees and any current spouses for whom this information was not available Any dependents age 26 and under were assumed to be children and were not explicitly valued. This assumption remains unchanged from our previous valuation, and was validated by examining actual retiree 2015 census, tempered with actuarial judgement.

Covered spouses:

60% of male future retirees and 50% of female future retirees are assumed to be covering spouses. This assumption is based on analysis of the past 3 years of VSERS experience, tempered with actuarial judgement.

This assumption has been updated since the previous valuation, which assumed 75.4% (71.4% for Group F and Defined Contribution) of male members and 64.0% (63.1% for Group F and Defined Contribution) of female members are assumed to be covering spouses.
These assumptions have been updated since the prior valuation, and are based on the results of the experience study presented and approved by the Board in 2015

Section VII – Consideration of Health Care Reform and Subsequent Events

Summary of Effects of Selected Provisions

Removal of Lifetime Maximum – We expected that the elimination of the lifetime maximums as of January 1, 2011 would have had a negligible impact on the retiree health plan obligations since the plans had relatively high lifetime maximums of $2 million. We assume that any impact has now been reflected in the plan premium equivalents developed by the State.

Medicare Advantage Plans - Effective 1/1/2011: The law provides for reductions to the amounts that would be provided to Medicare Advantage plans starting in 2011. As the State does not provide these plans to retirees, there is no impact.

Expansion of Child Coverage to Age 26: We assume that the effect of this provision was reflected in the 2012 plan premium equivalents developed by the State and in the enrollment information since then; therefore, any impact is already being recognized in the assumed per capita costs.

Medicare Part D Subsidy - Shrinking Medicare Prescription Drug "Donut Hole"- Starting 1/1/2011– Medicare Part D Retiree Drug Subsidy ("RDS") payments has not been reflected as on ongoing offsetting item in GASB 45 valuations, and so no direct impact on the RDS has been reflected. It is our understanding that Medicare prescription drug benefits are offered through an Employer Group Waiver Plan (EGWP) effective January 1, 2015. Therefore, VSERS will no longer seek reimbursement for the Retiree Drug Subsidy. The impact of the shrinking Medicare prescription drug benefit donut hole coverage gap on EGWP financing was considered in setting the trend assumption for this valuation. Because the improved coverage gap benefit results in lower reinsurance in the catastrophic layer of federal payments, no long term trend impact was assumed. The 4.25% discount rate assumed in valuations prior to June 30, 2014 was predicated on the commitment to continue to contribute the RDS amount into the plan. The discount rate was lowered to 4.00% for the 2014 valuation to reflect that there is currently no plan to contribute additional funds to the plan, and remains at that level for this valuation. The benefits provided to Medicare eligible Vermont retirees under this plan have enough subsidy provided by the plan that we do not anticipate that plan participation will be affected as the competing Part D benefits are improved.

Excise Tax on High-Cost Employer Health Plans (aka Cadillac Tax) - Effective 1/1/2018 - There is considerable uncertainty about how the tax would be applied, and considerable latitude in grouping of participants for tax measurement testing purposes. We prepared a projection of the calculation based on a reasonable interpretation of the applicable legislation. The projection separately valued single and family premium costs for participants over age 65 from the premium costs for pre-65 participants, projecting these amounts by the medical cost increase factors in this valuation. The initial 2018 limits for calculating the tax were projected using the same cost increase factors as used for the valuation. The limits after 2018 were calculated using an assumed CPI of 3.0%. We adjusted healthcare cost trend to reflect the Tax. This increased overall results by about 1.4%.

Green Mountain Care: Vermont had proposed a single payer system to be established as the means of implementing health care reform. Within the past year, the Governor's office announced that it would not be going ahead with the arrangement due to expected costs of the arrangement[1].

[1] See for example https://www.bostonglobe.com/business/2015/01/25/costs-derail-vermont-single-payer-health-plan/VTAEZFGpWvTen0QFahW0pO/story.html.

Other: We have not identified any other specific provision of national health care reform that would be expected to have a significant impact on the measured obligation. As additional guidance on both the federal and Vermont legislation is issued, we will continue to monitor any potential impacts.

Subsequent Events

GASB has recently announced the adoption of two new accounting standards for OPEB, GASB Statement No. 74, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans* (GASB 74) and GASB Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions (GASB 75)*. The provisions of GASB 74 are effective for the reporting of the Plan for fiscal years beginning after June 15, 2016. The provisions of GASB 75 related to employer accounting, are effective for fiscal years beginning after June 15, 2017. We have not yet evaluated the impact of these new rules on the accounting for the health benefits offered by the System.

Section VIII – Postretirement Benefit Plan Provisions

Retiree Medical Benefits

ELIGIBILITY AND PREMIUM SUBSIDY

Retiree Coverage and Subsidy Level

Group A:

Retirement	Earlier of (a) age 55 with 5 years of service or (b) 30 years of service: 80% Subsidy

Group C:

Retirement	Earlier of (a) age 55, (b) age 50 with 20 years of service, or (c) 30 years of service: 80% Subsidy
Termination	Participants who terminate with 20 or more years of service may begin medical benefits upon commencement of retirement benefits: 80% Subsidy.

Group D:

Retirement	Age 55 with 5 years of service: 80% Subsidy

Group F and Defined Contribution:

Retirement

Earlier of (a) age 55 with 5 years of service or (b) 30 years of service

Hired prior to July 1, 2008 - 80% Subsidy

Hired on or after July 1, 2008

Less than 10 years:	0% Subsidy
10-14 years:	40% Subsidy
15-19 years:	60% Subsidy
20 years or more:	80% Subsidy

Termination

Participants who are first included in the membership on or after July 1, 2008 who terminate with 20 or more years of service may begin medical benefits upon commencement of retirement benefits: 80% Subsidy.

RETIREE CONTRIBUTIONS

Retirees must pay all premium costs in excess of the VSERS subsidy. The VSERS subsidy is equal to the retiree's subsidy percentage applied to the plan premium according to the plan and tier elected.

Premium Reduction Option: For retirements on or after January 1, 2007, members entitled to a VSERS premium subsidy have a one-time option to reduce the percentage of VSERS subsidy during the retiree's life, with the provision that a surviving spouse will continue to receive the same VSERS subsidy for his or her lifetime. The reduction in VSERS subsidy is intended to result in an actuarially equivalent benefit.

BENEFIT DURATION

Lifetime for retirees. Spouses of retirees who elect the joint and survivor pension option may continue coverage for their lifetimes but must pay 100% of the plan premium (unless PRO option is elected).

State of Vermont Employee Medical Plan Options for Retirees Effective January 1, 2015

<table>
<tr><th rowspan="2">Benefit/Feature</th><th rowspan="2">TotalChoice Plan</th><th colspan="2">SelectCare POS Plan</th></tr>
<tr><th>In-Network</th><th>Out-of-Network</th></tr>
<tr><td>Annual DEDUCTIBLE</td><td>$300 per person;
$600 per family</td><td>none</td><td>$500 per person;
$1,000 per family</td></tr>
<tr><td>MAXIMUM annual COPAYS
(after deductible is met)</td><td>$750 per person;
$2,250 per family</td><td>none</td><td>$2,000 per person;
$6,000 per family</td></tr>
<tr><td>Maximum Lifetime Benefit Per Member</td><td>none</td><td>none</td><td>none</td></tr>
<tr><td>Inpatient Hospital</td><td>90%</td><td>100% after $250 co-pay</td><td>70%</td></tr>
<tr><td>Outpatient Hospital</td><td>80%</td><td>100%</td><td>70%</td></tr>
<tr><td>Emergency Room</td><td>80%</td><td>100% after $50 co-pay
(waived if admitted)</td><td>70%</td></tr>
<tr><td>Physician Charges
• Office visit
• Surgery
• In-Hospital visit</td><td>
80%
90% inpatient; 80% outpatient
90%</td><td>
100% after $20 copay
100%
100%</td><td>
70%
70%
70%</td></tr>
<tr><td>Diagnostic X-ray and Labs</td><td>80%</td><td>100%</td><td>70%</td></tr>
<tr><td>Home Healthcare</td><td>80%</td><td>100%</td><td>70%</td></tr>
</table>

<table>
<tr><th colspan="2">COMMON BENEFITS IN ALL PLAN OPTIONS</th></tr>
<tr><td>Preventive Exams & Tests- Program Benefits</td><td>Covered at 100%</td></tr>
<tr><td>Wellness Program Benefits</td><td>Available to all active employees and retirees in any of the three health plan options, at no charge to the employee or retiree.</td></tr>
<tr><th colspan="2">COMMON BENEFITS IN ALL PLAN OPTIONS</th></tr>
<tr><td>Mental Health & Substance Abuse Program Benefits</td><td>In-Network: Paid at 100%. Out-of-Network: deductibles & copay required.</td></tr>
<tr><td>Prescription Drugs
• Retail
• Mail</td><td>This is a prescription drug card plan, which combines both local retail and mail order drugs. There is an annual $25 per person/$75 family deductible. Individual pays 10% copay for generic drugs, 20% copay for preferred brand drugs, and 40% copay for non-preferred brand drugs. 40% copay drugs will not be counted toward the maximum out-of-pocket limit, except for Specialty drugs. Maximum out-of-pocket is $775 per covered member per year for both retail and mail order including the deductible.</td></tr>
<tr><td>Routine Vision Care</td><td>The plan pays $100 every two years, with no deductible and coinsurance, or copay. Benefits available for every plan member, including dependents. Covers routine exams and/or lens changes.</td></tr>
</table>

Section IX – Glossary of Terms

Actuarial accrued liability
That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of OPEB benefits and expenses which is not provided for by future Normal Costs and therefore is the value of benefits already earned.

Actuarial assumptions
Assumptions as to the occurrence of future events affecting OPEB costs, such as: mortality, withdrawal, disablement and retirement; changes in compensation and Government provided OPEB benefits; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; characteristics of future entrants for Open Group Actuarial Cost Methods; and other relevant items.

Actuarial cost method
A procedure for determining the Actuarial Present Value of OPEB benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Accrued Liability.

Actuarial experience gain or loss
A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Amortization (of unfunded actuarial accrued liability)
That portion of the OPEB plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability or the Unfunded Frozen Actuarial Accrued Liability.

Annual OPEB cost
An accrual-basis measure of the periodic cost of an employer's participation in a defined benefit OPEB plan.

Annual required contributions of the employer (ARC)
The employer's periodic expense to a defined benefit OPEB plan, calculated in accordance with the parameters. It is the value of the cash contributions for a funded plan and the starting point in the calculations of the expense entry in the profit and loss section of the financial statements.

Closed amortization period (closed basis)
A specific number of years that is counted from one date and, therefore, declines to zero with the passage of time. For example, if the amortization period initially is thirty years on a closed basis, twenty-nine years remain after the first year, twenty-eight years after the second year, and so forth. In contrast, an open amortization period (open basis) is one that begins again or is recalculated at each actuarial valuation date. Within a maximum number of years specified by law or policy (for example, thirty years), the period may increase, decrease, or remain stable.

Covered payroll
Annual compensation paid to active employees covered by an OPEB plan. If employees also are covered by a pension plan, the covered payroll should include all elements included in compensation on which contributions to the pension plan are based. For example, if pension contributions are calculated on base pay including overtime, covered payroll includes overtime compensation.

Defined benefit OPEB plan
An OPEB plan having terms that specify the benefits to be provided at or after separation from employment. The benefits may be specified in dollars (for example, a flat dollar payment or an amount based on one or more factors such as age, years of service, and compensation), or as a type or level of coverage (for example, prescription drugs or a percentage of healthcare insurance premiums).

Funded ratio
The actuarial value of assets expressed as a percentage of the actuarial accrued liability.

Funding policy
The program for the amounts and timing of contributions to be made by plan members, employer(s), and other contributing entities (for example, state government contributions to a local government plan) to provide the benefits specified by an OPEB plan.

Healthcare cost trend rate
The rate of change in per capita health claims costs over time as a result of factors such as medical inflation, utilization of healthcare services, plan design, and technological developments.

Investment return assumption (discount rate)
The rate used to adjust a series of future payments to reflect the time value of money.

Level dollar amortization method
The amount to be amortized is divided into equal dollar amounts to be paid over a given number of years; part of each payment is interest and part is principal (similar to a mortgage payment on a building). Because payroll can be expected to increase as a result of inflation, level dollar payments generally represent a decreasing percentage of payroll; in dollars adjusted for inflation, the payments can be expected to decrease over time.

Level percentage of projected payroll amortization method
Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years. The dollar amount of the payments generally will increase over time as payroll increases due to inflation; in dollars adjusted for inflation, the payments can be expected to remain level.

Net OPEB obligation (NOO)
The cumulative difference since the effective date of GASB 45 between annual OPEB cost and the employer's contributions to the plan, including the OPEB liability (asset) at transition, if any, and excluding (a) short-term differences and (b) unpaid contributions that have been converted to OPEB-related debt. It will be included as a balance sheet entry on the financial statements.

Normal cost
That portion of the Actuarial Present Value of OPEB benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. It is the value of benefits to be accrued in the valuation year by active employees.

OPEB-related debt
All long-term liabilities of an employer to an OPEB plan, the payment of which is not included in the annual required contributions of a sole or agent employer (ARC) or the actuarially determined required contributions of a cost-sharing employer. Payments generally are made in accordance with installment contracts that usually include interest. Examples include contractually deferred contributions and amounts assessed to an employer upon joining a multiple-employer plan.

Other postemployment benefits
Postemployment benefits other than pension benefits. Other postemployment benefits (OPEB) include postemployment healthcare benefits, regardless of the type of plan that provides them, and all postemployment benefits provided separately from a pension plan, excluding benefits defined as termination offers and benefits.

Pay-as-you-go
A method of financing a OPEB plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

Required supplementary information (RSI)
Schedules, statistical data, and other information that are an essential part of financial reporting and should be presented with, but are not part of, the basic financial statements of a governmental entity.

Appendix A – Yamamoto Age Morbidity Table

Gender distinct age morbidity factors for pre-Medicare morbidity were developed from "Health Care Costs—From Birth to Death" sponsored by the Society of Actuaries and prepared by Dale H. Yamamoto (May 2013) (Chart 5). Table 4 from Mr. Yamamoto's study formed the basis of Medicare morbidity factors that are gender distinct and differ for prescription and non-prescription coverages. Non-prescription morbidity factors assumed a cost allocation of 50% for inpatient, 25% for outpatient, and 25% for professional services. Adjustments were made to Table 4 factors for inpatient costs at age 70 and below to smooth out what appears to be a spike in utilization for Medicare retirees gaining healthcare for the first time through Medicare. While such retirees were included in the study, their specific experience is not applicable for a valuation of an employer retiree medical plan where participants had group active coverage before retirement.

Age	Male	Female
50	0.4612	0.5736
51	0.4884	0.5930
52	0.5194	0.6124
53	0.5465	0.6318
54	0.5775	0.6512
55	0.6085	0.6667
56	0.6434	0.6860
57	0.6744	0.7054
58	0.7093	0.7287
59	0.7481	0.7519
60	0.7829	0.7791
61	0.8217	0.8101
62	0.8643	0.8450
63	0.9070	0.8798
64	0.9535	0.9186

Age	NonRx Male	NonRx Female	Rx Male	Rx Female
65	1.0000	0.8862	1.0000	0.9884
66	1.0125	0.8912	1.0720	1.0591
67	1.0252	0.8962	1.1350	1.1208
68	1.0376	0.9012	1.1915	1.1761
69	1.0501	0.9067	1.2404	1.2224
70	1.0623	0.9120	1.2841	1.2622
71	1.0612	0.9175	1.3213	1.2943
72	1.0642	0.9275	1.3522	1.3226
73	1.0711	0.9399	1.3779	1.3445
74	1.0805	0.9543	1.3997	1.3638
75	1.0911	0.9707	1.4177	1.3792
76	1.1030	0.9881	1.4319	1.3920
77	1.1174	1.0083	1.4447	1.3997
78	1.1340	1.0318	1.4550	1.4062
79	1.1544	1.0587	1.4614	1.4100
80	1.1788	1.0900	1.4614	1.4087
81	1.2065	1.1248	1.4550	1.4036
82	1.2378	1.1633	1.4396	1.3933
83	1.2710	1.2037	1.4165	1.3792
84	1.3061	1.2447	1.3869	1.3625
85	1.3424	1.2851	1.3522	1.3419
86	1.3795	1.3255	1.3149	1.3188
87	1.4160	1.3651	1.2763	1.2943
88	1.4517	1.4030	1.2404	1.2699
89	1.4863	1.4376	1.2044	1.2468
90	1.5190	1.4680	1.1722	1.2237
91	1.5500	1.4916	1.1414	1.2018
92	1.5793	1.5060	1.1118	1.1812
93	1.6059	1.5087	1.0861	1.1620
94	1.6302	1.4985	1.0604	1.1427
95	1.6518	1.4727	1.0360	1.1247
96	1.6692	1.4301	1.0141	1.1080
97	1.6839	1.3709	0.9923	1.0913
98	1.6944	1.2937	0.9730	1.0746