2017 SEBAC AGREEMENT

Contents:

Source of SEBAC Agreement Savings Estimates

Wage Estimates were developed by OPM:

- Elimination of potential FY 2017, 2018, and 2019 increases: Removes all of the proposed RSA increase in the Governor's recommended budget: $300.6 million in FY18 and $486.2 million in FY 2019.
- Deferral of April 2018 longevity payment to FY 2019: Based on April 2017 longevity payments, this is projected to result in a shift of $11.0 million from FY 2018 to FY 2019.
- One-time FY 2019 payment. Estimated based on approximately 42,000 filled FTE employees X 2,000 = $84.0 million. Provision to pay lump sum at maximum + $1,000 in lieu of the $2,000 is estimated to add $4.4 million based on a review of employees eligible for the additional payment. Total impact is +$88.4 million.
- 3 Furlough days in FY 2018 at $12 million per day equals $36.0 million in FY 2018 savings.

Active and Retiree Healthcare Projections were based on data received from The Office of the State Comptroller or their healthcare consultant: Segal Consulting.

Pension Estimates for SERS were based on projections received from the State's pension actuary: Cavanaugh-Mcdonald Consulting, LLC. Estimates for the Higher education alternate retirement program were developed by OPM.

Attrition savings estimate developed by OPM, based on retirement projections developed by Cavanaugh Mcdonald and assuming that 1/3rd of FY 2018 retirements and 1/10th of FY 2019 retirements will remain permanently unfilled.

	Impact by FY:																			
	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037
Wages																				
FY 17, 18, and 19 zeros	300.6	468.2	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6
3 Unpaid Days in FY18	36.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
April 2018 Longevity Delay	11.0	(11.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$2K payment / $1K + top-step in FY19	-	(88.4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Active Healthcare																				
Financial Incentive to utilize urgent care over ER	13.3	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
Full utilization management on PT / OT services	2.7	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.2	4.4	4.6	4.7	4.9	5.1	5.3	5.5	5.8	6.0	6.2	6.5
PCP and specialist tiering based on quality and cost for PCP specialties	(1.1)	(1.3)	(1.4)	(1.4)	(1.5)	(1.5)	(1.6)	(1.6)	(1.7)	(1.8)	(1.9)	(1.9)	(2.0)	(2.1)	(2.2)	(2.3)	(2.3)	(2.4)	(2.5)	(2.6)
PCP and specialist tiering based on quality and cost for non-PCP specialties	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Site of service: Diagnostic X-rays, high-cost imaging and labs	6.3	7.5	7.8	8.1	8.4	8.8	9.1	9.5	9.9	10.3	10.7	11.1	11.5	12.0	12.5	13.0	13.5	14.0	14.6	15.2
Member incentive based program (SmartShopper)	2.8	3.7	3.8	4.0	4.2	4.3	4.5	4.7	4.9	5.1	5.3	5.5	5.7	5.9	6.2	6.4	6.7	6.9	7.2	7.5
Increased co-pays for non-HEP drugs	7.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Adopting the CVS standard formulary	25.4	27.0	28.1	29.2	30.4	31.6	32.9	34.2	35.6	37.0	38.5	40.0	41.6	43.3	45.0	46.8	48.7	50.6	52.6	54.7
Improved pricing in 2018 RFP due to Medicare Advantage pricing improvements	-	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Implementation cost	(0.1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Premium Cost Sharing (1%/1%/1% starting 7/1/19 ; new hires = 3% now)	-	-	5.6	11.2	16.8	17.5	18.2	18.9	19.7	20.4	21.3	22.1	23.0	23.9	24.9	25.9	26.9	28.0	29.1	30.3
Retiree Healthcare																				
Medicare Advantage	63.3	130.5	135.7	141.1	146.8	152.7	158.8	165.1	171.7	178.6	185.7	193.2	200.9	208.9	217.3	226.0	235.0	244.4	254.2	264.4
Misc. pre-65 benefit changes	1.4	3.9	5.9	7.9	9.0	9.4	9.7	10.1	10.5	10.9	11.4	11.8	12.3	12.8	13.3	13.9	14.4	15.0	15.6	16.2
Medicare Part B changes	-	-	-	-	1.6	3.2	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
Retiree Cost Sharing (+1.5% eff. 7/1/17, +3.5% eff. 7/1/22)	0.3	0.6	0.9	1.2	1.5	2.2	2.9	3.6	4.3	5.0	5.7	6.4	7.1	7.8	8.5	9.2	9.9	10.6	11.3	12.0
Pensions																				
SEBAC Wage Freeze, COLA Holiday, COLA Formula, Contributions & Tier 4	205.3	233.5	258.8	263.5	282.9	300.0	305.3	311.6	318.7	326.1	333.7	341.9	350.0	359.0	368.7	379.0	390.0	401.7	414.2	426.9
Judicial Marshals	-	-	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)	(1.0)
ARP Changes	5.0	5.0	7.0	7.5	7.9	8.3	8.8	9.3	9.8	10.3	10.8	11.3	11.8	12.4	13.0	13.5	14.1	14.7	15.4	16.0
Additional Items																				
Tuition & Reimbursements	(2.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Attrition	23.1	53.6	63.2	65.4	67.1	68.7	70.5	72.2	74.0	75.9	77.8	79.7	81.7	83.8	85.9	88.0	90.2	92.5	94.8	97.1
Total	700.9	868.6	1,042.0	1,064.4	1,101.9	1,132.1	1,150.9	1,169.5	1,189.4	1,210.1	1,231.5	1,253.8	1,276.6	1,300.9	1,326.4	1,353.0	1,380.9	1,410.1	1,440.8	1,472.2
Cumulative Total:	700.9	1,569.5	2,611.5	3,675.9	4,777.8	5,909.9	7,060.9	8,230.4	9,419.9	10,630.0	11,861.4	13,115.3	14,391.9	15,692.8	17,019.2	18,372.1	19,753.0	21,163.1	22,603.9	24,076.1

Anthem Estimate

State of CT

Requested Medical Benefit Changes and Estimated Savings

6/5/2017

Benefit Description	Current Benefit	Proposed Benefit	Assumptions	Estimated Savings- FY 18				Estimated Savings- FY 19				Date to Operational (Year 1)[3]
				Gross Savings - Anthem Only	Gross Savings Total Population/(cost)	Gross SavingsTotal Population/(cost) - Less Employee Share	*GF Savings/ (cost)*	Gross Savings - Anthem Only	Gross Savings Total Population/(cost)	Gross Savings Total Population/(cost) - Less Employee Share	*GF Savings/ (cost)*	
Create financial incentive to utilize urgent care over ER	Urgent/Emergency Room: Actives: $15/$35 copay Pre 1999 retirees: $5	**$250 copay** $15 copay for Urgent Care $5 copay for Live Health Online	–Mandatory change –57% of ER visit = potentially avoidable –10% shift to UC –Limited shift to LHOL –Non shifting population incurs higher cost share	**$16,000,000**	**$18,518,519**	**$15,935,185**	***$12,111,111.11***	**$16,000,000**	**$18,518,519**	**$15,935,185**	***$12,111,111***	First of the month following 45 day notice from the State. For example, if Anthem receives notice on June 29, 2017, Anthem can implement this benefit change on September 1, 2017.
Implement full utilization management on Physical Therapy/Occupational Therapy (PT/OT) services (Orthonet) (**based upon medical necessity criteria**)	Covered 100% with unique arrangement through OrthoNet **(Consultative Only)**	Utilization Management PT/OT medical necessity review Covered 100%	– Same benefit structure – Same utilization in future period – Analysis excludes cases for single evaluation sessions	**$3,220,000**	**$3,726,852**	**$3,206,956**	***$2,437,361.11***	**$3,220,000**	**$3,726,852**	**$3,206,956**	***$2,437,361***	First of the month following 45 day notice from the State. See above example.
PCP & Specialist Tiering based on Quality & Cost Unique State built Tiered PCP & Specialty network where cost and quality determine the tier. The following **PCP Specialties** can be tiered: • Advanced Practice Nurse • Family practice • General practitioner • Internal Medicine • Pediatrics	$15 Copay	PCP Tiering: – Tier 1 (cost/quality): $0 copay – Tier 2 (cost/quality): $15 copay	–PCPs: ● Baseline Tier 1 Percentage: 76% of episodes ● Baseline Tier 2 Percentage: 24% of episodes Shift between Tier 1 and Tier 2 is estimated at 15% but cost savings is offset by reduced member liability, resulting in a negative benefit.	**($1,300,000)**	**($1,504,630)**	**($1,294,734)**	***($984,027.78)***	**($1,300,000)**	**($1,504,630)**	**($1,294,734)**	***($984,028)***	First of the month following 45 day notice from the State. See above example.
PCP & Specialist Tiering based on Quality & Cost Unique State built Tiered PCP & Specialty network where cost and quality determine the tier. The following **non-PCP Specialties** can be tiered: • Allergy & Immunology • Cardiology • Endocrinology • ENT • Gastroenterology • OBGYN • Ophthalmology • Ortho/Surgery • Rheumatology • Urology	$15 Copay	Specialist Tiering: – Tier 1 (cost/quality): $0 copay – Tier 2 (cost/quality): $15 copay	Baseline Tier 1 Percentage: 61.5% Baseline Tier 2 Percentage: 38.5% Percent of Tier 2 Projected to Shift: 15%	**$200,000**	**$231,481**	**$199,190**	***$151,388.89***	**$200,000**	**$231,481**		***$151,389***	First of the month following 45 day notice from the State. See above example.
Site of Service: Diagnostic X-ray, High Cost Imaging and Lab	100% - $0 copay	● 100% coverage for designed reference labs, diagnostic X-ray centers and high cost imaging ● 80% coverage for other In-network labs, diagnostic X-ray centers and high cost imaging ● 60% out of network	– Benefit will have member cost savings depending on the Site of Service where certain lab and x-ray services are performed. – Lab services performed at an independent lab and designated freestanding are covered at 100%. – Services performed at an outpatient hospital facility or out-of-network have higher cost-shares. – Projected shift: 30%	**$7,500,000**	**$8,680,556**	**$7,469,618**	***$5,677,083.33***	**$7,500,000**	**$8,680,556**	**$7,469,618**	***$5,677,083***	First of the month following 45 day notice from the State. See above example.
Member incentive based program (SmartShopper) for the following services: • Colonoscopy • Hip Surgery • Knee Surgery • Knee Replacement • Spinal Surgery • Shoulder Surgery • Hysterectomy/Hysteroscopy • Sigmoidoscopy • Upper GI	N/A	**Benefit incentive linked to procedures and physicians	– 20% redirection. Assumes active employer engagement with member communication plan – Program incentives and savings per procedure are outlined on Attachment A – Savings are net of member incentives and administrative fees. Administrative fees equal to a percentage of the savings. - Actual active/<65 retiree split not yet available so savings based on an assumption that total dollars are split 70% active and 30% <65 retirees. **(Savings estimate to be adjusted when actual split available.)**	**$3,698,978**	**$4,281,225**	**$3,683,994**	***$2,799,920.85***	**$3,698,978**	**$4,281,225**	**$3,683,994**	***$2,799,921***	First of the month following 90 day notice from the State.
Increased co-pays for non-HEP drugs	co-pays are $5, $20, $35 for retail acute drugs and $5, $10, $25 for non-HEP Maintenance drugs	Increase Co-pays for all Non-HEP drugs to: $5 Gen Tier 1, $10 Gen Tier 2, $25 Preffered, $40 Non-preffered -	Assumes generic tiering threshold set at $50	**na**	**$10,500,000**	**$9,035,250**	***$6,867,000.00***	**$0**	**$10,500,000**	**$9,035,250**	***$6,867,000***	45 day notice
Adopting the CVS Standard Formulary	Open formulary	Adoption of the CVS standard formulary with modifications to the appeal process		**na**	**$35,500,000**	**$30,547,750**	***$23,217,000.00***		**$35,500,000**	**$30,547,750**	***$23,217,000***	45 day notice
Not a benefit change	Not a benefit change	Not a benefit change	Assumed better improved pricing in 2018 resulting from going to RFP for the Active and Pre-65 Retiree population. Savings based upon proposed pricing improvements provided by CVS as a result of Medicare Advantage RFP.	**na**	**na**	**na**	***na***	**na**	**$14,000,000**	**$12,047,000**	***$9,156,000***	July 1st 2018
Total Savings[1]				**na**	**$79,934,002**	**$68,783,209**	***$52,276,837.51***		**$93,934,002**	**$80,631,019**	***$61,432,838***	
Estimated Anthem Implementation Costs[2]					**($150,000)**	**($129,075)**	***($98,100.00)***		**$0**	**$0**	***$0***	
Estimated Net Savings				**na**	**$79,784,002**	**$68,654,134**	***$52,178,737.51***		**$93,934,002**	**$80,631,019**	***$61,432,838***	

Anthem Notes:
1. Estimated savings are based on the pre-implementation baseline period. Year 2 estimated savings are not incremental to the year 1 savings. Please note that the savings are based on the number of covered lives. If the number of covered lives fluctuates (e.g., the State reduces its work force or the number of under 65 retirees aging out into Medicare exceeds the number of new under 65 retirees) the savings would be different.
2. With the exception of SmartShopperand Orthonet, current estimated Anthem implementation costs are $150,000 for both actives and retirees and apply in year 1 only. Costs to the State will be a direct pass through subject to a cap of $300,000. The State will pay the lesser of Anthem's actual costs or $300,000. Anthem will invoice the State monthly. For SmartShopper, administrative costs apply in all years of the contract and will be based on a percentage of the savings. The estimated savings for SmartShopper are net of these costs so no additional costs are shown. Program savings are based on the level of member communication, education, and engagement. For Orthonet, the administrative costs are $0.28 pmpm in year 1 and year 2and the savings quoted is net of this expense. This pmpm will be added to the Anthem admin fee. The estimated savings for Orthonet are net of these costs so no additional costs are shown.
3. Anthem can implement all benefits except SmartShopper as of the first of the month following 45 day notice from the State. For example, if Anthem receives notice on June 29, 2017, Anthem can implement this benefit change on September 1, 2017. This timeline assumes the benefits as presented by Anthem to the State. Additional time may be required if the State makes any changes to the benefits (e.g., in connection with the tiered benefit, the State requests modification to the listing of PCPs or Specialists contained in Tier 1).
4. All savings assume 12 months of savings and woudl require adjustment for any mid fiscal year implmentation.

Calculation Notes:
1. The savings estimates provided by Anthem for the proposed benefit changes to the medical plan have been reviewed by the Segal and determined to be reasonable.
2. The savings estimates provided by Anthem are included in the "Gross Savings - Anthem Only" column and include only the impact on the Anthem population. The savings are adjusted to incorporate the impact of applying the changes to the Oxford population in the "Gross Savings Total Population Column".
3. Savings are then adjusted to reflect the amount of the savings that will accrue the General Fund by multiplying the "Gross Svigns total Population" calculation by 65.4%.
4. Pharmacy copay savings were provided by Segal and represent the aggregate savings for the Active population (Anthem and Oxford). The copay savings assume a differential in generic copays set at a threshold of $50.
5. The savings associated witht he adoption of the standard fromulary was calculated by Segal. The gross savings calculated by Segal was adjusted to remove the savings that will flow to Partnership groups to establish the gross savings applicable to the state employee active plan. The savings where then adjusted to reflect the amount of the savings that will accrue the General Fund by multiplying the "Gross Svigns total Population" calculation by 65.4%.

State of CT
Requested Medical Benefit Changes and Estimated Savings
6/5/2017

Anthem Estimate

Benefit Description	Current Benefit	Proposed Benefit	Assumptions	Estimated Savings- FY 18			Estimated Savings- FY 19			Date to Operational (Year 1)[3]
				Gross Savings - Anthem Only	Gross Savings Total Population/(cost)	*GF Savings - Adjusted for % of Retirees for which new plan applies/ (cost)*	Gross Savings - Anthem Only	Gross Savings Total Population/(cost)	*GF Savings - Adjusted for % of Retirees for which new plan applies/ (cost)*	
Create financial incentive to utilize urgent care over ER	Urgent/Emergency Room: Actives: $15/$35 copay Pre 1999 retirees: $5	**$250 copay** $15 copay for Urgent Care $5 copay for Live Health Online	–Mandatory change –57% of ER visit = potentially avoidable –10% shift to UC –Limited shift to LHOL –Non shifting population incurs higher cost share	**$4,800,000**	**$5,448,354**	***$446,011.79***	**$4,800,000**	**$5,448,354**	***$1,036,282.72***	First of the month following 45 day notice from the State. For example, if Anthem receives notice on June 29, 2017, Anthem can implement this benefit change on September 1, 2017.
Implement full utilization management on Physical Therapy/Occupational Therapy (PT/OT) services (Orthonet) (**based upon medical necessity criteria**)	Covered 100% with unique arrangement through OrthoNet **(Consultative Only)**	Utilization Management PT/OT medical necessity review Covered 100%	– Same benefit structure – Same utilization in future period – Analysis excludes cases for single evaluation sessions	**$1,380,000**	**$1,566,402**	***$128,228.39***	**$1,380,000**	**$1,566,402**	***$297,931.28***	First of the month following 45 day notice from the State. See above example.
PCP & Specialist Tiering based on Quality & Cost Unique State built Tiered PCP & Specialty network where cost and quality determine the tier. The following **PCP Specialties** can be tiered: • Advanced Practice Nurse • Family practice • General practitioner • Internal Medicine • Pediatrics	$15 Copay	PCP Tiering: – Tier 1 (cost/quality): $0 copay – Tier 2 (cost/quality): $15 copay	–PCPs: • Baseline Tier 1 Percentage: 76% of episodes • Baseline Tier 2 Percentage: 24% of episodes Shift between Tier 1 and Tier 2 is estimated at 15% but cost savings is offset by reduced member liability, resulting in a negative benefit.	**($300,000)**	**($340,522)**	***($27,875.74)***	**($300,000)**	**($340,522)**	***($64,767.67)***	First of the month following 45 day notice from the State. See above example.
PCP & Specialist Tiering based on Quality & Cost Unique State built Tiered PCP & Specialty network where cost and quality determine the tier. The following **non-PCP Specialties** can be tiered: • Allergy & Immunology • Cardiology • Endocrinology • ENT • Gastroenterology • OBGYN • Ophthalmology • Ortho/Surgery • Rheumatology • Urology	$15 Copay	Specialist Tiering: – Tier 1 (cost/quality): $0 copay – Tier 2 (cost/quality): $15 copay	Baseline Tier 1 Percentage: 61.5% Baseline Tier 2 Percentage: 38.5% Percent of Tier 2 Projected to Shift: 15%	**$100,000**	**$113,507**	***$9,291.91***	**$100,000**	**$113,507**	***$21,589.22***	First of the month following 45 day notice from the State. See above example.
Site of Service: Diagnostic X-ray, High Cost Imaging and Lab	100% - $0 copay	• 100% coverage for designed reference labs, diagnostic X-ray centers and high cost imaging • 80% coverage for other In-network labs, diagnostic X-ray centers and high cost imaging • 60% out of network	– Benefit will have member cost savings depending on the Site of Service where certain lab and x-ray services are performed. – Lab services performed at an independent lab and designated freestanding are covered at 100%. – Services performed at an outpatient hospital facility or out-of-network have higher cost-shares. – Projected shift: 30%		**$0**	***$0.00***		**$0**	***$0.00***	First of the month following 90 day notice from the State.
Member incentive based program (SmartShopper) for the following services: • Colonoscopy • Hip Surgery • Knee Surgery • Knee Replacement • Spinal Surgery • Shoulder Surgery • Hysterectomy/Hysteroscopy • Sigmoidoscopy • Upper GI	N/A	**Benefit incentive linked to procedures and physicians	– 20% redirection. Assumes active employer engagement with member communication plan – Program incentives and savings per procedure are outlined on Attachment A – Savings are net of member incentives and administrative fees. Administrative fees equal to a percentage of the savings. - Actual active/<65 retiree split not yet available so savings based on an assumption that total dollars are split 70% active and 30% <65 retirees. **(Savings estimate to be adjusted when actual split available.)**	**$1,927,147**	**$2,187,454**	***$179,068.81***	**$1,927,147**	**$2,187,454**	***$416,056.07***	5/15/17: Pending further analysis
Increased co-pays for non-HEP drugs	co-pays are $5, $20, $35 for retail acute drugs and $5, $10, $25 for non-HEP Maintenance drugs	Increase Co-pays for all Non-HEP drugs to: $5 Gen Tier 1, $10 Gen Tier 2, $25 Preffered, $40 Non-preffered -	Assumes generic tiering threshold set at $50	**na**	**$4,598,100**	***$376,408.50***		**$4,598,100**	***$874,563.48***	
Adopting the CVS Standard Formulary	Open formulary	Adoption of the CVS standard formulary with modifications to the appeal process		**na**	**$6,956,800**	***$569,495.80***	**na**	**$6,956,800**	***$1,323,190.71***	
Total Savings[1]				**$7,907,147**	**$20,530,095**	**$1,680,629**	**$7,907,147**	**$20,530,095**	**$3,904,846**	
Estimated Anthem Implementation Costs[2]										
Estimated Net Savings				**$7,907,147**	**$8,975,195**	**$1,680,629**	**$7,907,147**		**$3,904,846**	

Notes:
1. Estimated savings are based on the pre-implementation baseline period. Year 2 estimated savings are not incremental to the year 1 savings. Please note that the savings are based on the number of covered lives. If the number of covered lives fluctuates (e.g., the State reduces its work force or the number of under 65 retirees aging out into Medicare exceeds the number of new under 65 retirees) the savings would be different.
2. With the exception of SmartShopperand Orthonet, current estimated Anthem implementation costs are $150,000 for both actives and retirees and apply in year 1 only. Costs to the State will be a direct pass through subject to a cap of $300,000. (For this sheet, Anthem administrative expenses are shown as $0 as the estimated expnses are captured on the Actives sheet.) The State will pay the lesser of Anthem's actual costs or $300,000. Anthem will invoice the State monthly. For SmartShopper, administrative costs apply in all years of the contract and will be based on a percentage of the savings. The estimated savings for SmartShopper are net of these costs so no additional costs are shown. Program savings are based on the level of member communication, education, and engagement. For Orthonet, the administrative costs are $0.28 pmpm in year 1 and year 2and the savings quoted is net of this expense. This pmpm will be added to the Anthem admin fee. The estimated savings for Orthonet are net of these costs so no additional costs are shown.
3. Anthem can implement all benefits except SmartShopper as of the first of the month following 45 day notice from the State. For example, if Anthem receives notice on June 29, 2017, Anthem can implement this benefit change on September 1, 2017. This timeline assumes the benefits as presented by Anthem to the State. Additional time may be required if the State makes any changes to the benefits (e.g., in connection with the tiered benefit, the State requests modification to the listing of PCPs or Specialists contained in Tier 1).
4. All savings assume 12 months of savings and woudl require adjustment for any mid fiscal year implmentation.

Calculation Notes:
1. The savings estimates provided by Anthem for the proposed benefit changes to the medical plan have been reviewed by the Segal and determined to be reasonable.
2. The savings estimates provided by Anthem are included in the "Gross Savings - Anthem Only" column and include only the impact on the Anthem population. The savings are adjusted to incorporate the impact of applying the changes to the Oxford population in the "Gross Savings Total Population Column".
3. For all items savings are then adjusted to relect the percentage of the pre-65 retiree population that is projected to be subject to the new provisions, which includes 3/4 of the projected retirees in FY 18 due to the 10/2/17 start implementation date. For FY 19 the 3/4 of projected retirees from FY 18 are added to the projected retirees in FY 19.
4. Savings are then adjusted to reflect the amount of the savings that will accrue the General Fund by multiplying the "Gross Savigns total Population" calculation by 65.4%.
5. ER savings were calculated by multiplying the active Anthem calculated savings by the percentage of ER costs associated with Pre-65 retirees in comparison to actives approximately 30%.
5. Pharmacy copay savings were provided by Segal and represent the aggregate savings for the Active population (Anthem and Oxford). The copay savings assume a differential in generic copays set at a threshold of $50.
6. The savings associated witht he adoption of the standard fromulary was calculated by Segal. The gross savings calculated by Segal was adjusted to remove the savings that will flow to Partnership groups to establish the gross savings applicable to the state employee active plan. The savings where then adjusted to reflect the amount of the savings that will accrue the General Fund by multiplying the "Gross Svigns total Population" calculation by 65.4%.
7. Retiree health care expenditures are not distributed across funds. Employer share is approximately 99.5%

Segal Estimate

	FY 18		FY 19	
	Gross Savings	General Fund	Gross Savings	General Fund
Medicare Advantage - Medical	$ 10,300,000	$ 10,860,000	$ 75,200,000	$ 75,840,000
Medical Advantage - Part_D	$ 52,400,000	$ 52,400,000	$ 54,700,000	$ 54,700,000
Total	**$ 62,700,000**	**$ 63,260,000**	**$ 129,900,000**	**$ 130,540,000**

Segal Consulting

30 Waterside Drive Suite 300 Farmington, CT 06032-3069
T 860.678.3000 www.segalco.com

MEMORANDUM

To: Thomas C. Woodruff, Ph.D
Director, Healthcare Policy & Benefit Services
Office of the State Comptroller, State of Connecticut

From: Daniel J. Rhodes, FSA, MAAA

Date: May 31, 2017

Re: Impact of Medicare Advantage Plan on OPEB Liability

As you requested, we have estimated the impact on the State's Other Post-Employment Benefit (OPEB) liabilities resulting from implementing a Medicare Advantage plan for the State's Medicare-eligible retirees.

As previously reported, the State's actuarial accrued liability (AAL) for OPEB as of June 30, 2015, was approximately $19.1 billion. That liability was projected to increase to $20.9 billion as of June 30, 2017, based on our prior valuation. Implementing the Medicare Advantage with Prescription Drug (MA-PD) plan rates, as proposed by UnitedHealthcare (UHC) in their final price proposal, would decrease the OPEB liability to $15.6 billion, a reduction of $5.3 billion or 25%.

Calculations are based on an average premium rate, effective January 1, 2018, for current retirees of $826 per year for the medical portion of the MA-PD, and $2,747 per year for the prescription portion. Future retirees were valued with the post-2011 plan rates of $713 per year for medical and $2,018 for prescription drug. The calculations account for the rate guarantees proposed by UHC for 2019, and assume costs beyond that point increase with our standard trend assumptions from our valuation report.

The calculations do not reflect any of the proposed changes in the tentative agreement for non-Medicare retirees. Because these changes only affect future non-Medicare retirees, the impact of these changes is relatively small compared to that of the MA-PD.

Except for the assumptions specifically discussed above, the actuarial methods and assumptions for this analysis are based on the draft State of Connecticut Other Post-Employment Benefits Program Actuarial Valuation as of June 30, 2015 published August 24, 2016. This calculation does not incorporate any changes that will be required under Governmental Accounting Standards Board (GASB) Statements 74 and 75, such as the change in required actuarial cost method, or any changes in the discount rate used to calculate the liabilities.

This actuarial work was prepared under the supervision of Daniel J. Rhodes, FSA, MAAA, who meets the qualifications of the American Academy of Actuaries to render the actuarial opinions contained herein.

We are available to answer questions about these results.

cc: Margaret E. Haering
Joshua Wojcik
Theresa DeMattie

8556075v1/13507.008

Attrition Savings Projection

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037
Retirements	1,473	1,569	1,524	1,728	1,944	1,597	1,551	1,634	1,678	1,660	1,660	1,660	1,660	1,660	1,660	1,660	1,660	1,660	1,660	1,660
% Refilled	67%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
New Vacancies	486	157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Timing	243	321	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative	243	565	643	643	643	643	643	643	643	643	643	643	643	643	643	643	643	643	643	643
Savings per vacancy	95,000	95,000	98,325	101,766	104,311	106,918	109,591	112,331	115,139	118,018	120,968	123,992	127,092	130,270	133,526	136,864	140,286	143,793	147,388	151,073
Annual Savings	23,089,275	53,631,300	63,221,992	65,434,761	67,070,630	68,747,396	70,466,081	72,227,733	74,033,427	75,884,262	77,781,369	79,725,903	81,719,051	83,762,027	85,856,077	88,002,479	90,202,541	92,457,605	94,769,045	97,138,271
GF Portion (91%)	21,011,240	48,804,483	57,532,012	59,545,633	61,034,274	62,560,131	64,124,134	65,727,237	67,370,418	69,054,679	70,781,046	72,550,572	74,364,336	76,223,444	78,129,030	80,082,256	82,084,313	84,136,420	86,239,831	88,395,827

Alternative Retirement Program - Savings Estimate

Savings:	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Existing Employees	5.0	5.0	6.7	6.9	7.1	7.3	7.5	7.7	7.8	8.0
New Employees	0.0	0.0	0.3	0.5	0.8	1.1	1.3	1.6	1.9	2.2
	5.0	5.0	7.0	7.5	7.9	8.3	8.8	9.3	9.8	10.3

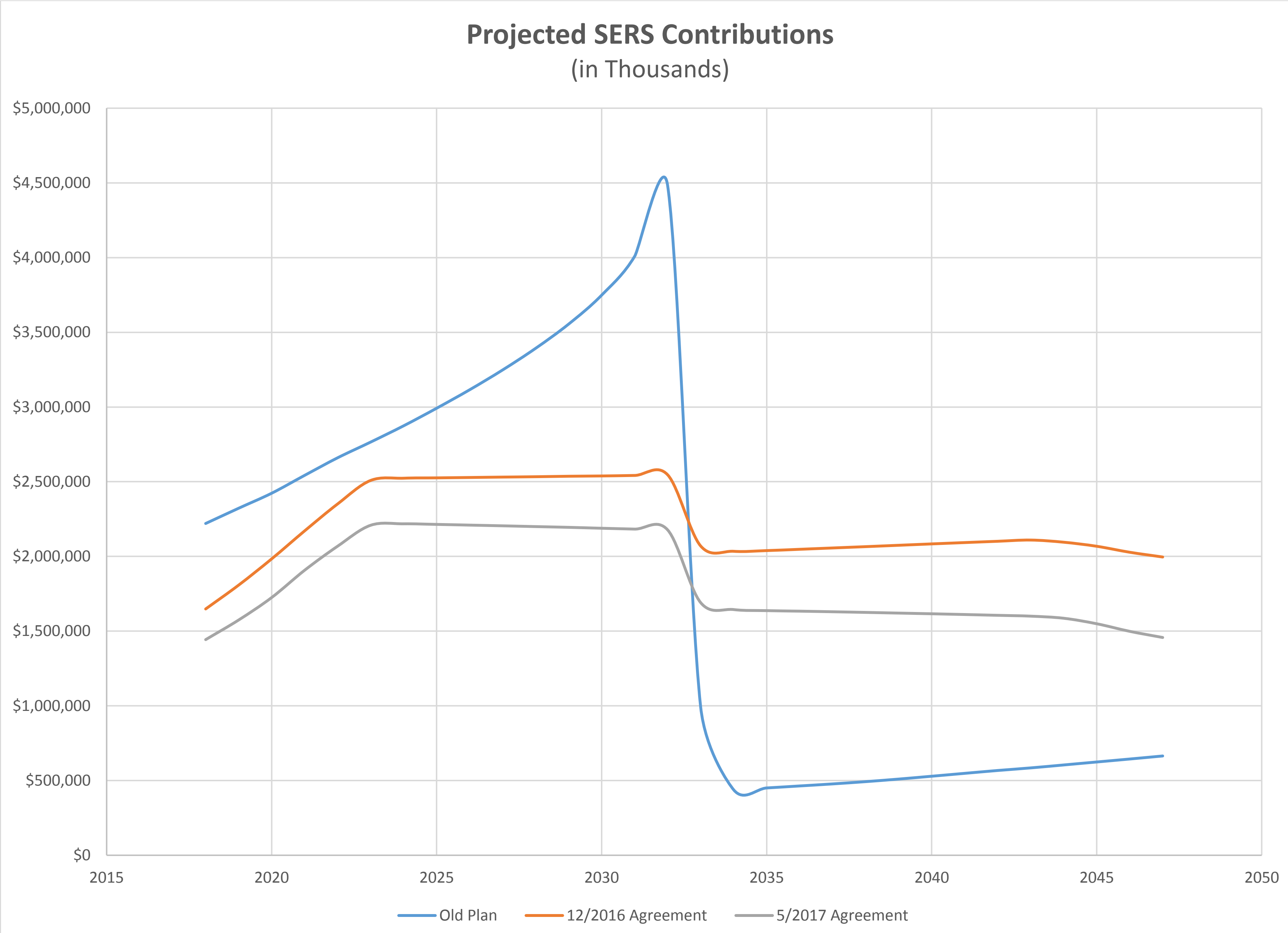
Savings:	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037
Existing Employees	8.2	8.4	8.7	8.9	9.1	9.3	9.6	9.8	10.0	10.3
New Employees	2.5	2.9	3.2	3.5	3.9	4.2	4.6	4.9	5.3	5.7
	10.8	11.3	11.8	12.4	13.0	13.5	14.1	14.7	15.4	16.0

Assumptions:
Existing Employees - FY18 state share decreases to 7.25% and then FY 20 decreases to 7%. Assumes wage increase of 3.5% in FYs 20 & 21, then 2.5% thereafter
New Employees - FYs 18 & 19 assume attrition then in FY20 and thereafter 200 new employees per year with average salary of $85,000 increasing by 2.5% per year with savings based on 6.5% state share vs. 8%,

Comparison of Estimated Employer Contributions under December 2016 and May 2017 SEBAC agreements vs. Old Plan @ 6.9% R.O.R.

Amounts in $Thousands

Fiscal Year	Old Plan	12/2016 Agreement	Projected Savings	5/2017 Agreement
2018	2,220,450	1,648,407	(205,297)	1,443,110
2019	2,322,499	1,808,051	(233,514)	1,574,537
2020	2,422,971	1,983,533	(258,818)	1,724,715
2021	2,542,647	2,171,097	(263,510)	1,907,587
2022	2,660,310	2,351,459	(282,890)	2,068,569
2023	2,765,233	2,508,559	(299,978)	2,208,581
2024	2,874,272	2,523,536	(305,286)	2,218,250
2025	2,991,909	2,525,848	(311,575)	2,214,273
2026	3,115,372	2,528,301	(318,666)	2,209,635
2027	3,248,134	2,531,022	(326,109)	2,204,913
2028	3,392,920	2,533,376	(333,746)	2,199,630
2029	3,555,131	2,536,640	(341,926)	2,194,714
2030	3,748,665	2,538,531	(350,036)	2,188,495
2031	4,008,592	2,541,955	(359,015)	2,182,940
2032	4,480,529	2,546,023	(368,650)	2,177,373
2033	991,947	2,069,773	(379,027)	1,690,746
2034	437,818	2,034,326	(389,963)	1,644,363
2035	450,447	2,038,993	(401,742)	1,637,251
2036	463,855	2,047,774	(414,157)	1,633,617
2037	477,520	2,056,607	(426,918)	1,629,689
2038	492,667	2,065,463	(440,108)	1,625,355
2039	509,944	2,074,638	(453,841)	1,620,797
2040	528,853	2,083,784	(467,678)	1,616,106
2041	548,226	2,092,698	(481,565)	1,611,133
2042	567,335	2,101,330	(495,493)	1,605,837
2043	584,664	2,109,576	(509,344)	1,600,232
2044	604,327	2,095,090	(508,819)	1,586,271
2045	624,273	2,067,951	(518,549)	1,549,402
2046	644,068	2,027,961	(529,293)	1,498,668
2047	664,485	1,996,102	(538,791)	1,457,311


Projected SERS Contributions
(in Thousands)
$5,000,000
$4,500,000
$4,000,000
$3,500,000
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0
2015
2020
2025
2030
2035
2040
2045
2050
Old Plan
12/2016 Agreement
5/2017 Agreement

CT SERS Projection of Members

Active Members						**Total Headcounts**						
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Tier I Hazardous	35	27	20	16	12	10	7	6	6	5	3	2
Tier II - Haz	1,512	1,229	924	726	567	439	321	249	193	147	112	84
Tier IIA - Haz	5,957	5,810	5,660	5,372	5,125	4,683	4,275	3,899	3,613	3,282	2,925	2,545
Tier III - Haz	2,551	2,433	2,344	2,276	2,217	2,170	2,128	2,089	2,052	2,017	1,985	1,954
Tier IV - Haz	0	583	1,141	1,688	2,212	2,753	3,320	3,834	4,332	4,833	5,331	5,822
Subtotal Hazardous	10,055	10,082	10,089	10,078	10,133	10,055	10,051	10,077	10,196	10,284	10,356	10,407
Tier IB	1,428	1,230	1,058	899	761	644	524	441	367	306	254	208
Tier IC	45	39	33	29	24	20	16	13	11	9	8	6
Tier II - Non	11,204	10,515	9,838	9,161	8,474	7,791	6,990	6,337	5,691	5,061	4,452	3,876
Tier IIA - Non	16,063	15,235	14,469	13,728	13,016	12,305	11,521	10,872	10,234	9,603	8,989	8,389
Tier III - Non	11,224	9,586	8,595	7,954	7,479	7,089	6,733	6,397	6,044	5,670	5,294	4,939
Tier IV - Non	0	3,332	5,936	8,168	10,130	12,116	14,184	15,881	17,474	19,086	20,669	22,193
Subtotal Non Hazardous	39,964	39,937	39,929	39,939	39,884	39,965	39,968	39,941	39,821	39,735	39,666	39,611
Total	50,019	50,019	50,018	50,017	50,017	50,020	50,019	50,018	50,017	50,019	50,022	50,018

Emerging Retirees Each Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Tier I Hazardous	0	8	6	4	4	2	2	1	1	1	2	1
Tier II - Haz	0	271	297	191	154	124	115	69	54	44	35	26
Tier IIA - Haz	0	44	57	202	172	375	348	320	235	285	319	347
Tier III - Haz	0	1	0	0	1	0	1	0	1	0	1	1
Tier IV - Haz	0	0	0	0	0	0	0	0	0	0	0	0
Hazardous	0	324	360	397	331	501	466	390	291	330	357	375
Tier IB	0	184	160	150	131	111	116	78	70	58	49	43
Tier IC	0	6	5	4	4	5	3	3	2	1	2	1
Tier II - Non	0	498	514	537	567	582	713	580	584	579	566	540
Tier IIA - Non	0	304	348	398	411	452	556	440	448	459	459	460
Tier III - Non	0	95	86	83	80	77	90	106	156	207	245	241
Tier IV - Non	0	0	0	0	0	0	0	0	0	0	0	0
Non Hazardous	0	1,087	1,113	1,172	1,193	1,227	1,478	1,207	1,260	1,304	1,321	1,285
Total	0	1,411	1,473	1,569	1,524	1,728	1,944	1,597	1,551	1,634	1,678	1,660

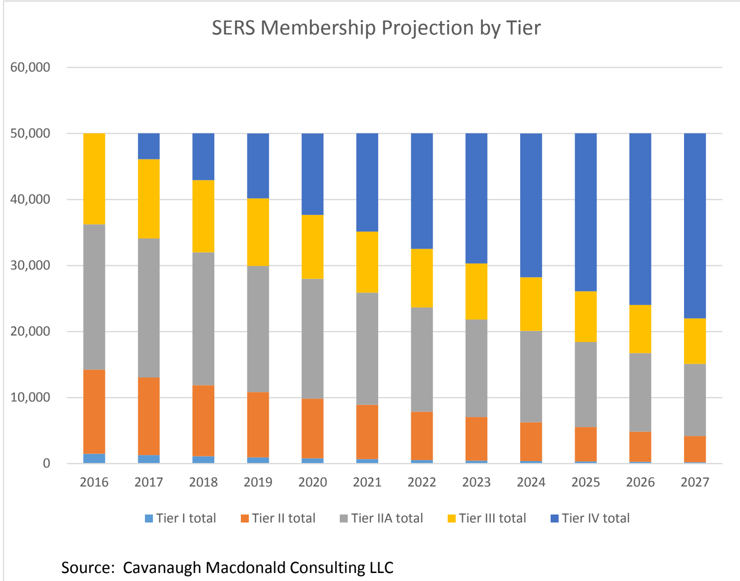
Total Eligible	6/30/2016	pct retiring	6/30/2022	
Hazardous	1276	25.4%	3899	61%
Tier I	1187	16.0%	1464	60%
Tier II/IIA	1649	48.6%	6919	85%
Tier III	193	49.2%	680	75%

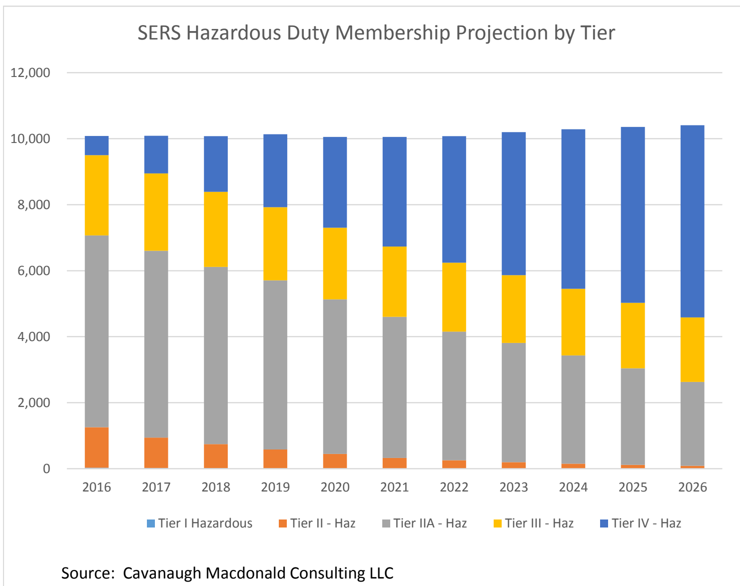
Cumulative Percent of 2022 Eligibles retiring by year

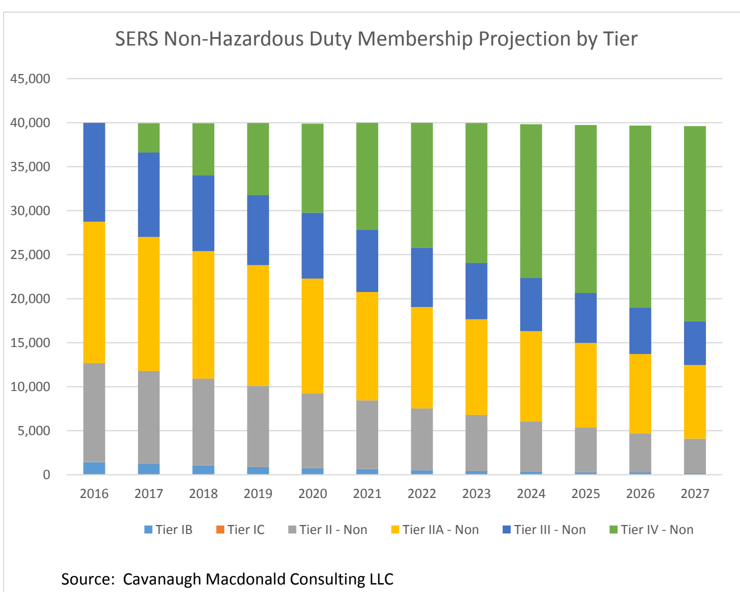
	2017	**2018**	**2019**	**2020**	**2021**	**2022**
Hazardous	8.3%	17.5%	27.7%	36.2%	49.1%	61.0%
Tier I	13.0%	24.2%	34.8%	44.0%	51.9%	60.0%
Tier II/IIA	11.6%	24.0%	37.6%	51.7%	66.6%	85.0%
Tier III	14.0%	26.6%	38.8%	50.6%	61.9%	75.1%

	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Tier I total	1,508	1,296	1,111	944	797	674	547	460	384	320	265	216
Tier II total	12,716	11,744	10,762	9,887	9,041	8,230	7,311	6,586	5,884	5,208	4,564	3,960
Tier IIA total	22,020	21,045	20,129	19,100	18,141	16,988	15,796	14,771	13,847	12,885	11,914	10,934
Tier III total	13,775	12,019	10,939	10,230	9,696	9,259	8,861	8,486	8,096	7,687	7,279	6,893
Tier IV total	0	3,915	7,077	9,856	12,342	14,869	17,504	19,715	21,806	23,919	26,000	28,015

Retirement Rates	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**
Tier I Hazardous	0.0%	29.6%	30.0%	25.0%	33.3%	20.0%	28.6%	16.7%	16.7%	20.0%	66.7%	50.0%
Tier IB	0.0%	15.0%	15.1%	16.7%	17.2%	17.2%	22.1%	17.7%	19.1%	19.0%	19.3%	20.7%
Tier IC	0.0%	15.4%	15.2%	13.8%	16.7%	25.0%	18.8%	23.1%	18.2%	11.1%	25.0%	16.7%
Tier II - Non	0.0%	4.7%	5.2%	5.9%	6.7%	7.5%	10.2%	9.2%	10.3%	11.4%	12.7%	13.9%
Tier II - Haz	0.0%	22.1%	32.1%	26.3%	27.2%	28.2%	35.8%	27.7%	28.0%	29.9%	31.3%	31.0%
Tier IIA - Non	0.0%	2.0%	2.4%	2.9%	3.2%	3.7%	4.8%	4.0%	4.4%	4.8%	5.1%	5.5%
Tier IIA - Haz	0.0%	0.8%	1.0%	3.8%	3.4%	8.0%	8.1%	8.2%	6.5%	8.7%	10.9%	13.6%
Tier III - Non	0.0%	1.0%	1.0%	1.0%	1.1%	1.1%	1.3%	1.7%	2.6%	3.7%	4.6%	4.9%
Tier III - Haz	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
Tier IV - Non		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tier IV - Haz		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	0.0%	2.8%	2.9%	3.1%	3.0%	3.5%	3.9%	3.2%	3.1%	3.3%	3.4%	3.3%


SERS Membership Projection by Tier
60,000
50,000
40,000
30,000
20,000
10,000
0
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
Tier I total
Tier II total
Tier IIA total
Tier III total
Tier IV total
Source: Cavanaugh Macdonald Consulting LLC


SERS Hazardous Duty Membership Projection by Tier
12,000
10,000
8,000
6,000
4,000
2,000
0
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Tier I Hazardous
Tier II - Haz
Tier IIA - Haz
Tier III - Haz
Tier IV - Haz
Source: Cavanaugh Macdonald Consulting LLC


SERS Non-Hazardous Duty Membership Projection by Tier
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
Tier IB
Tier IC
Tier II - Non
Tier IIA - Non
Tier III - Non
Tier IV - Non
Source: Cavanaugh Macdonald Consulting LLC

Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve

June 5, 2017

Ms. Brenda Halpin, Director
State of Connecticut
Office of the State Comptroller
Retirement Services Division
55 Elm Street
Hartford, CT 06106

Dear Ms. Halpin:

Enclosed is the revised "Connecticut State Employees Retirement System Report of the Actuary on the Valuation Prepared as of June 30, 2016".

Please let us know if there are any questions concerning the report.

Sincerely yours,

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

Edward J. Koebel, FCA, MAAA, EA
Principal and Consulting Actuary

JJG/EAK:kc

Enc.

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CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM

REPORT OF THE ACTUARY ON THE VALUATION PREPARED AS OF JUNE 30, 2016

June 5, 2017

State of Connecticut
State Employees Retirement Commission
55 Elm Street
Hartford, CT 06106

Members of the Commission:

Connecticut General Statutes Section 5-155a governs the operation of the Connecticut State Employees Retirement System (SERS). The actuary makes periodic valuations of the contingent assets and liabilities of the Retirement System at the direction of the Commission. We are pleased to submit the revised report giving the results of the actuarial valuation of the Retirement System prepared as of June 30, 2016. This revision is necessary to incorporate the recent Framework Document between the State and SEBAC and reflect the resulting changes to the required funding for the upcoming biennium.

The purpose of the report is to provide a measure of the funded status of SERS as of June 30, 2016 and to recommend rates of actuarially determined contribution amounts for the fiscal year ending June 20, 2018 and June 30, 2019. The report indicates that annual actuarially determined employer contribution amount of $1,443,110,000 for the fiscal year ending June 30, 2018 and $1,574,537,000 for the fiscal year ending June 30, 2019 is necessary to meet the funding objectives of the System.

Since the previous valuation, the actuarial assumptions and methods have been changed to reflect the latest experience investigation for the five-year period ending June 30, 2015 and the December 8, 2016 Memorandum of Understanding (MOU) agreement between the State and the State Employees Bargaining Agent Coalition (SEBAC). In addition, this revised report reflects the May 22, 2017 Framework Document between the State and SEBAC in regards to the plan provision and assumption changes for current members of SERS. In order for the changes to be in effect, the parties must sign a Tentative Agreement, which the Union membership must ratify, and which is also conditioned on Legislative approval. The Commission would then consider this valuation for adoption.

In preparing the valuation, the actuary relied on data provided by the Comptroller's Office. While not verifying data at the source, the actuary performed tests for consistency and reasonableness.

The System is funded on an actuarial reserve basis. The actuarial assumptions recommended by the actuary and adopted by the Commission are reasonably related to the experience under the System and to reasonable expectations of anticipated experience under the System. The funding objective of the System is that contribution amounts will be sufficient to fully fund the liabilities of System over a reasonable funding period. The funding method determines the unfunded actuarial accrued liability (UAAL) as the excess of actuarial accrued liability over the actuarial value of assets.

In accordance with the MOU agreement dated December 8, 2016, the UAAL as of June 30, 2016 was allocated into two bases. This first base is the portion of the current UAAL attributable to the plan as of 1984 (called the Statutory UAAL base) and the second base is the remainder of the UAAL (called the Transitional UAAL base). The Statutory UAAL base is amortized over the closed 40-year period beginning 1992 while the Transitional UAAL base is amortized over a closed 30-year period beginning in 2016. Amortization payments determined in this valuation are expected to be contributed in the biennium beginning July 1, 2018. To appropriately determine the required funding with the scheduled timing of payments, we have rolled the UAAL bases forward to June 30, 2017 and June 30, 2018 to calculate amortization payments to be made for the respective 2018 and 2019 fiscal years.

This is to certify that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic 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 or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal actuarial valuation, an analysis of the range of results is not presented herein.

The actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. Use of these computations for purposes other than meeting these requirements may not be appropriate.

The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely yours,

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

Edward J. Koebel, FCA, MAAA, EA
Principal and Consulting Actuary

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CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM
REPORT OF THE ACTUARY
ON THE REVISED VALUATION
PREPARED AS OF JUNE 30, 2016

SECTION I - SUMMARY OF PRINCIPAL RESULTS

1. For convenience of reference, the principal results of the current and preceding valuations are summarized below:

Valuation Date	June 30, 2016	June 30, 2014
Number of active members	50,019	49,976
Annual compensation as of Valuation Date	$ 3,720,751,429	$ 3,487,576,617
Retired members and beneficiaries:		
Number	48,191	45,803
Annual allowances	$ 1,745,785,103	$ 1,576,606,022
Deferred Vested Members:		
Number	1,412	1,457
Annual allowances	$ 20,316,080	$ 20,956,362
Assets:		
Market Value	$ 10,636,702,645	$ 10,472,567,077
Actuarial Value	$ 11,922,965,860	$ 10,584,795,257
Unfunded actuarial accrued liability	$ 20,387,369,150	$ 14,920,814,520
Single Equivalent Amortization period (years)	25.2	17.0
Funded Ratio based on Actuarial Assets	36.9%	41.5%
Funded Ratio based on Market Assets	32.9%	41.1%
Actuarially Determined Employer Contribution (ADEC):		
For Fiscal Year Ending June 30, 2016		$1,514,467,000
For Fiscal Year Ending June 30, 2017		$1,569,142,000
For Fiscal Year Ending June 30, 2018	$1,443,110,000	
For Fiscal Year Ending June 30, 2019	$1,574,537,000	

2. All amounts shown that are prior to June 30, 2010 were developed and/or reported by the prior actuarial firm. The results of the valuation are given in Schedule A.

3. Comments on the valuation results are given in Section IV, comments on the experience and actuarial gains and losses during the valuation year are given in Section VII and the rates of contribution payable by employers are given in Section V.

4. Schedule B of this report presents the development of the actuarial value of assets.

5. Schedule D details the actuarial assumptions and methods employed. Since the last valuation, changes to the demographic assumptions include changes to the rates of withdraws, disability retirement, service retirement and mortality. The analysis and basis for these changes are included in the latest Experience Investigation for the five-year period ending June 30, 2015. Further, economic assumptions (assumed rates of inflation and investment return), the actuarial cost method, and the UAAL amortization methodology were changed in accordance with the Memorandum of Agreement (MOU) between the State and SEBAC effective December 8, 2016. In addition, several assumptions were revised after the State and SEBAC came to an agreement effective May 22, 2017 for new plan structure. The following changes were made to assumptions:

    a. Three-Year Wage Freeze: We have assumed the rate of across-the-board (wage inflation) is 0% for years beginning July 1, 2016, 2017 and 2018 for each active member. We also reduced promotions and merit salary increases by one-half the rate of increase for the three-year period.

    b. COLA: We have assumed the rate of increase due to the COLA provisions for those retiring on and after July 1, 2022 is 1.95% annually. We assumed the moratorium COLA provision to provide a partial COLA in higher CPI increase environment during the moratorium will result in the first COLA being 0.15% larger (2.10%).

    c. We have assumed that the assumed rates of retirements will increase by 20% of current assumed rates in the year before July 1, 2022 to reflect the potential behavior of future eligible members to avoid the July 1, 2022 COLA change and moratorium.

6. Schedule F gives a summary of the benefit and contribution provisions of the plan. The following changes were made to the plan provisions since the last valuation:

    a. A 3-year freeze on all salary increases for fiscal years ending 2017, 2018 and 2019.

b. The annual COLA for those retiring on or after July 1, 2022 is based on the annual rate of increase in CPI-W from 0.0% to 2.0%, plus 60% of the annual rate of increase in CPI-W from 3.33% to 6.0%, plus 75% of the annual rate of increase in CPI-W above 6.0% and with a cap on the COLA rate of 7.5%.

c. A COLA moratorium for those retiring on or after July 1, 2022 for the first 30 months of retirement benefits. If rate of increase in CPI-W exceeds an annualized rate of 5.5% during the initial 18 month period of receiving retirement benefits, the COLA provided beginning with the 31st monthly benefit includes an additional adjustment based on the annual COLA rate as determined above using the annualized rate over the 18 month period. The COLA rate applied is reduced by 2.5% and then multiplied by 1.5 to reflect the 18 month period.

d. Increase to all non-Tier IV members' contribution rates by 1.5% of compensation effective July 1, 2017 and an additional 0.5% of compensation effective July 1, 2019.

e. In years where employer contribution increase due to poor asset returns, half the increase is applied to Tier IV member contribution rate of up to 2% in total.

f. Tier IV Hybrid Plan Structure for All New Hires (Non-Hazardous and Hazardous) after July 1, 2017:
   i. Non-Hazardous has same retirement eligibility as Tier III
   ii. Non-hazardous benefit multiplier is 1.30% with no breakpoint
   iii. Hazardous duty requires 25 years of service to retire
   iv. Employees contribute 3% more than Tier III employees into the DB Plan.
   v. Employers contribute 1% and employees must contribute at least 1% to DC portion of Hybrid Plan.

7. The Governmental Accounting Standards Board issued Statement No. 67 (GASB 67) in June 2012 and is effective for plan years beginning after June 15, 2013. GASB 67 replaced GASB 25 for plans and a separate GASB 67 report will be prepared for the Commission. We have provided some supplemental disclosure information and tables in Section VI.

8. As shown in the Summary of Principal Results, the funding ratio is the ratio of the actuarial value of assets to the accrued liability. The funded ratio is an indication of progress in funding the

promised benefits using a long-term, stable funding approach. Since the ratio is less than 100%, there is a need for contributions in addition to the plan's normal cost. The funded ratio based on the market value of assets is also provided for informational purposes.

Connecticut State Employees Retirement System

Comparative Schedule*

	Active Members				Retired Lives				Valuation Results ($ thousands)		
Valuation Date June 30	Number	Payroll ($ thousands)	Average Salary	% increase from previous valuation	Number	Active/ Retired Ratio	Annual Benefits ($ thousands)	Benefits as % of Payroll	Accrued Liability	Valuation Assets	UAAL
2008	53,196	$3,497,445	$65,746	4.1	38,093	1.4	$1,047,479	29.9%	$19,243,343	$9,990,247	$9,253,126
2010	50,064	3,295,666	65,829	0.1	41,782	1.2	1,264,025	38.4	21,054,197	9,349,605	11,704,592
2011	47,778	3,210,666	67,200	2.1	44,051	1.1	1,391,091	43.3	21,216,725	10,122,765	11,003,960
2012	47,868	3,354,682	70,082	4.3	43,887	1.1	1,424,477	42.5	23,018,752	9,744,986	13,273,766
2014	49,976	3,487,577	69,785	(0.4)	45,803	1.1	1,576,606	45.2	25,505,610	10,584,795	14,920,815
2016	50,019	3,720,751	74,387	6.6	48,191	1.0	1,745,785	46.9	32,310,335	11,922,966	20,387,369

*All amounts prior to 2010 reported by prior actuarial firm.

SECTION II - MEMBERSHIP

Data regarding the membership of the System for use as a basis for the valuation were furnished by the Comptroller's office. The following tables summarize the membership of the Retirement System as of June 30, 2016 upon which the valuation was based. Detailed tabulations of the data are given in Schedule G.

Active Members

			Group Averages		
Group	Number	Payroll	Salary	Age*	Service*
Tier I – Hazardous	35	$3,867,315	$110,495	58.7	31.9
Tier I – Plan B	1,428	140,292,521	98,244	59.5	34.6
Tier I – Plan C	45	4,067,185	90,382	61.1	34.4
Tier II – Hazardous	1,512	153,262,541	101,364	51.0	22.5
Tier II – Others	11,204	995,351,864	88,839	54.9	24.9
Tier IIA – Hazardous	5,957	489,700,682	82,206	44.0	12.5
Tier IIA – Others	16,063	1,141,771,811	71,081	48.4	11.3
Tier III – Hazardous	2,551	156,526,887	61,359	34.4	2.5
Tier III – Hybrid Plan	2,087	187,238,827	89,717	50.4	12.7
Tier III – Others	9,137	448,671,796	49,105	38.7	2.3
Total	50,019	$3,720,751,429	$74,387	47.3	13.5

*Years

Of the 50,019 active members, 36,320 are vested and 13,699 are non-vested.

Retired Lives

			Group Averages	
Type of Benefit Payment	No.	Annual Benefits	Benefit	Age*
Retired – Pre 1980	966	$17,718,533	$18,342	89.8
Retired – 1980 - 1997	12,048	393,601,362	32,669	81.1
Retired – 1997 - 2011	24,358	944,154,694	38,762	68.1
Retired – 2011+	10,819	390,310,514	36,076	61.0
Total	48,191	$1,745,785,103	$36,226	70.2

*Years

This valuation also includes 1,412 deferred vested members with estimated annual benefits of $20,316,080.

SECTION III - ASSETS

1. As of June 30, 2016, the total market value of assets amounted to $10,636,702,645 as reported by the Comptroller's Office. This amount includes $15,989,968 of receivables as of the valuation date. The estimated investment return for the two plan years since the last valuation were 3.43% and (0.16%), respectively. Schedule C shows receipts and disbursements of the System for the two years preceding the valuation date and a reconciliation of the fund balances at market value.

2. The actuarial value of assets used for the current valuation was $11,922,965,860. The estimated investment return for the two plan years on an actuarial value of assets basis was 8.46% and 5.30%, respectively, which can be compared to the investment return assumed over the two-year period of 8.00% (the change in assumed investment rate of return applies to year following June 30, 2016). Schedule B shows the development of the actuarial value of assets as of June 30, 2016.

3. Schedule C shows receipts and disbursements of the System for the two years preceding the valuation date and a reconciliation of the fund balances at market value.

SECTION IV – COMMENTS ON VALUATION

1. Schedule A of this report outlines the results of the valuation of the Retirement System as of June 30, 2016. The valuation was prepared in accordance with the actuarial assumptions and methods set forth in Schedule D and the actuarial cost method which is described in Schedule E.

2. The valuation shows that the System has a total actuarial accrued liability of $32,310,335,010, of which $22,931,601,402 is for the benefits payable on account of present retired members, beneficiaries of deceased members, and inactive members entitled to deferred vested benefits, and $9,378,733,608 is for the benefits expected to be payable on account of present active members, based on service to the valuation date. Against these liabilities, the System has total present assets for valuation purposes of $11,922,965,860 as of June 30, 2016. When this amount is deducted from

the actuarial accrued liability of $32,310,335,010, there remains $20,387,369,150 as the unfunded actuarial accrued liability (UAAL).

3. The December 8, 2016 Memorandum of Agreement (MOU) between the State and SEBAC contains several changes to the funding methods and assumptions used in developing valuation results. First, the actuarial cost method utilized in the valuation is the Entry Age Normal cost method. This cost method is used to determine the annual normal cost contribution for active members as well as the determination of the unfunded actuarial accrued liability. Second, the amortization of the UAAL is reset to separately amortize the portion attributable to the unfunded liability as of 1984 (Statutory UAAL base) over the period ending June 30, 2032 and the remaining UAAL (Transitional UAAL base) which is funded over a 30-year period ending June 30, 2047. Future actuarial gains and losses will be amortized over closed 25-year periods beginning the year each separate base is established. The December 8, 2016 MOU also changed the amortization method from a level percentage of payroll amortization method to a level dollar method to be phased in over a 5 year period. Finally, on May 22, 2017, the State and SEBAC produced a Framework Document that made changes to the plan structure for current and future members of SERS. The plan and assumption changes were summarized on page 2 and 3. All of these changes, in addition to the change in the assumed rate of inflation (from 2.75% to 2.50%) and the change in the assumed rate of investment return (from 8.00% to 6.90%) are expected to markedly enhance the stability of valuation results in future years. .

4. The employer's contributions to the System consist of normal cost contributions and accrued liability contributions. The normal cost, now determined using the Entry Age Normal cost method, represents the ultimate cost of the benefits and the accrued liability contribution is an addition (reduction in case of a surplus) due to the amortization of the unfunded accrued liability. The projection of valuation results indicates that annual employer normal cost contributions at the amount of $262,733,000 for the 2018 fiscal year are required to provide the currently accruing benefits of the System.

5. The following table provides the roll forward of the UAAL bases to June 30, 2017 and June 30, 2018 and the derivation of the amortization amounts required in accordance with the MOU and Framework Agreement ($ in thousands).

UAAL Bases	Statutory Base	Transitional Base	Total
1. UAAL as of June 30, 2016	$4,138,969	$16,248,400	$20,387,369
2. Actual Payment for FYE 2017	(375,871)	(913,174)	(1,289,045)
3. Interest on Amounts [(1) x .069 + (2) x .0345]	272,621	1,089,635	1,362,256
4. Expected Asset (Gain)/Loss Recognition for 2017	0	108,194	108,194
5. Expected UAAL as of June 30, 2017 (1+2+3+4)	4,035,719	16,533,055	20,568,774
6. Amortization Payment for FYE 2018	(333,558)	(846,819)[1]	(1,180,377)
7. Interest on Amounts [(5) x .069 + (6) x .0345]	266,957	1,111,566	1,378,523
8. Expected Asset (Gain)/Loss Recognition for 2018	0	149,139	149,139
9. Expected UAAL as of June 30, 2018 (5+6+7+8)	3,969,118	16,946,941	20,916,059
10. Amortization Payment for FYE 2019	(362,941)	(965,891)[2]	(1,328,832)

1. Includes $6,686,000 for the amortization of the 2017 expected asset loss.
2. Includes $7,398,000 for the amortization of the 2017 expected asset loss and $9,925,000 for the amortization of the 2018 expected asset loss.

6. As shown in the table above, we have determined that an amortization payment of $1,180,377,000 is required in the fiscal year ending June 30, 2018 and an amortization payment of $1,328,832,000 is required in the fiscal year ending June 30, 2019 to amortize the unfunded accrued liability for the respective fiscal years in accordance with the MOU and the Framework Document.

7. Schedule J of this report shows the amortization schedule for the total UAAL.

SECTION V – CONTRIBUTIONS PAYABLE BY EMPLOYER

The following table shows the actuarially determined contribution payable by the employer as determined from the present valuation for the 2017/2018 fiscal year and the 2018/2019 fiscal year.

Contribution for	Fiscal Year Ending June 30, 2018	Fiscal Year Ending June 30, 2019
A. Normal Cost:		
Service retirement benefits	$378,975,000	$363,035,000
Disability benefits	2,025,000	1,963,000
Survivor benefits	20,610,000	19,252,000
Total Normal Cost	$401,610,000	$384,250,000
B. Less Member Contributions	(138,877,000)	(138,545,000)
C. Employer Normal Cost	$262,733,000	$245,705,000
D. Unfunded Actuarial Accrued Liabilities	1,180,377,000	1,328,832,000
E. Total (C. + D.)	$1,443,110,000	$1,574,537,000

The following table shows a breakdown by group of the employer normal cost amount with interest to the middle of the 2017/2018 fiscal year and rate as determined in the valuation as of June 30, 2016.

Group	Normal Cost	Normal Rate
Tier I – Hazardous	$675,195	22.52%
Tier I – Plan B	10,388,234	8.36%
Tier I – Plan C	59,181	1.82%
Tier II – Hazardous	23,602,751	18.48%
Tier II – Others	58,339,773	6.14%
Tier IIA – Hazardous	69,904,811	14.14%
Tier IIA – Others	55,973,359	5.00%
Tier III – Hazardous	15,479,691	9.57%
Tier III – Hybrid Plan	9,179,224	4.92%
Tier III – Others	19,130,429	4.04%
Total	262,732,648	7.28%

SECTION VI – ACCOUNTING INFORMATION

1. Governmental Accounting Standards Board (GASB) issued Statements No. 67 and 68 which replaced Statements No. 25 and 27 for plan years beginning after June 15, 2013. The information required under the new GASB Statements will be issued in separate reports. The following is a distribution of the number of employees by type of membership:

NUMBER OF ACTIVE AND RETIRED MEMBERS
AS OF JUNE 30, 2016

GROUP	NUMBER
Retirees and beneficiaries currently receiving benefits	48,191
Terminated employees entitled to benefits but not yet receiving benefits	1,412
Active plan members	50,019
Total	99,622

2. Another such item is the schedule of funding progress as shown below.

SCHEDULE OF FUNDING PROGRESS
(Dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) - PUC (b)	Unfunded AAL (UAAL) (b – a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b – a) / c)
6/30/2008	$9,990,247	$19,243,373	$9,253,126	51.9%	$3,497,445	264.6%
6/30/2010	9,349,605	21,054,197	11,704,592	44.4	3,295,666	355.2
6/30/2011	10,122,765	21,126,725	11,003,960	47.9	3,210,666	342.7
6/30/2012	9,744,986	23,018,752	13,273,766	42.3	3,354,682	395.7
6/30/2014	10,584,795	25,505,610	14,920,815	41.5	3,487,577	427.8
6/30/2016	11,922,966	32,310,335	20,387,369	36.9	3,720,751	547.9

All figures prior to 6/30/2010 were reported by the prior actuarial firm.

3. The following shows the schedule of employer contributions (all dollar amounts are in thousands).

Fiscal Year Ending June 30	Valuation Date Ending June 30	Annual Required Contribution	Actual Contribution	Percentage Contributed
2014	2012	$ 1,268,935	$ 1,268,890	100.0%
2015	2012	1,379,189	1,371,651	99.5%
2016	2014	1,514,467	1,501,805	99.2%
2017	2014	1,569,142	N/A	N/A
2018	2016	1,443,110	N/A	N/A
2019	2016	1,574,537	N/A	N/A

4. The information presented in the required supplementary schedules was determined as part of the actuarial valuation at June 30, 2016. Additional information as of the latest actuarial valuation follows.

Valuation date	6/30/2016
Actuarial cost method	Entry Age Normal
Amortization method	Level percent of payroll, closed 5 year phase into level dollar
Remaining amortization period	25.1 years
Asset valuation method	5-year smoothed actuarial value
Actuarial assumptions:	
Investment rate of return*	6.90%
Projected salary increases*	3.50% - 19.50%
Cost-of-living adjustments	1.95% - 3.25%
Social Security Wage Base	3.50%
*Includes inflation at	2.50%

SECTION VII – EXPERIENCE

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year to year fluctuations are common. Detail on the derivation of the experience gain/(loss) for the two year period ended June 30, 2016 is shown below. Schedule H provides detailed gain/(loss) by source.

		$ Millions
(1)	UAAL* as of June 30, 2014	$ 14,920.8
(2)	Total Normal cost from 2014 valuation	355.9
(3)	Actual Employer and Employee contributions	1,565.1
(4)	Interest accrual: [[(1) +(2)] x .08] - [(3) x .0392]	1,160.7
(5)	Expected UAAL as of June 30, 2015: (1) + (2) – (3) + (4)	$ 14,872.3
(6)	Total Normal cost for 2015 fiscal year	371.7
(7)	Actual Employer and Employee contributions	1,652.8
(8)	Interest accrual: [[(5) + (6)] x .08] - [(7) x .0392]	1,154.7
(9)	Expected UAAL as of June 30, 2016: (5) + (6) - (7) + (8)	$ 14,745.9
(10)	MOU/Assumption Changes	5,918.7
(11)	Framework Changes	(1,306.4)
(12)	Expected UAAL as of June 30, 2016: (9) + (10) + (11)	$ 19,358.2
(13)	Actual UAAL as of June 30, 2016	$ 20,387.4
(14)	Gain/(loss): (12) – (13) (See Schedule H)	$ (1,029.2)
(15)	Gain/(loss) as percent of actuarial accrued liabilities at June 30, 2014 ($25,505.6)	(4.0)%

*Unfunded actuarial accrued liability.

Valuation Date June 30	Actuarial Gain/(Loss) as a % of Beginning Accrued Liabilities
2012	(4.2)%
2014	(5.8)%
2016	(4.0)%

SCHEDULE A

RESULTS OF VALUATION

PREPARED AS OF JUNE 30, 2016

	JUNE 30, 2016	JUNE 30, 2014
1. ACTUARIAL ACCRUED LIABILITY		
Present value of prospective benefits payable in respect of:		
(a) Present active members		
- Tier I – Hazardous Duty	$ 34,072,996	$ 49,210,224
- Tier I – Plan B	1,014,122,784	1,173,883,113
- Tier I – Plan C	27,450,256	37,753,401
- Tier II – Hazardous Duty	1,090,001,648	1,188,010,935
- Tier II – All Others	3,393,530,559	2,715,215,560
- Tier IIA – Hazardous Duty	1,681,131,552	912,871,620
- Tier IIA – All Others	1,605,639,996	1,057,034,112
- Tier III – Hazardous Duty	65,732,535	9,671,840
- Tier III – Hybrid Plan	358,214,031	204,950,079
- Tier III – All Others	108,837,251	27,212,681
- Total actives	$ 9,378,733,608	$ 7,375,813,565
(b) Present inactive members and members entitled to deferred vested benefits:	266,708,800	225,853,075
(c) Present annuitants and beneficiaries	22,664,892,602	17,903,943,137
(d) Total actuarial accrued liability [1(a) + 1(b) + 1(c)]	$32,310,335,010	$ 25,505,609,777
2. ACTUARIAL VALUE OF ASSETS	$ 11,922,965,860	$ 10,584,795,257
3. UNFUNDED ACTUARIAL ACCRUED LIABILITY [1(d) – 2]	$ 20,387,369,150	$ 14,920,814,520

Note: the June 30, 2016 valuation results reflect all changes to the plan provisions, methods and assumptions, including the decrease in the investment rate of return assumption from 8.00% to 6.90%.

SCHEDULE B

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

		June 30, 2016	June 30, 2015	June 30, 2014
(1)	Actuarial Value Beginning of Year*	$11,389,603,128	$10,584,795,257	$9,784,500,362
(2)	Market Value End of Year**	10,636,702,645	10,737,492,074	10,472,567,077
(3)	Market Value Beginning of Year	10,737,492,074	10,472,567,077	9,182,442,986
(4)	Cash Flow			
	(a) Contributions**	1,652,823,497	1,565,148,396	1,419,894,684
	(b) Disbursements	(1,736,278,654)	(1,657,588,460)	(1,570,558,006)
	(c) Net: (4)(a) + (4)(b)	(83,455,157)	(92,440,064)	(150,663,322)
(5)	Investment Income			
	(a) Market Total: (2) – (3) – (4)(c)	(17,334,272)	357,365,061	1,440,787,413
	(b) Assumed Rate	8.00%	8.00%	8.00%
	(c) Amount for Immediate Recognition: [(1) x (5)(b)] + [(4)(c) less Receivable**] x (5)(b) x 0.5	907,190,445	842,839,661	776,485,566
	(d) Amount for Phased-In Recognition: (5)(a) – (5)(c)	(924,524,717)	(485,474,600)	664,301,847
(6)	Phased-In Recognition of Investment Income			
	(a) Current Year: (5)(d) x 0.20	(184,904,943)	(97,094,920)	132,860,369
	(b) First Prior Year	(97,094,920)	132,860,369	40,945,727
	(c) Second Prior Year	132,860,369	40,945,727	(182,178,789)
	(d) Third Prior Year	40,945,727	(182,178,789)	159,875,887
	(e) Fourth Prior Year	(182,178,789)	159,875,887	22,969,457
	(f) Total Recognized Investment Gain	(290,372,556)	54,408,274	174,472,651
(7)	Preliminary Actuarial Value End of Year: (1) + (4)(c) + (5)(c) + (6)(f)	11,922,965,860	11,389,603,128	10,584,795,257
(8)	Final Actuarial Value End of Year Using 20% Corridor: Greater of [(7) and .8 x (2)], but no more than 1.2 x (2)	11,922,965,860	11,389,603,128	10,584,795,257
(9)	Difference Between Market & Actuarial Values: (2) – (8)	$(1,286,263,215)	$(652,111,054)	$(112,228,180)
(10)	Rate of Return on Preliminary Actuarial Value	5.30%	8.46%	9.73%

* Before corridor constraints, if applicable.

** Includes receivables of: $15,989,968 at 6/30/2016, $6,158,929 at 6/30/2015 and $6,198,255 at 6/30/2014.

SCHEDULE C

SUMMARY OF RECEIPTS AND DISBURSEMENTS
(Market Value)

	YEAR ENDING		
	June 30, 2016	June 30, 2015	June 30, 2014
Receipts for the Year			
Contributions:			
Members	$ 135,028,539	$ 187,338,535	$ 144,806,616
State	1,218,966,824	1,101,007,100	1,024,371,178
Federal (Net of Transfers)	282,838,166	270,643,832	244,518,635
Subtotal	$ 1,636,833,529	$ 1,558,989,467	$ 1,413,696,429
Amount Receivable	15,989,968	6,158,929	6,198,255
Investment Earnings (net of expenses)	(17,334,272)	357,365,061	1,440,787,413
TOTAL	$ 1,635,489,225	$ 1,922,513,457	$ 2,860,682,097
Disbursements for the Year			
Benefit Payments	$ 1,729,181,426	$ 1,650,464,672	$ 1,563,029,412
Refunds to Members	7,097,228	7,123,788	7,528,594
TOTAL	$ 1,736,278,654	$ 1,657,588,460	$ 1,570,558,006
Excess of Receipts over Disbursements	$ (100,789,429)	$ 264,924,997	$ 1,290,124,091
Reconciliation of Asset Balances			
Asset Balance as of the Beginning of Year	$ 10,737,492,074	$ 10,472,567,077	$ 9,182,442,986
Excess of Receipts over Disbursements	(100,789,429)	264,924,997	1,290,124,091
Asset Balance as of the End of Year	$ 10,636,702,645	$ 10,737,492,074	$ 10,472,567,077
Rate of Return	(0.16)%	3.43%	15.82%

SCHEDULE D

OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS

Adopted or reaffirmed by the Commission for the June 30, 2016 and later valuations.

VALUATION INTEREST RATE: 6.90% per annum, compounded annually, net of expenses.

SALARY INCREASES: From the Framework Document between the State and SEBAC, we have assumed the rate of wage inflation is 0.00% for fiscal years ending June 30, 2017, 2018 and 2019 for each active member. In addition, we have reduced the rate of increase by one half due to promotion and merit over this same three-year period. Once this three-year period is complete, the assumptions for salary increases are as follows:

Years of Service	Rate*
0	9.50%
1	19.50%
2	9.50%
3	5.75%
4	5.50%
5	5.25%
6	5.00%
7	5.00%
8	5.00%
9	5.00%
10	4.50%
11	4.50%
12	4.50%
13	4.50%
14	4.50%
15+	3.50%

*includes Wage Inflation of 3.50%

COST OF LIVING ADJUSTMENTS (COLA):

Group	Rate
Pre July 1, 1980 Retirees	3.25%
July 1, 1980 – June 30, 1997 Retirees	3.00%
July 1, 1997 – October 1, 2011 Retirees	2.60%
Post October 1, 2011 Retirees	2.25%
Post July 1, 2022 Retirees	1.95%

We have also assumed a COLA moratorium for those retiring on or after July 1, 2022 for the first 30 months of retirement. We assume the first COLA received is increased by 0.15% to reflect the possible additional COLA in the event the annualized rate of increase in the CPI-W is greater than 5.5% during the first 18 months of retirement.

SOCIAL SECURITY WAGE BASE INCREASES: 3.50% per annum.

PAYROLL GROWTH ASSUMPTION: 3.50% per annum.

SEPARATIONS BEFORE SERVICE RETIREMENT: Representative values of the assumed annual rates of separation before service retirement are as follows:

WITHDRAWAL

Annual Rates of Withdrawal								
	Years of Service							
Age	0	1	2	3	4	5	6-9	10+
Hazardous Males								
20	6.00%	3.00%	6.00%	3.00%	2.75%	2.00%	1.25%	1.25%
25	6.00	3.00	6.00	3.00	2.75	2.00	1.25	1.25
30	6.00	3.00	4.00	3.00	2.75	2.00	1.25	1.25
35	6.00	3.00	4.00	3.00	2.00	2.00	1.25	1.25
40	8.75	3.00	4.00	3.50	2.00	2.50	1.25	1.25
45	8.75	4.00	4.00	3.50	2.00	2.50	1.25	1.25
50	8.75	5.50	4.00	3.50	2.00	2.50	1.25	1.25
55+	8.75	6.00	4.00	3.50	2.00	2.50	1.25	1.25
Hazardous Females								
20	10.00%	10.00%	5.00%	2.50%	3.00%	3.50%	2.50%	1.25%
25	10.00	10.00	5.00	2.50	3.00	3.50	2.50	1.25
30	12.00	6.00	5.00	2.50	3.00	3.50	2.50	1.25
35	12.00	5.00	6.00	2.50	4.00	3.50	2.50	1.25
40	12.00	5.00	6.00	2.00	4.00	3.50	2.50	1.25
45	12.00	5.00	5.00	2.00	4.00	3.50	2.50	1.25
50	12.00	8.00	5.00	2.00	4.00	3.50	2.50	1.25
55+	12.00	8.00	5.00	2.00	4.00	3.50	2.50	1.25
Nonhazardous Males								
20	45.0%	40.0%	40.0%	20.0%	20.0%	10.0%	6.0%	5.0%
25	30.0	28.0	19.0	10.0	7.0	10.0	6.0	5.0
30	22.0	20.0	14.0	9.0	6.0	7.0	4.5	5.0
35	20.0	15.0	14.0	8.0	6.0	4.0	4.0	3.0
40	20.0	15.0	10.0	8.0	6.0	4.0	4.0	2.5
45	22.0	12.0	10.0	8.0	6.0	4.0	4.0	2.0
50	22.0	12.0	10.0	8.0	5.0	4.0	4.0	2.0
55+	25.0	19.0	10.0	8.0	4.0	4.0	3.5	2.0
Nonhazardous Females								
20	45.0%	45.0%	45.0%	20.0%	8.0%	10.0%	6.0%	4.0%
25	25.0	23.0	15.0	12.0	8.0	10.0	6.0	4.0
30	20.0	19.0	12.0	9.0	7.0	6.0	5.0	4.0
35	18.0	13.0	11.0	8.0	6.0	5.0	4.0	3.0
40	18.0	13.0	10.0	8.0	5.5	4.0	3.5	2.5
45	18.0	13.0	10.0	6.0	5.5	4.0	3.0	2.5
50	18.0	13.0	10.0	6.0	5.5	4.0	3.0	2.0
55+	18.0	13.0	10.0	6.0	5.5	4.0	3.0	2.0

DISABILITY

Annual Rates of Disability		
Age	**Hazardous**	**Non-Hazardous**
30	0.05%	0.04%
35	0.12	0.05
40	0.18	0.10
45	0.35	0.12
50	0.40	0.20
55	0.50	0.40
60	0.65	0.50
65	0.80	0.60
70	1.35	0.60

RETIREMENT: The assumed annual rates of retirement are shown below.

Annual Rates of Retirement			
Hazardous			
Age	Tier I, II & IIA		Tier III
	First Year Eligible	All Years After	
40	50%	50%	20%
41	30	40	20
42	30	35	20
43	30	30	20
44	30	25	20
45	40	25	20
46	40	25	20
47	40	25	20
48	40	15	20
49	40	15	20
50	40	20	20
51	40	20	20
52	40	20	20
53	40	25	20
54	40	25	20
55	40	25	20
56	40	25	20
57	40	15	20
58	40	25	20
59	40	20	20
60-64	50	30	20
65-69	50	50	20
70-79	100	30	20
80	100	100	100

Annual Rates of Retirement									
Nonhazardous									
Age	Tier I			Tier II & IIA			Tier III		
	Early	First Year	Other Years	Early	First Year	Other Years	Early	First Year	Other Years
55	6.0%	28.0%		4.5%					
56	6.0	10.0	15.0%	4.0					
57	6.0	10.0	12.5	4.0					
58	6.0	10.0	10.0	4.0			5.0%		
59	6.0	10.0	10.0	4.0			7.0		
60		12.5	12.5	4.0	13.5%		9.0		
61		15.0	12.5	4.0	15.0	13.0%	10.0		
62		10.0	20.0		15.0	24.0	12.0		
63		35.0	15.0		15.0	15.0	12.0	32.0%	
64		45.0	10.0		15.0	15.0	12.0	30.0	30.0%
65		65.0	15.0		25.0	15.0		28.0	25.0
66		65.0	20.0		25.0	21.0		25.0	35.0
67		65.0	22.0		25.0	24.0		25.0	35.0
68		65.0	15.0		25.0	18.0		25.0	35.0
69		65.0	15.0		25.0	18.0		25.0	30.0
70		100.0	15.0		50.0	20.0		50.0	30.0
71		100.0	15.0		50.0	24.0		50.0	30.0
72		100.0	15.0		50.0	22.0		50.0	30.0
73		100.0	15.0		50.0	22.0		50.0	30.0
74		100.0	15.0		50.0	22.0		50.0	30.0
75		100.0	15.0		100.0	22.0		100.0	30.0
76		100.0	15.0		100.0	25.0		100.0	30.0
77		100.0	15.0		100.0	22.0		100.0	30.0
78		100.0	15.0		100.0	25.0		100.0	30.0
79		100.0	15.0		100.0	22.0		100.0	30.0
80		100.0	100.0		100.0	100.0		100.0	100.0

We have assumed that the assumed rate of retirement will increase by 20% of the current assumed rates in the year before July 1, 2022 to reflect the potential behavior of future eligible members to avoid the July 1, 2022 COLA change and moratorium.

DEATHS AFTER RETIREMENT: The RP-2014 White Collar Mortality Table projected to 2020 by Scale BB at 100% for males and 95% for females is used for the period after retirement and for dependent beneficiaries. Representative values of the assumed annual rates of mortality are as follows:

Age	Males	Females	Age	Males	Females
40	0.043%	0.031%	65	0.705%	0.579%
45	0.067	0.052	70	1.133	0.933
50	0.272	0.194	75	1.943	1.553
55	0.384	0.250	80	3.407	2.688
60	0.501	0.348	85	6.247	4.826

In our opinion, the projection of the mortality rates with Scale BB provide a sufficient margin in the assumed rates of mortality to allow for additional improvement in mortality experience.

The RP-2014 Disabled Retiree Mortality Table at 65% for males and 85% for females is used for the period after disability.

ASSET METHOD: Actuarial Value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected value of assets, based on the assumed valuation rate of return. The amount recognized each year is 1/5 of the difference between market value and expected actuarial value. In addition, the actuarial value of assets cannot be less than 80% or more than 120% of the market value of assets.

VALUATION METHOD: Entry Age Normal cost method. See Schedule E for a brief description of this method.

IMPACT OF LONGLEY DECISION: Benefits for members retiring from service on or after the *Longley* decision date are assumed to increase by 0.084% as a result of the revised treatment of longevity pay. Retroactive application of *Longley* has been reflected in this valuation to the extent impacted retiree benefits have been recalculated.

SPOUSES: For members who have elected spouse coverage, husbands are assumed to be three years older than their wives.

PERCENT MARRIED: 80% of active members are assumed to be married with an average of two children who are on average age 12.

OTHER ASSUMPTIONS:

- 20% of Pre-Retirement deaths are assumed to be service related,
- 50% of Tier I Hazardous Employees are assumed to be State Police,
- To take into account State Police Supplemental Benefits and the offset of Workers Compensation, Social Security, and Non-Rehabilitation Earnings, the following minimum and maximum benefits as a percent of salary are assumed for disability benefits:

	Minimum	Maximum
Tier I State Police	60%	80%
All Other Members	40%	60%

SCHEDULE E

ACTUARIAL COST METHOD

The valuation is prepared on projected benefit basis, under which the present value of each member's expected benefits at retirement or death is determined, based on age, service and sex and using the interest rate assumed to be earned in the future (6.90% per annum). The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service, disability or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members, beneficiaries and members entitled to deferred vested benefits to obtain the present value of all expected benefits payable from the System on account of the present group of members and beneficiaries.

The employer contributions required to support the benefits of SERS are determined following a level funding approach, and consist of a normal cost contribution and an unfunded actuarial accrued liability contribution. The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded actuarial accrued liability is determined by subtracting the actuarial value of assets from the actuarial accrued liability. The UAAL is amortized according to the MOU between the State and SEBAC which established separate UAAL bases. Each base is rolled forward to the beginning of the fiscal year for which the amortization payment is applicable. The amortization amounts are adjusted with interest to the middle of the applicable fiscal year. The employer required contribution amount is the sum of the normal cost contribution and the UAAL amortization payment.

SCHEDULE F

SUMMARY OF MAIN SYSTEM PROVISIONS AS INTERPRETED FOR VALUATION PURPOSES

The Connecticut State Employees Retirement System (CT SERS) is a defined benefit pension plan established by the Connecticut General Assembly for the purpose of providing retirement allowances and other benefits for State employees in Connecticut, and their survivors and other beneficiaries.

Eligibility Requirements

Tier I	All State Employees, Elected Officials and their Appointees hired prior to July 1, 1984. Those employees hired between July 1, 1982 and January 1, 1984 could elect to move to Tier II.
Tier II	All State Employees, Elected Officials and their Appointees hired on or after July 1, 1984.
Tier IIA	All State Employees, Elected Officials and their Appointees hired on or after July 1, 1997.
Tier III	All State Employees, Elected Officials and their Appointees hired on or after July 1, 2011.
Tier IV	All State Employees, Elected Officials and their Appointees hired on or after July 1, 2017.

Final Average Earnings (FAE)

Tier I, II, and IIA	Average Salary of the three highest paid years of service. Effective January 1, 1986, no one year's earnings can be greater than 130% of the average of the two preceding years in calculating the Final Average Earnings.
Tier III and IV	Average Salary of the five highest paid years of service. No one year's earnings can be greater than 130% of the average of the two preceding years in calculating the Final Average Earnings.

Normal Retirement Benefit

Eligibility

<u>Tier I Hazardous</u> – 20 years of credited service.

<u>Tier I Plans B and C</u> – Earliest of age 55 with 25 years of service, age 60 with 10 years of service, or age 70 with 5 years of service.

<u>Tier II Hazardous</u> – 20 years of credited service.

Tier II and IIA – For those who will be eligible for retirement on or before July 1, 2022, the earliest of age 62 with 10 years of vesting service (effective July 1, 1992), age 60 with 25 years of vesting service, age 70 with 5 years of vesting service, or age 62 with 5 years of actual state service for terminations on or after July 1, 1997.

For those who will not be eligible for retirement on or before July 1, 2022, the earliest of age 65 with 10 years of vesting service, age 63 with 25 years of vesting service, age 70 with 5 years of vesting service.

Tier III Hazardous – Earlier of Age 50 and 20 years of benefit service or 25 years of benefit service.

Tier III and IV – Age 63 and 25 years of benefit service or Age 65 and 10 years of benefit service.

Tier IV Hazardous – 25 years of benefit service.

Benefit

Tier I Hazardous – 50% of FAE plus 2% for each year of service in excess of 20.

Tier I Plan B – 2% of FAE times years of service up to age 65. Thereafter, 1% of FAE up to $4,800, plus 2% of FAE in excess of $4,800 times years of service. At age 70, greater of 1.25% of FAE up to $4,800 plus 2.5% of FAE in excess of $4,800 times years of service (maximum 20 years) or 1.0% of FAE up to $4,800 plus 2% of FAE in excess of $4,800 times year of service. Minimum benefit with 25 years is $833.34 per month.

Tier I Plan C – 2% of FAE times years of service. At age 70, greater of 2.5% of FAE times years of service (maximum 20 years) or 2.0% of FAE times years of service. Minimum benefit with 25 years is $833.34 per month.

Tier II,IIA, III and IV Hazardous – 2.5% of FAE times years of service up to 20 years plus 2.0% of FAE times years of service in excess of 20 years, if any. Minimum benefit with 25 years is $360 per month.

Tier II, IIA and III All Others – 1.40% of FAE plus 0.433% of FAE in excess of year's breakpoint*, times years of service from October 1, 1982 up to 35 years plus 1.625% of FAE times years of service in excess of 35 years, if any. Minimum benefit with 25 years if $360 per month.

* $10,700 increased by 6% each year after 1982, rounded to nearest $100 but not greater than Social Security Covered Compensation.

Tier IV All Others – 1.30% of FAE times years of service. Minimum benefit with 25 years if $360 per month.

Early Retirement Benefit

Eligibility	*Hazardous* – None.
	Tier I – Age 55 with 10 years of service.
	Tier II and IIA – Age 55 with 10 years of service.
	Tier III and IV – Age 58 with 10 years of service.
Benefit	*Tier I* – Benefit is Normal Retirement Benefit reduced for retirement prior to age 60 with less than 25 years of service.
	Tier II, IIA, III and IV – Benefit is Normal Retirement Benefit reduced 0.25% (effective July 1, 1991) for each month prior to age 60 if at least 25 years of service or age 62 if at least 10 but less than 25 years of service.
	For those who retire on or after October 2, 2011 but prior to meeting the age and service requirements for a normal retirement, will be subject to a benefit reduced by 0.50% for each month prior to Normal Retirement.

Disability Retirement Benefit

Tier I	For non-service disabilities occurring prior to age 60 with at least 5 years of service, benefit is 3% of FAE times years of service; maximum benefit is 1.667% of FAE times year of service projected to age 65.
	For service disabilities occurring prior to age 60, benefit is 1.667% of Salary times years of service projected to age 65 (maximum 30 years).
	Exception: State Police benefit is equal to the normal retirement benefit if more than 20 years of service. State Police also receives an additional benefit of $360 per month plus $300 to spouse plus $300 to a surviving dependent child.
Tier II, IIA, III and IV	Prior to age 65 for service related disability or at any age with at least 10 years of service, benefit is 1.333% of FAE plus 0.50% of FAE in excess of the year's breakpoint, times service projected to age 65 (maximum 30 years).

Deferred Vested Retirement Benefit

Eligibility	<u>*Tier I*</u> - 10 years of service. <u>*Tier II and IIA*</u> – Effective July 1, 1997, 5 years of actual state service, 10 years of vesting service, or age 70 with 5 years of service. <u>*Tier III and IV*</u> – 10 years of benefit service.
Benefit	<u>*Tier I*</u> – Benefit is payable at Normal Retirement Age or an Early Retirement Benefit is payable at age 55. <u>*Tier II and IIA*</u> – Benefit is payable at Normal Retirement Age or an Early Retirement Benefit is payable at age 55. <u>*Tier III and IV*</u> – Benefit is payable at Normal Retirement Age or an Early Retirement Benefit is payable at age 58.

Pre-Retirement Spouse's Benefit

Tier I	State Police – Survivor benefits to spouse of $670 per month plus $300 to a surviving dependent child. If eligible for early or normal retirement, 50% of the average of the Life Benefit and the 50% Joint & Survivor Benefit the member would have received. If not eligible for retirement but with 25 years of service, the same benefit calculated as though age 55 using service and earnings at death. If not eligible for retirement, return of contributions (5% interest).
Tier II, IIA, III and IV	If eligible for early or normal retirement, 50% of the 50% Joint & Survivor Benefit the member would have received. If not eligible for retirement but with 25 years of service, the same benefit calculated as though age 55 using service and earnings at death. If not eligible for retirement, return of contributions (5% interest).
Tiers I, II, IIA, III and IV	If death is due to employment and there are dependent children under age 18, spouse will be paid $100,000 in 10 annual installments while living and not remarried. In addition, $50 per month will be paid to each child while under age 18. If death is due to employment and there are no dependent children under age 18, spouse will be paid $50,000 in not less than 10 annual installments.

Payment Options

50% or 100% Joint and Survivor (Normal Form if married).
Straight life annuity (Normal Form if not married).
10 or 20 year certain and life annuity.

Cost of Living Adjustments (COLA)

Annual adjustments each July 1 of up to 5% for retirements prior to July 1, 1980; 3% for retirements after July 1, 1980. For members (and beneficiaries) not covered by Social Security and age 62 and over, the maximum increase is 6%.

For employees retiring after June 30, 1999, the annual adjustment will be 60% of the increase in CPI up to 6% and 75% of the increase in the CPI over 6%. This adjustment will be no less than 2.5% and no greater than 6%.

Employees retiring between July 1, 1997 and June 30, 1999 made an irrevocable choice between the above formula and a fixed 3% annual adjustment.

An employee from Tier IIA must have at least 10 years of actual state service or directly make the transition into retirement in order to be eligible for annual adjustments.

For employees retiring on or after October 2, 2011, the minimum COLA shall be 2.0% and the maximum COLA shall be 7.5%.

For employees retiring on or after July 1, 2022, the annual rate of increase will be the CPI-W from 0.00% to 2.00%, plus 60% of the annual rate of increase in CPI-W from 3.33% to 6.00%, plus 75% of the annual rate of increase in CPI-W above 6.00%, with a cap on the COLA rate of 7.50%. In addition, a COLA moratorium for those retiring on or after July 1, 2022 will be on the first 30 months of retirement. If rate of increase in CPI-W exceeds an annualized rate of 5.5% during the initial 18 month period of receiving retirement benefits, the COLA provided beginning with the 31st monthly benefit includes an additional adjustment based on the annual COLA rate as determined above using the annualized rate over the 18 month period. The COLA rate applied would but reduced by 2.5% and then multiplied by 1.5 to reflect the 18 month period.

Member Contributions*

Tier I – Hazardous	4% of earnings up to Social Security Taxable Wage Base plus 5% of earnings above that level.
Tier I – Plan B	2% of earnings up to Social Security Taxable Wage Base plus 5% of earnings above that level.
Tier I – Plan C	5% of earnings.
Tier II – Hazardous	4% of earnings.
Tier II – All Others	None.
Tier IIA & III – Hazardous	5% of earnings.
Tier IIA & III – All Others	2% of earnings.
Tier IV – Hazardous	8% of earnings.
Tier IV – All Others	5% of earnings.

* Increased for anyone electing to maintain retirement eligibility. In addition, there will be an increase to all non-Tier IV members contribution rates by 1.5% of earnings effective July 1, 2017 and an additional 0.5% of earnings effective July 1, 2019. In years where asset losses require further increases in contributions, Tier IV employees' contributions may increase by half the necessary increase in rates (up to 2.0%). Finally, all Tier IV employees must contribute 1% to the Defined Contributions (DC) portion of the Hybrid Plan and may elect additional contribution of up to 3% of salary to the DC portion.

Hybrid Defined Benefit/Defined Contribution Plan for Employees of Higher Learning

Individuals hired on or after July 1, 2011 otherwise eligible for the Alternate Retirement Plan ("ARP") shall be eligible to be members of the new Hybrid Plan in addition to their existing choices. Individuals who are currently members of the ARP shall be eligible to join the Hybrid Plan on a one time option at the full actuarial cost. The Hybrid Plan shall have defined benefits identical to Tier II/IIA and Tier III for individuals hired on or after July 1, 2011, but shall require employee contributions 3% higher than the contribution required from the Applicable Tier II/IIA/III Plan. An employee shall have the option, upon leaving state service, of accepting the defined benefit amount, or electing to receive a return of his/her contributions to the Hybrid Plan, plus a 5% employer match, plus 4% interest ("cash out option"). In the event the employee elects the cash out option, he/she shall permanently waive any entitlement they may have to health insurance as a retired state employee unless they convert the cash out option to a periodic payment as would be required under the current ARP Plan.

SCHEDULE G

TABLES OF MEMBERSHIP DATA

STATUS RECONCILIATION OF ACTIVE MEMBERS

	Total
As of June 30, 2014	49,976
Retirements	(3,665)
Disability	(291)
Terminated Vested	(95)
Terminated Non-Vested	(33)
Deaths	(74)
Rehires	645
New Participants	6,864
Refunds	(3,308)
As of June 30, 2016	50,019

STATUS RECONCILIATION OF INACTIVE MEMBERS

	Retirees	Disability	Survivor	Deferred Vested	Total
As of June 30, 2014	37,158	4,092	4,553	1,457	47,260
Retirements	185	(9)		(176)	0
Disability	(3)	3			0
Survivors	(403)	(41)	444		0
Deaths with no Survivors	(75)	(7)	(11)	(1)	(94)
Rehires	(3)	(2)		(15)	(20)
Refunds					0
Certain Period Ended			(7)		(7)
Data Corrections	(1,337)	(95)	(258)	52	(1,638)
From Active	3,665	291	51	95	4,102
As of June 30, 2016	39,187	4,232	4,772	1,412	49,603

SCHEDULE G
(Continued)

TIER I – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees By Age and Service as of June 30, 2016

Age	Years of Service							Total	
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39									0
40 to 44									0
45 to 49									0
50 to 54			1				3	4	372,790
55 to 59		1	3	1		1	11	17	1,759,003
60 to 64							13	13	1,617,275
65 to 69							1	1	118,247
70 & Up									
Total		1	4	1		1	28	35	$ 3,867,315

Average Age: 58.7
Average Service: 31.9

Average Salary: $110,495

SCHEDULE G
(Continued)

TIER I – PLAN B

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39									0
40 to 44									0
45 to 49									0
50 to 54	1	3	3	6	8	5	202	228	19,198,519
55 to 59	2	6	6	15	11	18	537	595	54,922,664
60 to 64	1	5	4	9	13	13	353	398	41,276,362
65 to 69		1	1	2	3	5	122	134	15,305,215
70 & Up	1	1	1				70	73	9,589,761
Total	5	16	15	32	35	41	1,284	1,428	$ 140,292,521

Average Age: 59.5
Average Service: 34.6

Average Salary: $98,244

SCHEDULE G
(Continued)

TIER I – PLAN C

The Number and Average Annual Compensation of Active Employees By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39									0
40 to 44									0
45 to 49									0
50 to 54							8	8	741,694
55 to 59					1		13	14	1,162,566
60 to 64			1			1	9	11	1,053,124
65 to 69	1						6	7	551,963
70 & Up				1			4	5	557,838
Total	1		1	1	1	1	40	45	$ 4,067,185

Average Age: 61.1
Average Service: 34.4

Average Salary: $90,382

SCHEDULE G
(Continued)

TIER II – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39			2	6				8	667,248
40 to 44	1	1	4	90	63	2		161	15,829,465
45 to 49	5	3	9	127	337	64	4	549	55,951,249
50 to 54	2	3	8	68	188	142	19	430	45,071,640
55 to 59	2		7	32	89	46	29	205	20,090,596
60 to 64	1			22	48	22	14	107	10,373,088
65 to 69				12	14	9	5	40	4,207,198
70 & Up				3	5	4		12	1,072,057
Total	11	7	30	360	744	289	71	1,512	$ 153,262,541

Average Age: 51.0
Average Service: 22.5

Average Salary: $101,364

SCHEDULE G
(Continued)

TIER II – ALL OTHERS

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39	1	1	8	14	1			25	1,734,561
40 to 44	7	8	18	115	149	3		300	24,569,272
45 to 49	41	35	60	253	946	540	39	1,914	165,537,180
50 to 54	44	56	80	253	872	1,547	634	3,486	312,135,229
55 to 59	29	44	76	177	727	1,218	751	3,022	272,530,964
60 to 64	22	27	51	138	465	652	348	1,703	154,062,902
65 to 69	11	13	22	40	170	199	106	561	49,933,159
70 & Up	6	5	7	23	62	65	25	193	14,848,597
Total	161	189	322	1,013	3,392	4,224	1,903	11,204	$ 995,351,864

Average Age: 54.9
Average Service: 24.9

Average Salary: $88,839

SCHEDULE G
(Continued)

TIER IIA – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	1							1	$ 56,317
25 to 29	10	56	2					68	4,406,410
30 to 34	21	629	127	1				778	56,600,756
35 to 39	24	493	515	166	1			1,199	94,377,198
40 to 44	7	315	407	549	51	1		1,330	115,091,374
45 to 49	8	242	314	519	40	2		1,125	96,835,384
50 to 54	7	155	220	281	16	1		680	56,966,848
55 to 59	1	99	142	191	7	8		448	38,162,788
60 to 64	1	34	58	106	1	3	1	204	17,054,442
65 to 69		5	30	45	5			85	7,289,222
70 & Up		2	5	30	2			39	2,859,943
Total	80	2,030	1,820	1,888	123	15	1	5,957	$ 489,700,682

Average Age: 44.0
Average Service: 12.5

Average Salary: $82,206

SCHEDULE G
(Continued)

TIER IIA – ALL OTHERS

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

Age	Years of Service							Total	
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	18	2						20	$ 268,190
25 to 29	81	155	7					243	12,540,189
30 to 34	128	915	217	6				1,266	79,369,221
35 to 39	124	966	775	196	1			2,062	142,186,300
40 to 44	92	842	796	776	5			2,511	185,360,057
45 to 49	89	859	835	836	7	4		2,630	194,160,857
50 to 54	101	792	815	788	7	4		2,507	183,080,846
55 to 59	100	740	726	724	10	3		2,303	168,620,263
60 to 64	70	501	547	463	14		1	1,596	117,158,089
65 to 69	48	189	242	187	5			671	46,159,364
70 & Up	56	74	65	56	3			254	12,868,435
Total	907	6,035	5,025	4,032	52	11	1	16,063	$ 1,141,771,811

Average Age: 48.4
Average Service: 11.3

Average Salary: $71,081

SCHEDULE G
(Continued)

TIER III – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	90							90	$ 4,498,608
25 to 29	783	17						800	47,096,659
30 to 34	657	17	2		1			677	41,949,985
35 to 39	402	13	4					419	25,953,792
40 to 44	195	6						201	12,606,332
45 to 49	158	5	4	1				168	10,727,961
50 to 54	112				1		1	114	7,856,772
55 to 59	48							48	3,138,128
60 to 64	26	1			1			28	1,922,009
65 to 69	3							3	517,254
70 & Up	3							3	259,387
Total	2,477	59	10	1	3		1	2,551	$ 156,526,887

Average Age: 34.4
Average Service: 2.5

Average Salary: $61,359

SCHEDULE G
(Continued)

TIER III – HYBRID PLAN

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	17							17	$ 614,671
25 to 29	86							86	4,504,099
30 to 34	124	9	2					135	7,281,495
35 to 39	122	23	16	3				164	10,550,526
40 to 44	98	34	39	29	4			204	15,647,042
45 to 49	102	31	73	62	19	12	1	300	27,003,456
50 to 54	57	26	67	75	37	26	12	300	27,907,979
55 to 59	56	38	81	88	62	44	25	394	38,911,004
60 to 64	28	13	56	76	59	53	24	309	33,251,200
65 to 69	11	8	31	18	18	30	27	143	17,776,128
70 & Up	4	1	5	6	5	6	8	35	3,791,227
Total	705	183	370	357	204	171	97	2,087	$ 187,238,827

Average Age: 50.4
Average Service: 12.7

Average Salary: $89,717

SCHEDULE G
(Continued)

TIER III – ALL OTHERS

The Number and Average Annual Compensation of Active Employees By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	921	6						927	$ 15,277,954
25 to 29	1,552	4						1,556	70,131,138
30 to 34	1,578	10	1					1,589	83,271,627
35 to 39	1,184	8	5					1,197	68,909,620
40 to 44	930	7	3	2				942	54,857,538
45 to 49	938	10	7			2	2	959	53,609,357
50 to 54	826	5	6	2		1	1	841	45,905,126
55 to 59	565	5	3				1	574	31,616,481
60 to 64	340	7		1		1	1	350	16,684,887
65 to 69	141		1					142	6,339,608
70 & Up	57	2					1	60	2,068,460
Total	9,032	64	26	5		4	6	9,137	$ 448,671,796

Average Age: 38.7
Average Service: 2.3

Average Salary: $49,105

SCHEDULE G
(Continued)

NUMBER OF RETIRED MEMBERS AND THEIR BENEFITS BY AGE

Age	Number	Total Annual Benefits	Average Annual Benefits
Under 50	1,239	$ 55,593,013	$ 44,869
50 – 54	1,862	88,515,722	47,538
55 – 59	3,812	154,180,789	40,446
60 – 64	6,856	284,115,686	41,440
65 – 69	8,886	344,567,896	38,776
70 – 74	7,585	282,108,260	37,193
75 – 79	5,089	179,244,473	35,222
80 – 84	3,761	125,471,368	33,361
85 – 89	2,645	82,549,702	31,210
90 – 94	1,268	33,216,343	26,196
95 & Over	416	10,332,057	24,837
Total	43,419	$ 1,639,895,309	$ 37,769

NUMBER OF BENEFICIARIES AND THEIR BENEFITS BY AGE

Age	Number	Total Annual Benefits	Average Annual Benefits
Under 50	301	$ 6,256,978	$ 20,787
50 – 54	114	2,560,844	22,464
55 – 59	206	5,336,544	25,906
60 – 64	327	8,761,878	26,795
65 – 69	480	12,464,556	25,968
70 – 74	610	14,633,490	23,989
75 – 79	700	15,499,467	22,142
80 – 84	748	15,620,978	20,884
85 – 89	700	13,639,725	19,485
90 – 94	446	8,831,009	19,800
95 & Over	140	2,284,325	16,317
Total	4,772	$ 105,889,794	$ 22,190

<u>SCHEDULE G</u>
(Continued)

NUMBER OF DEFERRED VESTED MEMBERS AND THEIR BENEFITS BY AGE

Age	Number	Total Annual Benefits	Average Annual Benefits
Under 50	493	$ 6,129,543	$ 12,4331
50 – 54	535	9,027,565	16,874
55 – 59	249	3,655,870	14,682
60 – 64	108	1,232,114	11,408
65 – 69	20	201,705	10,085
70 – 74	6	57,475	9,579
75 – 79	1	11,808	11,808
80 – 84	0	0	0
85 – 89	0	0	0
90 – 94	0	0	0
95 & Over	0	0	0
Total	1,412	$ 20,316,080	$ 14,388

SCHEDULE H

ANALYSIS OF FINANCIAL EXPERIENCE

Gains & Losses in Accrued Liabilities Resulting from Difference Between Assumed Experience & Actual Experience ($ Millions)

Type of Activity	$ Gain (or Loss) For Two Year Period Ending 6/30/2016
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	$ (343.3)
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	(55.8)
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	(24.9)
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(1.8)
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(203.3)
New Members. Additional unfunded accrued liability will produce a loss.	(282.8)
Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.	(232.5)
Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.	(65.9)
Other. Miscellaneous gains and losses resulting from changes in valuation software, data adjustments, timing of financial transactions, etc.	181.1
Gain (or Loss) During Year From Financial Experience	$ (1,029.2)
Non-Recurring Items. Adjustments for plan amendments, assumption changes, or method changes.	(4,612.3)
Composite Gain (or Loss) During Year	$ (5,641.5)

SCHEDULE I

ACTUARIAL SURPLUS TEST

Section 5-162(h) of the General Statutes of Connecticut provides that the Retirement Commission may grant additional Cost-of-Living Adjustments (COLAs) for retired members if an actuarial surplus exists. An actuarial surplus is deemed to exist if three criteria are met.

I. ***Investment Income:*** The actual rate of return for the Fiscal Year ending on the valuation date must exceed the actuarial interest rate assumption.

Market Value of Assets on June 30, 2015: (A)	$10,737,492,074
Market Value of Assets on June 30, 2016: (B)	$10,636,702,645
Investment Income for FY 2015-2016: (I)	$(17,334,272)
Actual Rate of Return for FY 2015-2016: 2I / (A + B – I)	(0.16)%
Actuarial Interest Rate Assumption:	8.00%

Actual return of (0.16)% is less than the assumed 8.00%, so the first criterion is not met.

II. ***Assets vs. Liabilities:*** Market value of assets must exceed 50% of specified liabilities.

Market Value of Assets on June 30, 2016:	$10,636,702,645
Specified Liabilities on June 30, 2016:	
Liability for Retired Members	$22,664,892,602
Liability for Terminated Vested Members	$266,708,800
Liability for Member Contributions with Interest	$1,091,811,686
Total	$24,023,413,088
50% of Specified Liabilities	$12,011,706,544

Market Value does not exceed 50% of specified liabilities so the second criterion is not met.

III. ***Unfunded Liability***: Actual unfunded liability must be less than the projected unfunded liability five years from the determination date.

Actual Unfunded Liability on June 30, 2016:	$20,387,369,150
Projected Unfunded Liability on June 30, 2021 (see next page):	$8,804,428,000

Actual Unfunded Liability is not less than Projected Unfunded Liability so the third criterion is not met and therefore, no actuarial surplus exists.

SCHEDULE I
(continued)

ACTUARIAL SURPLUS TEST
PROJECTION OF UNFUNDED LIABILITY

Section 5-162-h(b)(2) of the General Statutes of Connecticut specifies the means of calculating the Projected Unfunded Liability used in the third criterion of the Actuarial Surplus Test. The projection reflects the actual unfunded liability as of December 31, 1983 adjusted for changes in actuarial assumptions and cost methods through the determination date. No provision is made in the Statute for reflecting the impact of plan changes. The projection below reflects the following changes: data correction (June 30, 1987); change in actuarial assumptions (June 30, 1987); change in actuarial cost method (June 30, 1988); change in actuarial assumptions - interest rate only (June 30, 1989); change in actuarial cost method – amortization period only (June 30, 1992); change in actuarial assumptions (June 30, 1993); change in actuarial cost method – level percent amortization (June 30, 1997); change in actuarial methods and assumptions (June 30, 2000); change in actuarial assumptions (June 30, 2004); change in actuarial assumptions (June 30, 2008); change in actuarial assumptions (June 30, 2012) change in actuarial assumptions (June 30, 2016).

Year	($000) June 30 Unfunded Liability	Year	($000) June 30 Unfunded Liability	Year	($000) June 30 Unfunded Liability
1987	$2,524,556	2002	$2,360,589	2017	$9,951,987
1988	1,954,257	2003	2,429,273	2018	9,659,917
1989	1,432,333	2004	2,502,591	2019	9,424,079
1990	1,939,758	2005	2,569,504	2020	9,140,386
1991	1,930,524	2006	2,634,814	2021	8,804,428
1992	1,920,505	2007	2,698,021	2022	8,411,458
1993	1,794,192	2008	2,823,251	2023	7,956,355
1994	1,787,586	2009	2,861,884	2024	7,433,609
1995	1,780,419	2010	2,895,933	2025	6,837,282
1996	1,772,643	2011	2,924,709	2026	6,160,985
1997	1,764,205	2012	4,160,465	2027	5,397,841
1998	1,835,087	2013	4,172,971	2028	4,540,451
1999	1,907,249	2014	4,174,465	2029	3,580,857
2000	2,222,296	2015	4,163,616	2030	2,510,500
2001	2,291,494	2016	10,057,733	2031	1,320,178
				2032	0

SCHEDULE J

PROJECTION OF UNFUNDED ACCRUED LIABILITY

Valuation Year	Unfunded Accrued Liability ($ in thousands)	Amortization Payment ($ in thousands)
2016	$ 20,387,369	$ 1,289,045
2017	20,568,774	1,180,377
2018	20,916,059	1,328,832
2019	21,266,590	1,488,666
2020	21,378,865	1,641,447
2021	21,155,930	1,774,968
2022	20,779,484	1,895,021
2023	20,252,870	1,895,021
2024	19,689,918	1,895,021
2025	19,088,124	1,895,021
2026	18,444,805	1,895,021
2027	17,757,097	1,895,021
2028	17,021,938	1,895,021
2029	16,236,052	1,895,021
2030	15,395,941	1,895,021
2031	14,497,861	1,895,021
2032	13,537,814	1,436,465
2033	12,985,897	1,436,465
2034	12,395,901	1,436,465
2035	11,765,195	1,436,465
2036	11,090,971	1,436,465
2037	10,370,225	1,436,465
2038	9,599,747	1,436,465
2039	8,776,107	1,436,465
2040	7,895,635	1,436,465
2041	6,954,411	1,436,465
2042	5,948,242	1,427,078
2043	4,882,351	1,414,407
2044	3,756,023	1,390,832
2045	2,576,392	1,375,545
2046	1,331,168	1,375,545
2047	0	