

State Teachers Retirement System of Ohio

Retiree Health Care Benefits Plan

Actuarial Valuation and GASB 74 and 75 Report as of July 1, 2018

Produced by Cheiron

October 2018

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**STATE TEACHERS RETIREMENT SYSTEM OF OHIO
ACTUARIAL VALUATION AND GASB 74/75 REPORTING
FOR JUNE 30, 2018 MEASUREMENT DATE**

SECTION I – VALUATION SUMMARY

The State Teachers Retirement System of Ohio has engaged Cheiron to provide an analysis of its postemployment benefit liabilities as of July 1, 2018. The primary purposes of performing this actuarial valuation are to:

- Estimate the Actuarially Determined Contribution (ADC) and the Net OPEB Liability (NOL) of the retiree health benefits using GASB 74 and 75 methodology under the current funding strategy,
- Provide disclosures for financial statements, and
- Provide projections for ADC, Net OPEB Liability (NOL), and actuarial liabilities.

We have determined costs, liabilities, and trends for the substantive plan using actuarial assumptions and methods that we consider reasonable.

GASB’s OPEB Requirements

GASB’s Statement 74 refers to the financial reporting for postemployment benefit plans other than pension plans, and Statement 75 refers to the employer accounting for these plans. Statement 74 is generally applicable where an entity has a separate trust or fund for OPEB benefits. We understand that the State Teachers Retirement System (STRS) has a trust used to fund future OPEB obligations. The GASB No. 74 Statements are effective for the plan year ending June 30, 2017. The GASB 74 and 75 valuation sections are provided below.

Statement 75, which was adopted in the fiscal year ending (FYE) June 30, 2018, requires the employer to book the actuarial cost (net of employee, retiree, and their dependents’ contributions) of the plan as an expense on its financial statements. Additional disclosures required by GASB 74 and 75 include a description of the substantive plan, summary of significant accounting policies (which we have not included in this report), contributions, and a statement of funding progress, along with the methods and assumptions used for these disclosures.

Funding Policy

The State Teachers Retirement System of Ohio has a funding policy to contribute the Actuarially Determined Contribution (ADC). For this purpose, the ADC is calculated as the normal cost determined under the Entry Age Normal Actuarial Cost Method, plus the amortization of the unfunded actuarial liability over a 30-year open level percent of pay, plus anticipated administrative expenses. Currently, the ADC is negative and is projected to remain negative, thus the employer is not expected to make any future contributions to the Health Fund.

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SECTION I – VALUATION SUMMARY

Table I-1 below summarizes the June 30, 2018 and January 1, 2018 actuarial valuation results. The prior valuation as of January 1, 2018 was performed by the prior actuary.

Table I-1 Summary of Key Valuation Results		
Valuation Date	June 30, 2018	January 1, 2018
Discount Rate	7.45%	7.45%
Actuarial Liability		
Current retirees, beneficiaries, and dependents	\$ 1,327,565,127	\$ 1,636,026,198
Current active members	784,921,397	777,500,474
Terminated members entitled but not yet eligible	1,964,582	2,423,642
Total Actuarial Liability	\$ 2,114,451,106	\$ 2,415,950,314
Health care fund assets	3,721,348,874	3,691,398,552
Unfunded actuarial liability (UAL)	\$ (1,606,897,768)	\$ (1,275,448,238)
Funded Ratio	176.00%	152.79%

The Total Actuarial Liability decreased from \$2.42 billion under the valuation performed by the prior actuary to \$2.11 billion under this valuation. In addition to the expected decrease in liability of \$15.9 million due to normal cost, benefit payments and interest, the plan experienced other changes in liability attributable to a \$5.4 million increase due to the change in actuary, \$89.6 million increase due to benefit changes, \$53.4 million increase due to population changes, and a \$434.0 million decrease due to changes in assumptions and benefits. Statute changes to the Employer Group Waiver Program (EGWP) providing Rx benefits to Medicare retirees resulted in an increase in discounts receivable by the Plan, therefore a decrease in the projected claims costs for Medicare Rx. Lower projected trends are also a driver to the decrease in the Total Actuarial Liability.

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The Actuarially Determined Contribution (ADC), calculated in Table I-2 below, is the recommended contribution to the Retiree Health Care Plan for the reporting period, determined in conformity with Actuarial Standards of Practice. The State Teachers Retirement System of Ohio has elected to define the ADC in a manner consistent with the Annual Required Contribution under the previous GASB 43 accounting rules. The ADC calculation consists of adding the Normal Cost of the Plan to an amortization of the unfunded liability. The Normal Cost and Actuarial Liability are determined using a 7.45% discount rate, and the unfunded liability (if any) is amortized using an open 30-year amortization period calculated as a level percent of payroll. The ADC for June 30, 2018 and June 30, 2019 was calculated to be zero due to the Plan being over 100% funded.

Table I-2		
Calculation of Actuarially Determined Contribution (ADC)		
(\$ thousands)		
For Fiscal Year Ending	June 30, 2019	June 30, 2018
Normal cost	\$25,934	\$27,137
Amortization of UAL	(82,300)	(76,169)
Interest adjustment	(4,199)	N/A
Total ADC (not less than \$0)	\$0	\$0
Projected payroll	\$ 11,186,344	\$ 10,685,759
ADC as a percentage of pay	0.00%	0.00%
Expected/Actual Net Benefit Payments	\$ 195,601	\$ 186,395

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Table I-3 shows a reconciliation of the Actuarial Liability from the prior valuation to this valuation. During the replication process, we were able to match the January 1, 2018 valuation results to within less than 0.1%. The replication came in just over the liability by \$5.4 million.

Table I-3 Reconciliation of Actuarial Liability (\$ thousands)		
Actuarial Liability at January 1, 2018	\$	2,415,950
Normal Cost - half year		13,090
Expected Benefits paid throughout the year		(117,339)
Interest		88,296
Expected Actuarial Liability at June 30, 2018	\$	2,399,997
Actuarial Liability at June 30, 2018		2,114,451
Gain or (Loss)	\$	285,546
Gain or (Loss) due to:		
Change due to actuary	\$	(5,376)
Benefit changes		(89,645)
Census changes		(53,430)
Change in claims and trend assumptions		433,997
Total changes	\$	285,546

Change due to actuary: refers to the change in actuaries and how close we were to the prior actuary's results during our replication process.

Benefit changes: refers to the change in the 2019 subsidy percentage and base amount for non-Medicare participants, from 1.9% per year, to 1.944% per year, max 30 years. In addition, the Part B monthly reimbursement was extended to expire on January 1, 2020, instead of January 1, 2019.

Census changes: refers to the change in population and how it impacts the valuation results. The updated census with trended claims provided a small loss to the Plan.

Change in claims and trends assumptions: refers to the change in claim curves and trend assumptions. Claims were updated to reflect the current market and pharmacy reimbursements. The trends were blended to include projected future reimbursements from the pharmacy providers.

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SECTION I – VALUATION SUMMARY

Table I-4 below summarizes the assets for the OPEB Trust as of June 30, 2018 and June 30, 2017. The actual return on assets for the period ending June 30, 2018 was 9.51%, which was more than the assumed rate of 7.45%.

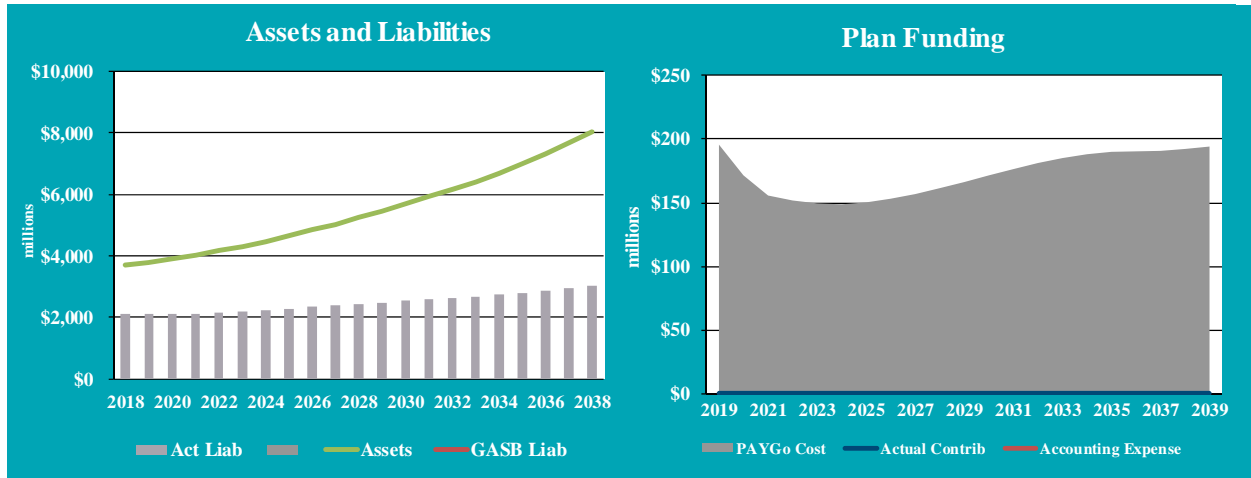
Table I-4 Reconciliation of OPEB Assets		
Fiscal Year Ending	June 30, 2018	June 30, 2017
Additions		
Contributions received		
Employer	\$ 0	\$ 0
Government reimbursements	107,196,892	79,357,248
Benefit recipient healthcare premiums	329,305,112	339,056,096
Total contributions	\$ 436,502,004	\$ 418,413,344
Net investment income	328,965,000	440,195,838
Total Additions	\$ 765,467,004	\$ 858,609,182
Deductions		
Benefit Payments	\$ 517,469,531	\$ 565,961,758
Administrative expense	2,427,509	2,496,445
Other	0	0
Total Deductions	\$ 519,897,040	\$ 568,458,203
Net increase in net position	\$ 245,569,964	\$ 290,150,979
Net position restricted to OPEB		
Beginning of Year	\$ 3,475,778,910	\$ 3,185,627,931
End of Year	\$ 3,721,348,874	\$ 3,475,778,910
Asset return for the year	9.51%	14.07%

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Projected Trends

Looking beyond 2018, the charts below project the assets and liabilities and the funding costs for the next 20 years. The projection below assumes the Plan contributes the ADC (normal cost plus the amortization of the unfunded liability) when the amount is greater than \$0.



The left-hand chart shows the projected actuarial liability (grey bars) increasing from \$2.11 billion to almost \$3.02 billion over the next 20 years. The red line on the same chart projects the GASB liability (i.e., the figure that appears on the employer’s financial statements). As of June 30, 2018, this number is the Net OPEB Liability (NOL), or the unfunded liability with adjustments, which is currently less than \$0 and projected to remain less than \$0 over the next 20 years. The green line projects the assets in the Plan increasing from \$3.72 billion to approximately \$8.03 billion. The funding percentage is expected to grow from 176% to 266% over the next 20 years.

The right-hand chart shows the annual costs. Benefit payments, net of retiree contributions, are shown by the grey area and are projected from \$196 million dropping to a low of \$149 million and climbing back up to \$194 million. The blue line represents the System’s assumed contributions to the Trust. Under actuarial funding, they are the Actuarially Determined Contributions (ADC). Currently, the ADC is projected to remain below zero over the next 20 years, thus not shown in the graph above. The accounting expense is the change in the unfunded liability plus the change in deferred outflows/inflows plus the employer contributions. The accounting expense, shown by the red line, is projected to remain below zero over the next 20 years.

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Table I-5 below summarizes the expected fiduciary net position and total expected net benefit payments for the next 30 years. The projection below is used to determine the discount rate assuming the STRS Ohio continues to not make contributions into the Health Fund assets. Based on these assumptions, the OPEB Plan’s fiduciary net position is projected to be available to make all projected future benefit payments of current plan members.

Table I-5 Expected Fiduciary Net Position and Net Benefit Payments (\$ thousands)								
Fiscal Year Ending June 30	Projected Beginning Fiduciary Net Position (a)	Projected Contributions (b)	Projected Net Benefits Retirees (c)	Projected Net Benefits Future Retirees (d)	Projected Total Net Benefits (e) = (c) + (d)	Projected Administrative Expenses (f)	Projected Investment Earnings & Government Reimbursements (g)	Projected Ending Fiduciary Net Position (h) = (a) + (b) - (e) - (f) + (g)
2018	\$ 3,475,779				\$ 188,164	\$ 2,428	\$ 436,162	\$ 3,721,349
2019	\$ 3,721,349	\$ 0	\$ 187,083	\$ 8,518	\$ 195,601	\$ 2,500	\$ 269,994	\$ 3,793,242
2020	3,793,242	0	154,479	17,037	171,516	2,575	276,228	3,895,379
2021	3,895,379	0	131,153	24,523	155,676	2,652	284,414	4,021,465
2022	4,021,465	0	120,160	31,692	151,852	2,732	293,944	4,160,825
2023	4,160,825	0	111,210	38,345	149,555	2,814	304,408	4,312,864
2024	4,312,864	0	105,356	43,477	148,833	2,898	315,758	4,476,891
2025	4,476,891	0	101,469	48,864	150,333	2,985	327,920	4,651,493
2026	4,651,493	0	99,006	54,281	153,287	3,075	340,816	4,835,947
2027	4,835,947	0	97,319	59,691	157,010	3,167	354,419	5,030,189
2028	5,030,189	0	96,271	65,419	161,690	3,262	368,715	5,233,952
2029	5,233,952	0	95,600	70,980	166,580	3,360	383,713	5,447,725
2030	5,447,725	0	95,312	76,531	171,843	3,461	399,443	5,671,864
2031	5,671,864	0	94,698	82,177	176,875	3,565	415,953	5,907,377
2032	5,907,377	0	93,751	87,852	181,603	3,672	433,322	6,155,424
2033	6,155,424	0	92,308	93,307	185,615	3,782	451,651	6,417,678
2034	6,417,678	0	90,341	98,326	188,667	3,895	471,073	6,696,189
2035	6,696,189	0	87,900	102,605	190,505	4,012	491,750	6,993,422
2036	6,993,422	0	85,094	105,781	190,875	4,132	513,876	7,312,291
2037	7,312,291	0	81,928	109,397	191,325	4,256	537,611	7,654,321
2038	7,654,321	0	78,447	114,351	192,798	4,384	563,034	8,020,173
2039	8,020,173	0	74,706	119,951	194,657	4,516	590,217	8,411,217
2040	8,411,217	0	70,740	125,018	195,758	4,651	619,305	8,830,113
2041	8,830,113	0	66,568	130,702	197,270	4,791	650,452	9,278,504
2042	9,278,504	0	62,261	135,654	197,915	4,935	683,828	9,759,482
2043	9,759,482	0	57,853	139,308	197,161	5,083	719,683	10,276,921
2044	10,276,921	0	53,417	143,309	196,726	5,235	758,243	10,833,203
2045	10,833,203	0	48,978	147,460	196,438	5,392	799,690	11,431,063
2046	11,431,063	0	44,589	152,136	196,725	5,554	844,215	12,072,999
2047	12,072,999	0	40,292	156,901	197,193	5,721	892,016	12,762,101
2048	12,762,101	0	36,141	161,110	197,251	5,893	943,345	13,502,302

Government reimbursements are not assumed to continue in the projection above. The expected return on the fiduciary net position is assumed to remain at 7.45%. The projected administrative expenses are assumed to grow at 3%.

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SECTION I – VALUATION SUMMARY

Table I-6 below summarizes the expected net benefits payments, assets, and actuarial liability. The expected ADC is determined to be zero over the entire period. The Plan is expected to remain over-funded during the entire period.

Table I-6 Expected Net Benefits, Assets, AL and ADC Current Funding Policy (\$ thousands)					
Valuation Date as of June 30,	Expected Net Benefit Payments & Administrative Expenses	Expected Actuarial Value of Assets	Expected Actuarial Liability	Fiscal Year Ending June 30,	Expected ADC Amount
2018	198,101	3,721,349	2,114,451	2019	0
2019	174,091	3,793,242	2,096,240	2020	0
2020	158,328	3,895,379	2,103,290	2021	0
2021	154,584	4,021,465	2,128,430	2022	0
2022	152,369	4,160,825	2,160,600	2023	0
2023	151,731	4,312,864	2,198,800	2024	0
2024	153,318	4,476,891	2,241,920	2025	0
2025	156,362	4,651,493	2,288,080	2026	0
2026	160,177	4,835,947	2,336,060	2027	0
2027	164,952	5,030,189	2,385,270	2028	0
2028	169,940	5,233,952	2,434,850	2029	0
2029	175,304	5,447,725	2,484,700	2030	0
2030	180,440	5,671,864	2,534,490	2031	0
2031	185,275	5,907,377	2,584,520	2032	0
2032	189,397	6,155,424	2,635,190	2033	0

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SECTION II – GASB 74 AND 75 SUMMARY

The purpose of the remainder of this report is to provide accounting and financial disclosure information under Governmental Accounting Standards Board (GASB) Statement Nos. 74 and 75 for the Other Postemployment Benefits Plan provided by the State Teachers Retirement System of Ohio. This information includes:

- Determination of the discount rate as of July 1, 2018,
- Sensitivity of the Net OPEB liability to changes in discount rates and health care cost trend rates,
- Note disclosures and required supplementary information under GASB 74 for the Plan, and
- Note disclosures and required supplementary information under GASB 75 for the collective employers.

Highlights

The OPEB Plan is currently funded in an OPEB trust. As a result, this report also contains disclosures required by GASB 74. The measurement date is June 30, 2018, which is used for the Plan’s GASB 74 reporting. The employer’s GASB 75 reporting as of June 30, 2018, is based on the June 30, 2017 measurement date. Measurements are based on the total OPEB liability and the fair value of assets as of June 30, 2018.

Table II-1 provides a summary of the key GASB 74/75 results during this measurement period.

Table II-1			
Summary of Key Results			
Reporting Date under GASB 75	6/30/2019		6/30/2018
Reporting Date under GASB 74	6/30/2018		6/30/2017
Measurement Date under GASB 74 and 75	6/30/2018		6/30/2017
Net OPEB Liability	\$	(1,606,898)	\$ 3,901,631
Deferred Outflows		187,688	225,226
Deferred Inflows		2,466,723	481,054
Net Impact on Statement of Net Position	\$	672,137	\$ 4,157,459
OPEB Expense (\$ Amount)	\$	(3,485,322)	\$ (1,190,567)
OPEB Expense (% of Payroll)		(32.34%)	(11.06%)

Amounts in Thousands

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SECTION II – GASB 74 AND 75 SUMMARY

At the June 30, 2018 reporting date, the System will report a Net OPEB Liability (NOL) of (\$1,606.9) million, deferred outflows of resources of \$187.7 million, and deferred inflows of resources of \$2,466.7 million related to the Plan. Consequently, the net impact on the System's statement of net position due to the Plan would be \$672.1 million [$\$672.1 = (\$1,606.9) - \$187.7 + \$2,466.7$]. In addition, any contributions between the measurement date and the reporting date would be reported as deferred outflows of resources to offset the cash outflows reported.

The NOL decreased approximately \$5,508.5 million during the measurement period. Changes in NOL due to plan changes are recognized immediately. Change in NOL due to actuarial gains and losses as well as assumption changes is recognized over the average remaining service life, determined at the beginning of each measurement period, which is seven years as of both the current and prior measurement period for the Plan. The change in NOL due to investment gains and losses is recognized in OPEB expense over five years, beginning in the year of occurrence. Unrecognized amounts are reported as deferred outflows of resources and deferred inflows of resources.

For the reporting year ending June 30, 2018, the annual OPEB expense is (\$3,485.3) million or (32.34%) of covered-employee payroll. This amount reflects the employer's contributions to the Plan during the measurement period, \$0.0 million, plus the change in the net impact on the System's statement of net position [$(\$3,485.3) = \$0.0 + \$672.1 - \$4,157.5$]. Volatility in OPEB expense from year to year is to be expected. A breakdown of the components of the net OPEB expense is shown in Section VI of this report.

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SECTION III – CERTIFICATION

The purpose of this report is to provide accounting and financial disclosure information under Governmental Accounting Standards Board (GASB) Statement Nos. 74 and 75 for the Other Postemployment Benefits (OPEB) Plan provided by the State Teachers Retirement System of Ohio (the System). This report is for the use of the System and their auditors in preparing financial reports in accordance with applicable law and accounting requirements. This report is not appropriate for other purposes, including the measurement of funding requirements for the Plan.

The actuary prepared the following supporting schedules including the Financial and Actuarial Sections of the *Comprehensive Annual Financial Report*:

- Financial/Required Supplementary Information
 - Schedule of Changes in Employers' Net OPEB Liability
 - Schedule of Employers' Net OPEB Liability
 - Schedule of Employers' Contributions – OPEB
 - Notes to Required Supplementary Information - OPEB
 - Sensitivity of the Net OPEB Liability to the Discount Rate and Trend Rate Assumptions

- Actuarial
 - Health Care Solvency Test
 - Key methods and assumptions used in Health Care Actuarial Valuation
 - Summary of Membership Data

In preparing our report, we relied on information (some oral and some written) supplied by the System. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

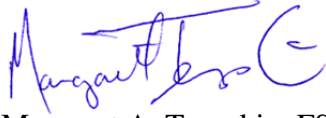
Future actuarial measurements may differ significantly from the current measurements due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions, changes in economic or demographic assumptions, changes in healthcare assumptions, and changes in plan provisions or applicable law.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board including the use of assumptions and methods for funding purposes that comply with the Actuarial Standards of Practice. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

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This report was prepared for the System for the purposes described herein and for the use by the auditors in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.



Margaret A. Tempkin, FSA, MAAA, EA
Principal Consulting Actuary



Gaelle Gravot, FSA, MAAA
Principal Consulting Actuary

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SECTION IV – DETERMINATION OF DISCOUNT RATE

The discount rate as of June 30, 2018 is 7.45%, which is the assumed long-term expected rate of return on plan investments. Projections of the Plan's fiduciary net position have indicated that it is expected to be sufficient to make projected benefit payments for current plan members following the procedures described in paragraphs 48-53 of GASB Statement 74. As such, the single rate of return, as required by the Statement, is equal to the long-term expected rate of return on the Plan's assets, which is 7.45%. The prior year's discount rate was 4.13% based on a blended discount rate of 3.58% and 7.45%.

In developing the projection of cash flows used to determine the discount rate, we assumed that no employer contributions would go into the Health Fund. Projections indicate that all future net claims will be covered by current plan assets, future governmental reimbursements, and trust fund earnings on investments.

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SECTION V – GASB 74 REPORTING INFORMATION

Note Disclosures

The tables below show the changes in the total OPEB liability (TOL), the plan fiduciary net position (i.e., fair value of plan assets) (FNP), and the net OPEB liability (NOL) during the measurement period ending on June 30, 2018.

Table V - 1 Change in Net OPEB Liability			
	Total OPEB Liability	Plan Fiduciary Net Position	Net OPEB Liability
Balances at 6/30/2017	\$ 7,377,410	\$ 3,475,779	\$ 3,901,631
Changes for the year:			
Service cost BOY, including retired member contributions	633,316		633,316
Interest	320,157		320,157
Changes of benefits	(3,340,847)		(3,340,847)
Differences between expected and actual experience	(109,227)		(109,227)
Changes of assumptions	(2,248,888)		(2,248,888)
Contributions - employer		0	0
On behalf contributions		107,197	(107,197)
Contributions - retired members		329,305	(329,305)
Net investment income		328,965	(328,965)
Benefit payments	(517,470)	(517,470)	0
Administrative expense		(2,427)	2,427
Net changes	<u>(5,262,959)</u>	<u>245,570</u>	<u>(5,508,529)</u>
Balances at 6/30/2018	<u>\$ 2,114,451</u>	<u>\$ 3,721,349</u>	<u>\$ (1,606,898)</u>

Amounts in Thousands

During the measurement year, the NOL decreased by approximately \$5.51 billion. The service cost and interest cost increased the NOL by approximately \$0.95 billion, while contributions plus investment gains offset by administrative expenses decreased the NOL by approximately \$0.76 billion.

There were changes in benefits during the year, which decreased the TOL by approximately \$3.34 billion. There were changes in assumptions during the measurement year, which decreased the TOL by approximately \$2.25 billion. The assumption changes included changes in the discount rate and healthcare costs and trends. There was a small liability loss during the year due to experience.

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SECTION V – GASB 74 REPORTING INFORMATION

Changes in the discount rate affect the measurement of the TOL. Lower discount rates produce a higher TOL, and higher discount rates produce a lower TOL. The table below shows the sensitivity of the NOL to the discount rate.

Table V - 2			
Sensitivity of Net OPEB Liability to Changes in Discount Rate			
	1% Decrease 6.45%	Discount Rate 7.45%	1% Increase 8.45%
Total OPEB Liability	\$ 2,344,087	\$ 2,114,451	\$ 1,921,453
Plan Fiduciary Net Position	<u>3,721,349</u>	<u>3,721,349</u>	<u>3,721,349</u>
Net OPEB Liability	<u>\$ (1,377,262)</u>	<u>\$ (1,606,898)</u>	<u>\$ (1,799,896)</u>
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	158.8%	176.0%	193.7%

Amounts in Thousands

A one percent decrease in the discount rate increases the TOL by approximately 11% and increases the NOL by approximately 14%. A one percent increase in the discount rate decreases the TOL by approximately 9% and decreases the NOL by approximately 12%.

Changes in the healthcare trends also affect the measurement of the TOL. Lower healthcare trends produce a lower TOL, and higher healthcare trends produce a higher TOL. The table below shows the sensitivity of the NOL to the healthcare trends.

Table V - 3			
Sensitivity of Net OPEB Liability to Changes in Healthcare Cost Trend Rates			
	1% Decrease	Healthcare Trend	1% Increase
Total OPEB Liability	\$ 1,932,348	\$ 2,114,451	\$ 2,299,391
Plan Fiduciary Net Position	<u>3,721,349</u>	<u>3,721,349</u>	<u>3,721,349</u>
Net OPEB Liability	<u>\$ (1,789,001)</u>	<u>\$ (1,606,898)</u>	<u>\$ (1,421,958)</u>
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	192.6%	176.0%	161.8%

Amounts in Thousands

A one percent decrease in the healthcare trends decreases the TOL by approximately 9% and decreases the NOL by approximately 11%. A one percent increase in the healthcare trends increases the TOL by approximately 9% and increases the NOL by approximately 12%.

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SECTION V – GASB 74 REPORTING INFORMATION

Required Supplementary Information

The schedules of Required Supplementary Information generally start with information as of the implementation of GASB 74, and eventually will build up to 10 years' of information.

The schedules below show the changes in NOL and related ratios required by GASB.

Table V - 4		
Schedule of Changes in Net OPEB Liability and Related Ratios		
	FYE 2018	FYE 2017
Total OPEB Liability		
Service cost (BOY), including retired member contributions	\$ 633,316	\$ 225,094
Interest (includes interest on service cost)	320,157	277,562
Changes of benefit terms	(3,340,847)	(1,065,892)
Differences between expected and actual experience	(109,227)	262,764
Changes of assumptions	(2,248,888)	(366,671)
Benefit payments + expenses, including refunds of member contributions	(517,470)	(489,101)
Net change in total OPEB liability	\$ (5,262,959)	\$ (1,156,244)
Total OPEB liability - beginning	7,377,410	8,533,654
Total OPEB liability - ending	\$ 2,114,451	\$ 7,377,410
Plan fiduciary net position		
Contributions - employer	\$ 0	\$ 0
On behalf contributions	107,197	79,357
Contributions - retired members	329,305	339,056
Net investment income	328,965	440,196
Benefit payments, including refunds of member contributions	(517,470)	(565,962)
Administrative expense	(2,427)	(2,496)
Net change in plan fiduciary net position	\$ 245,570	\$ 290,151
Plan fiduciary net position - beginning	3,475,779	3,185,628
Plan fiduciary net position - ending	\$ 3,721,349	\$ 3,475,779
Net OPEB liability - ending	\$ (1,606,898)	\$ 3,901,631
Plan fiduciary net position as a percentage of the total OPEB liability	176.00%	47.11%
Covered employee payroll	\$ 10,775,526	\$ 10,767,964
Net OPEB liability as a percentage of covered employee payroll	-14.91%	36.23%

Amounts in Thousands

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SECTION V – GASB 74 REPORTING INFORMATION

We have provided the FYE 2017 and 2018 columns in the schedule of employer contributions below. An additional year will be added each year until a full ten-year history is shown in this schedule.

Table V - 5 Schedule of Employer Contributions		
	FYE 2018	FYE 2017
Actuarially Determined Contribution (ADC)	\$ 0	\$ 239,430
Actual Contribution related to ADC	<u>0</u>	<u>0</u>
Contribution Deficiency/(Excess) relative to ADC	<u>\$ 0</u>	<u>\$ 239,430</u>
Covered-Employee Payroll (Pay)	\$ 10,775,526	\$ 10,767,964
Actual Contributions as % of Pay	0.00%	0.00%

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SECTION VI – GASB 75 REPORTING INFORMATION

The schedules in this section provide the information the System needs to report under GASB 75. The impact of experience gains or losses and assumption changes on the TOL are recognized in the expense over the average expected remaining service life of all active and inactive members of the Plan. As of the measurement date, this recognition period was seven years.

The table below summarizes the current balances of deferred outflows and deferred inflows of resources related to the Plan along with the net recognition over the next five years and the total recognition thereafter, if any.

Table VI - 1		
Schedule of Deferred Inflows and Outflows of Resources as of June 30, 2018 Measurement Date		
	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 187,688	\$ 93,623
Changes in assumptions	0	2,189,525
Net difference between projected and actual earnings on OPEB plan investments	0	183,575
Total	<u>\$ 187,688</u>	<u>\$ 2,466,723</u>
Amounts reported as deferred outflows and deferred inflows of resources will be recognized in OPEB expense as follows:		
Year ended June 30:		
2019	(408,034)	
2020	(408,034)	
2021	(408,035)	
2022	(366,344)	
2023	(351,717)	
Thereafter	\$ (336,871)	

Amounts in Thousands

During the year, actual experience differed from assumed experience increasing the TOL by approximately (\$109.2) million. Approximately one-seventh of this was recognized in the current year, and an identical amount will be recognized in each of the next six years, resulting in a deferred outflow of resources of approximately (\$93.6) million. In addition, assumption changes (including a change in healthcare cost and trends) decreased the TOL by approximately (\$2,248.9) million. Approximately \$321.3 million was recognized in the current year, and an identical amount will be recognized in each of the next six years, resulting in a deferred inflow of resources of approximately (\$1,927.6) million.

The impact of investment gains or losses is recognized over a period of five years. During the measurement year, there was an investment gain of \$73.1 million. Of that gain, \$14.6 million was recognized in the current year, and an identical amount will be recognized in each of the next four years, resulting in a deferred inflow of resources as of June 30, 2018 of \$58.5 million.

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SECTION VI – GASB 75 REPORTING INFORMATION

Table VI - 2
**Schedule of Deferred Inflows and Outflows of Resources as of
June 30, 2018 Projected Fiscal Year End
June 30, 2018 Measurement Date**

Recognition of Experience (Gains) and Losses											
Experience Year	Recognition Period	Total Amount	BOY Remaining Amount	EOY Remaining Amount	2018	2019	Recognition Year				
							2020	2021	2022	2023	2024
2018	7.00	\$ (109,227)	\$ (109,227)	\$ (93,623)	\$ (15,604)	\$ (15,604)	\$ (15,604)	\$ (15,604)	\$ (15,604)	\$ (15,604)	\$ (15,603)
2017*	7.00	\$ 262,764	\$ 225,226	\$ 187,688	\$ 37,538	\$ 37,538	\$ 37,538	\$ 37,538	\$ 37,538	\$ 37,536	\$ -
Recognition of liability gains and losses			\$ 115,999	\$ 94,065	\$ 21,934	\$ 21,934	\$ 21,934	\$ 21,934	\$ 21,934	\$ 21,932	\$ (15,603)
Recognition of Assumption Changes											
Experience Year	Recognition Period	Total Amount	BOY Remaining Amount	EOY Remaining Amount	2018	2019	Recognition Year				
							2020	2021	2022	2023	2024
2018	7.00	\$ (2,248,888)	\$ (2,248,888)	\$ (1,927,618)	\$ (321,270)	\$ (321,270)	\$ (321,270)	\$ (321,270)	\$ (321,270)	\$ (321,270)	\$ (321,268)
2017*	7.00	\$ (366,671)	\$ (314,289)	\$ (261,907)	\$ (52,382)	\$ (52,382)	\$ (52,382)	\$ (52,382)	\$ (52,382)	\$ (52,379)	\$ -
Recognition of assumption changes			\$ (2,563,177)	\$ (2,189,525)	\$ (373,652)	\$ (373,652)	\$ (373,652)	\$ (373,652)	\$ (373,652)	\$ (373,649)	\$ (321,268)
Recognition of Investment (Gains) and Losses											
Experience Year	Recognition Period	Total Amount	BOY Remaining Amount	EOY Remaining Amount	2018	2019	Recognition Year				
							2020	2021	2022		
2018	5	\$ (73,126)	\$ (73,126)	\$ (58,501)	\$ (14,625)	\$ (14,625)	\$ (14,625)	\$ (14,625)	\$ (14,626)		
2017*	5	\$ (208,456)	\$ (166,765)	\$ (125,074)	\$ (41,691)	\$ (41,691)	\$ (41,691)	\$ (41,692)	-		
Recognition of investment gains and losses			\$ (239,891)	\$ (183,575)	\$ (56,316)	\$ (56,316)	\$ (56,316)	\$ (56,317)	\$ (14,626)		
Total (Gains) and Losses		Total Amount	Remaining Amounts		2018	2019	Recognition Year				
			BOY	EOY			2020	2021	2022	2023	2024
Total (Gains) and Losses		\$ (2,743,604)	\$ (2,687,069)	\$ (2,279,035)	\$ (408,034)	\$ (408,034)	\$ (408,034)	\$ (408,035)	\$ (366,344)	\$ (351,717)	\$ (336,871)

* 2017 was calculated by the prior actuary

Amounts in Thousands



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SECTION VI – GASB 75 REPORTING INFORMATION

Annual OPEB Expense

The annual OPEB expense can be calculated two different ways. First, it is the change in the amounts reported on the System's Statement of Net Position that relate to the Plan and are not attributable to employer contributions. That is, it is the change in the NOL minus the change in deferred outflows plus the change in deferred inflows plus employer contributions during the year.

Alternatively, annual OPEB expense can be calculated by its individual components. While GASB does not require or suggest the organization of the individual components shown in the table on the next page, we believe it helps to understand the level and volatility of the OPEB expense.

In the calculation of OPEB expense by individual components, there are three separate sections. First, there are components referred to as operating expenses. These are items directly attributable to the operation of the Plan during the measurement year. Service cost less employee contributions represents the increase in employer-provided benefits attributable to the measurement year, and administrative expenses are the cost of operating the Plan for the year.

Second, there are the financing expenses: the interest on the TOL less the expected return on assets.

The final category is changes. This category will drive most of the volatility in OPEB expense from year to year. It includes any changes in benefits made during the year and the recognized amounts due to assumption changes, gains or losses on the TOL, and investment gains or losses.

The table on the following page shows the development of the OPEB expense through both of these methodologies. In addition to the information shown below, any contributions between the measurement date and the reporting date would be reported as deferred outflows of resources to offset the cash outflows reported.

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SECTION VI – GASB 75 REPORTING INFORMATION

Table VI - 3 Calculation of OPEB Expense		
	Measurement Year Ending	
	2018	2017
Change in Net OPEB Liability	\$ (5,508,529)	\$ (1,446,395)
Change in Deferred Outflows	37,538	(225,226)
Change in Deferred Inflows	1,985,669	481,054
Employer Contributions	<u>0</u>	<u>0</u>
OPEB Expense	\$ (3,485,322)	\$ (1,190,567)
OPEB Expense as % of Payroll	-32.34%	-11.06%
Operating Expenses		
Service cost	\$ 633,316	\$ 225,094
On behalf contributions	(107,197)	(79,357)
Retired members contributions	(329,305)	(339,056)
Benefits Paid by on Behalf	-	76,861
Administrative expenses	<u>2,427</u>	<u>2,496</u>
Total	\$ 199,241	\$ (113,962)
Financing Expenses		
Interest cost	\$ 320,157	\$ 277,562
Expected return on assets	<u>(255,839)</u>	<u>(231,740)</u>
Total	\$ 64,318	\$ 45,822
Changes		
Benefit changes	\$ (3,340,847)	\$ (1,065,892)
Recognition of assumption changes	(373,652)	(52,382)
Recognition of liability gains and losses	21,934	37,538
Recognition of investment gains and losses	<u>(56,316)</u>	<u>(41,691)</u>
Total	\$ (3,748,881)	\$ (1,122,427)
OPEB Expense	\$ (3,485,322)	\$ (1,190,567)

Amounts in Thousands

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APPENDIX A – MEMBERSHIP INFORMATION

The census data used to develop the Total OPEB Liability (TOL) as of July 1, 2018 was provided by the System.

	January 1, 2018	July 1, 2018	% Change
Active Participants			
Number	168,132	170,327	1.3%
Average age	43.9	43.78	-0.3%
Average years of service	12.7	12.55	-1.2%
Projected payroll (in thousands)	\$ 10,685,759	\$ 11,186,344	4.7%
Average expected retirement age	61.5	61.6	0.1%
Retirees Enrolled in Health Care			
Number of retirees	102,170	101,653	-0.5%
Average age of retirees	72.2	72.7	0.7%
Numbers of spouses and dependents (excluding children)	15,458	14,913	-3.5%
Average age of spouses	73.2	73.4	0.3%
Surviving Spouses Enrolled in Health Care			
Number	4,826	4,766	-1.2%
Average age	81.4	81.6	0.2%
Terminated Members Entitled but Not Yet Eligible			
Number	17,694	18,384	3.9%
Average age	50.5	50.2	-0.6%
Number of terminated members eligible		3,340	
Average age		57.3	

Active Member Data as of July 1, 2018

COUNTS BY AGE/SERVICE											
Age	Service										Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	
Under 25	1,634	3,044	0	0	0	0	0	0	0	0	4,678
25 to 29	1,787	10,903	4,169	1	0	0	0	0	0	0	16,860
30 to 34	1,291	5,680	9,783	3,992	0	0	0	0	0	0	20,746
35 to 39	1,240	4,542	5,024	9,956	4,708	2	0	0	0	0	25,472
40 to 44	1,147	3,433	3,252	3,963	10,046	3,821	0	0	0	0	25,662
45 to 49	965	3,017	2,818	2,994	4,517	9,117	2,783	0	0	0	26,211
50 to 54	658	1,967	2,002	2,260	2,809	3,430	5,647	1,938	1	0	20,712
55 to 59	558	1,435	1,418	1,687	2,468	2,471	2,354	2,347	307	0	15,045
60 to 64	410	1,054	934	1,041	1,604	1,848	1,717	976	307	32	9,923
65 to 69	275	624	428	353	418	452	455	366	131	46	3,548
70 & up	221	355	222	116	110	104	109	106	62	65	1,470
Total	10,186	36,054	30,050	26,363	26,680	21,245	13,065	5,733	808	143	170,327

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APPENDIX A – MEMBERSHIP INFORMATION

Reconciliation of Members							
	Active	Retired	Surviving Spouse	Disabled	Spouse of Retiree	Term Vested	Total
January 1, 2018	168,132	98,231	4,826	3,939	15,458	17,694	308,280
Changes due to:							
Active							
To Retired	(818)	818	-	-	-	-	-
To Disabled	(15)	-	-	15	-	-	-
To Death	(15)	-	-	-	-	-	(15)
To Term Vested	(2,644)	-	-	-	-	2,644	-
Retired							
To Active	1	(1)	-	-	-	-	-
To Term Vested	-	(1)	-	-	-	1	-
Disabled							
To Active	3	-	-	(3)	-	-	-
To Retired	-	10	-	(10)	-	-	-
To Term Vested	-	-	-	(3)	-	3	-
Spouse of Retiree							
To Surviving Spouse	-	-	162	-	(162)	-	-
Term Vested							
To Active	1,312	-	-	-	-	(1,312)	-
To Retired	-	24	-	-	-	(24)	-
Additions	16,348	607	161	30	230	518	17,894
Departures	(11,977)	(1,858)	(383)	(145)	(613)	(1,140)	(16,116)
June 30, 2018	170,327	97,830	4,766	3,823	14,913	18,384	310,043

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions for this valuation were selected based on recent experience and expectations for the future. Many of the demographic assumptions were selected by the prior actuary based on their prior experience study. We have not performed our own experience study but reviewed the reports and letters of the prior actuary and believe the assumptions to be reasonable.

Economic Assumptions

- 1. Expected Return on Assets** 7.45% per year, based on long-term rate of return on invested plan assets

- 2. Municipal Bond Yield** 3.87% as of July 1, 2018
Bond Buyer 20-Bond GO Index as of June 28, 2018

- 3. Discount Rate** 7.45%, based on a blend of 3.87% municipal bond yield rate and the expected return on invested plan assets. The assets are sufficient to cover all expected benefits, thus the long-term rate of return is used.

- 4. Payroll Increase Rate** 3.00% per year for purposes of attributing individual costs under the Entry Age actuarial cost method

- 5. Salary Increase Rate** Varies by age from 2.5% to 12.5%

- 6. Per Person Health Care Cost Trends**

Year	Medical		Prescription Drugs		Premium Trends		Contribution
	Pre-Medicare	Medicare	Pre-Medicare	Medicare	Pre-Medicare	Medicare	Limited Medicare
2019	6.00%	5.00%	8.00%	-5.23%	6.48%	0.00%	0.00%
2020	5.87%	4.93%	7.73%	9.62%	6.32%	5.41%	5.36%
2021	5.73%	4.87%	7.47%	8.06%	6.16%	7.26%	6.00%
2022	5.60%	4.80%	7.20%	7.75%	6.00%	7.03%	6.00%
2022	5.60%	4.80%	7.20%	7.75%	6.00%	7.03%	6.00%
2023	5.47%	4.73%	6.93%	7.44%	5.84%	6.79%	6.00%
2024	5.33%	4.67%	6.67%	7.13%	5.67%	6.55%	6.00%
2025	5.20%	4.60%	6.40%	6.81%	5.51%	6.30%	6.00%
2026	5.07%	4.53%	6.13%	6.50%	5.34%	6.05%	6.00%
2027	4.93%	4.47%	5.87%	6.19%	5.18%	5.80%	5.81%
2028	4.80%	4.40%	5.60%	5.88%	5.01%	5.55%	5.56%
2029	4.67%	4.33%	5.33%	5.56%	4.84%	5.29%	5.30%
2030	4.53%	4.27%	5.07%	5.25%	4.67%	5.04%	5.04%
2031	4.40%	4.20%	4.80%	4.94%	4.51%	4.78%	4.78%
2032	4.27%	4.13%	4.53%	4.63%	4.34%	4.52%	4.52%
2033	4.13%	4.07%	4.27%	4.31%	4.17%	4.26%	4.26%
2034	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
2035	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
2036	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
2037+	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%

The ultimate trend rate reflects assumed nominal per capita GDP growth.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

7. Changes Since the Last Valuation

The trend assumptions were updated to reflect the current market place. The GASB 74/75 discount rate was changed from 4.13% to 7.45%.

Demographic Assumptions

1. Retirement Rates

Pension eligibility requirements are age 60 with five years of service, or 30 years of service regardless of age, or according to the following schedule:

Retirement Effective Date	Minimum Age and Years of Service
8/1/2015 - 7/1/2017	Age 55 and 26 years
8/1/2017 - 7/1/2019	Age 55 and 27 years
8/1/2019 - 7/1/2021	Age 55 and 28 years
8/1/2021 - 7/1/2023	Age 55 and 29 years
8/1/2023	Age 55 and 30 years

After meeting pension eligibility requirements, the following rates apply.

The defined benefit participants' grandfathered group is set to be those eligible to retire on or before 7/1/2015.

Grandfathered Males					Grandfathered Females				
	Service					Service			
Age	<25	25 - 29	30 - 34	35 +	Age	<25	25 - 29	30 - 34	35 +
<54	0%	0%	20%	30%	<54	0%	0%	20%	35%
54	0%	0%	20%	40%	54	0%	0%	20%	40%
55-58	0%	6%	20%	40%	55-58	0%	9%	20%	40%
59	0%	7%	20%	40%	59	0%	10%	25%	40%
60	10%	7%	20%	40%	60	10%	10%	30%	45%
61	10%	7%	20%	40%	61	10%	10%	30%	45%
62	12%	8%	20%	40%	62	10%	12%	30%	45%
63	12%	8%	25%	35%	63	10%	12%	35%	45%
64	12%	12%	25%	25%	64	15%	20%	35%	45%
65	20%	20%	25%	25%	65	25%	30%	35%	45%
66	20%	20%	25%	25%	66	20%	30%	35%	45%
67	15%	20%	25%	25%	67	20%	20%	35%	45%
68	15%	20%	25%	20%	68	20%	20%	35%	45%
69	15%	20%	25%	20%	69	20%	20%	35%	45%
70-74	15%	20%	25%	20%	70-74	20%	20%	35%	40%
75+	100%	100%	100%	100%	75+	100%	100%	100%	100%

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

For those defined benefit participants not eligible to retire on or before 7/1/2015, the following rates apply.

Non-Grandfathered Males					Non-Grandfathered Females				
Age	Service				Age	Service			
	<25	25 - 29*	29 - 34**	35 +**		<25	25 - 29*	29 - 34**	35 +**
<59	0%	3%	20%	20%	<59	0%	5%	20%	20%
59	0%	5%	20%	20%	59	0%	5%	25%	25%
60	5%	5%	20%	25%	60	10%	10%	30%	30%
61	6%	6%	20%	25%	61	10%	10%	30%	30%
62	7%	7%	20%	25%	62	10%	10%	30%	30%
63	8%	8%	25%	25%	63	10%	10%	35%	35%
64	10%	10%	25%	25%	64	15%	15%	35%	35%
65	20%	20%	25%	25%	65	30%	30%	35%	35%
66	20%	20%	25%	25%	66	30%	30%	35%	35%
67	20%	20%	25%	25%	67	20%	20%	35%	35%
68	20%	20%	25%	20%	68	20%	20%	35%	35%
69	20%	20%	25%	20%	69	20%	20%	35%	35%
70-74	20%	20%	25%	20%	70-74	20%	20%	35%	30%
75+	100%	100%	100%	100%	75+	100%	100%	100%	100%

* Rates prior to age 60 are zero if retirement eligibility requirements are not met

** Use two times 25-29 years of service rates if not eligible for unreduced retirement (prior to age 65)

Combined Plan					
Age	Male	Female	Age	Male	Female
60	13%	22%	68	12%	12%
61	7%	9%	69	12%	12%
62	7%	9%	70	12%	12%
63	7%	9%	71	12%	12%
64	9%	15%	72	12%	12%
65	17%	20%	73	12%	12%
66	15%	13%	74	12%	12%
67	12%	13%	75	100%	100%

For Terminated members: we assumed 100% at age 62 or the first age at which unreduced benefits are available.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

2. Rates of Termination/Withdrawal

Age	Vested Termination Rate				
	Mortality*		Withdrawal**		Disability
	Male	Female	Male	Female	
20	0.04%	0.02%	11.25%	13.25%	0.01%
30	0.05%	0.02%	2.75%	3.75%	0.01%
40	0.06%	0.04%	1.75%	1.50%	0.05%
50	0.17%	0.11%	2.00%	1.75%	0.18%

* RP-2014 Employee Mortality Table, projected forward generationally using mortality improvement scale MP-2016. Rates shown are before any generational projection.

** During the first five years of service, the following rates apply:

Service	Non-Vested Termination Rate	
	Male	Female
< 1 Year	30.00%	25.00%
1-2 Years	20.00%	20.00%
2-3 Years	15.00%	10.00%
3-5 Years	10.00%	10.00%

3. Rates of Mortality

Healthy Mortality: RP-2014 Annuitant Mortality Tables with 50% of rates through age 69, 70% of rates between ages 70 and 79, 90% of rates between ages 80 and 84, and 100% of rates thereafter, projected forward generationally using mortality improvement scale MP-2016.

Disabled Mortality: RP-2014 Disabled Mortality table with 90% of rates for males and 100% of rates for females, projected forward generationally using mortality improvement scale MP-2016.

4. Percent of Retirees Electing Coverage

- 75% of future eligible service retirees and 65% of future eligible disabled retirees are assumed to elect coverage.
- 100% of combined plan and 50% of defined benefit plan future inactive vested participants are assumed to cash out.
- 30% of inactive vested participants who do not cash out are assumed to elect coverage.
- Current and future participants for whom the value of the benefits received is less than their contribution are assumed to drop coverage.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

5. Benefit Elections

Below is a summary of medical plan election rates for future retirees by Medicare status.

Pre-Medicare Medical Plans	Benefit Election Rate
Medical Mutual / Aetna Basic PPO	93.0%
AdultCare PPO	3.5%
Paramount Health Care HMO	3.5%

Medicare Medical Plans	Benefit Election Rate
Aetna Medicare Advantage	92.6%
Medical Mutual / Aetna Basic PPO	5.4%
AdultCare PPO	1.1%
Paramount Health Care HMO	0.9%

These weights were used to blend premium rates developed by Willis Towers Watson, less applicable subsidies, discounts and rebates (the “Recoveries”), to estimate individual retiree and spouse costs by age and gender.

6. Spousal Coverage

Of those future retirees who elect to continue health coverage, 20% were assumed to have an eligible spouse who also opts for health coverage at that time.

7. Dependent Age

For current retirees, actual spouse date of birth was used when available.

For future retirees, male retirees are assumed to be three years older than their partners, and female retirees are assumed to be one year younger than their partners.

8. Administrative Expenses

Health plan administrative expenses are included in the per capita claims costs.

9. Changes Since the Last Valuation

Benefit percentage elections were updated to reflect current elections.

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

Claim and Expense Assumptions

The claims costs are developed based on actual medical and prescription drug claims paid from July 1, 2015 to June 30, 2017. An adjustment is made to the claims to account for the children of retirees. Additionally, 2018 contractual administrative expenses and an estimated CMS Prescription drug plan subsidy are included. The resulting per person per month (PPPM) cost is then adjusted using age curves.

1. Average Annual Claims and Expense Assumptions

The following 7/1/2018-6/30/2019 claims costs were developed based on:

- The average of the 2018 and 2019 premium rates the System pays its vendors,
- The average WTW’s projected 2018 and 2019 Employer Group Waiver Program (EGWP) Recoveries that the System is expected to receive throughout 2021, and
- An estimate of the Rx rebates PPPM for the Non-Medicare population based on actual 2017 non-Medicare Rx rebates.

All rates were converted from a Per Adult or Per Child rate to a composite Per Person rate. A child load of 3.1% for medical and 1.9% for Rx was added onto the NME pre-65 claims and expenses to account for the fact that only adults are inputted in ProVal.

Fiscal Year Ending 6/30/2019 Average Claim and Expense Assumptions								
Age	Medical NME		Rx NME		Medical ME		Rx ME	
	Male	Female	Male	Female	Male	Female	Male	Female
40	\$2,867	\$5,202	\$939	\$1,164	\$642	\$578	\$1,703	\$1,632
45	\$3,786	\$5,387	\$1,218	\$1,390	\$925	\$833	\$2,452	\$2,350
50	\$4,961	\$6,200	\$1,548	\$1,643	\$1,174	\$1,057	\$3,112	\$2,982
55	\$6,392	\$7,589	\$1,929	\$1,924	\$1,286	\$1,158	\$3,411	\$3,268
60	\$8,080	\$8,936	\$2,360	\$2,233	\$1,213	\$1,092	\$3,216	\$3,081
64	\$9,615	\$9,075	\$2,742	\$2,499	\$1,020	\$918	\$2,705	\$2,592
65	\$9,502	\$8,989	\$2,798	\$2,529	\$618	\$566	\$1,639	\$1,598
70	\$10,419	\$9,967	\$3,322	\$2,887	\$745	\$642	\$1,845	\$1,673
75	\$11,423	\$11,051	\$3,897	\$3,272	\$908	\$765	\$1,799	\$1,643
80	\$12,525	\$12,253	\$4,521	\$3,684	\$1,078	\$900	\$1,629	\$1,551
85	\$13,732	\$13,586	\$5,195	\$4,124	\$1,231	\$1,019	\$1,434	\$1,432

2. Retiree Contributions

In 2018, non-Medicare retirees receive a subsidy of 1.9% per year of service to a maximum of 30 years, and Medicare retirees receive a subsidy of 2.1% per year of service to a maximum of 30 years. In 2019, non-Medicare retirees receive a subsidy of 1.944% per year of service to a maximum of 30 years.

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Beginning in 2020, the STRS Ohio subsidy dollar amount for non-Medicare plans will be frozen at the current 2019 levels. Annual increases in the STRS Ohio subsidy dollar amount for Medicare plans will be based on the percentage increase in the Aetna Medicare Advantage Plan, limited at 6%.

For those who retire on or after August 2023, the first five years of service do not count towards the subsidy, so subsidy percentages are shifted five years, and those with less than 20 years of service receive no subsidy. The following table shows the blended premium for pre-Medicare medical and Medicare plans.

Sample monthly premium subsidies paid by the STRS of Ohio pays for eligible retirees for the year beginning January 1, 2019 are shown below.

2019 Rates	Pre-Medicare Plans			Medicare Plans			
	Medical Mutual / Aetna Basic PPO	AdultCare PPO	Paramount HMO	Aetna Medicare Advantage	Medical Mutual Basic PPO	AdultCare PPO	Paramount HMO
Years of Service				0 increase	No increase in Aetna rates, same as 2018		
Total Cost¹	\$957	\$890	\$946	\$342	\$300	\$473	\$359
	Frozen at 2019 Levels			Based on increase in Aetna MA plan, limit 6%			
15	\$279	\$260	\$276	\$108	\$95	\$108	\$108
16	\$298	\$277	\$294	\$115	\$101	\$115	\$115
17	\$316	\$294	\$313	\$122	\$107	\$122	\$122
18	\$335	\$311	\$331	\$129	\$113	\$129	\$129
19	\$353	\$329	\$349	\$136	\$120	\$136	\$136
20	\$372	\$346	\$368	\$144	\$126	\$144	\$144
21	\$391	\$363	\$386	\$151	\$132	\$151	\$151
22	\$409	\$381	\$405	\$158	\$139	\$158	\$158
23	\$428	\$398	\$423	\$165	\$145	\$165	\$165
24	\$446	\$415	\$441	\$172	\$151	\$172	\$172
25	\$465	\$433	\$460	\$180	\$158	\$180	\$180
26	\$484	\$450	\$478	\$187	\$164	\$187	\$187
27	\$502	\$467	\$497	\$194	\$170	\$194	\$194
28	\$521	\$484	\$515	\$201	\$176	\$201	\$201
29	\$540	\$502	\$533	\$208	\$183	\$208	\$208
30 +	\$558	\$519	\$552	\$215	\$189	\$215	\$215
Cost Per Child	\$282	\$246	\$260	\$342	\$300	\$473	\$359

¹ Also applies to spousal coverage, retirees not eligible for premium subsidy, and disabled adult child (sponsored dependent)

A weighted average total cost across the plans shown above is used as the STRS Ohio subsidy. These amounts are assumed to increase with health trend.

Weighted Average Premiums	
Pre-65 retirees	\$ 11,247.51
Retirees age 65+	\$ 4,093.93

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APPENDIX B – ACTUARIAL ASSUMPTIONS AND METHODS

3. Medicare Part D Subsidy

An estimate of \$121.44 per Medicare participant is included in the FYE 2019 rates. We assumed the Part D Direct subsidy decreases 3% annually for the first two years; subsequently the Part D Direct subsidy is implicitly trended when the trends showed on page 16 of this report are applied to the net Medicare Rx claims and expenses. The System does not participate in the Retiree Drugs Subsidy (RDS) program; per GASB guidance, RDS Part D Subsidies are not reflected in valuations.

4. Medicare Part B Premium Subsidy

Service retirees and disabled retirees who are enrolled in a STRS Ohio medical plan and who participate in Medicare Part B receive \$29.90 monthly reimbursement towards the Part B premiums through 2019. This benefit will be eliminated effective January 1, 2020.

5. Medicare Eligibility

All retirees who turn age 65 are assumed to be eligible for Medicare.

6. Geography

Implicitly assumed to remain the same as current retirees.

7. Changes Since the Last Valuation

There was no change to the claims costs process. Claim curves were updated to reflect the current market place. The non-Medicare subsidy percentage was increased effective January 1, 2019 from 1.9% to 1.944%. The non-Medicare frozen subsidy base premium was increased effective January 1, 2019. The Part B monthly reimbursement elimination date was postponed to January 1, 2020.

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APPENDIX C – SUMMARY OF PLAN PROVISIONS

Summary of Key Substantive Plan Provisions

Eligibility

The eligibility requirements for access to retiree health care coverage and premium subsidies are as follows:

Service Retiree Who Retires Before August 2023

If with 15 or more years of service, then retiree receives access to healthcare coverage and a premium subsidy if they enroll.

If with less than 15 years of service and a benefit effective date prior to January 1, 2004, then retiree receives access to healthcare coverage but no premium subsidy.

If with less than 15 years of service and a benefit effective date on or after January 1, 2004, then retiree is not eligible for health care coverage.

Service Retiree Who Retires After August 2023

If with 20 or more years of service, then retiree receives access to healthcare coverage and a premium subsidy if they enroll.

If with less than 20 years of service and a benefit effective date on or after January 1, 2004, then retiree is not eligible for health care coverage.

Disabled Retiree

Receives access to healthcare coverage and a premium subsidy if they enroll.

Effective Date of Coverage

Service Retirement Benefit of Survivor Benefit Recipients

The first of the month following the date the STRS Ohio Retirement Board approves the application, or the effective date of retirement, whichever is later.

Service Retirement Benefit of Disability Benefit Recipients

The first of the month following the date the STRS Ohio Retirement Board approves the disability benefits, or the first of the month following the date the application is received by STRS Ohio, whichever is later.

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APPENDIX C – SUMMARY OF PLAN PROVISIONS

Duration of Coverage

Lifetime, except for partial reimbursements towards Medicare Part B premium will be eliminated January 1, 2020.

Dependent Benefits

Same as retirees, except for no partial reimbursement towards Medicare Part B premium.

Dependent Coverage

Dependents of retirees and survivors are eligible to enroll in health care coverage, but do not receive a premium subsidy. Individuals who become surviving spouses prior to January 1, 2015 receive a premium subsidy at the same level as the deceased member for five years with first year beginning the later of January 1, 2004 or the effective date of benefit commencement. After five years, surviving spouses receive access to coverage with no premium subsidy. Individuals who become surviving spouses on or after January 1, 2015 do not receive a premium subsidy.

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APPENDIX C – SUMMARY OF PLAN PROVISIONS

Summary of 2018 Benefit Plans

State Teachers Retirement System of Ohio - Non Medicare Retirees			
Plan	Medical Mutual (Ohio) / Aetna (outside Ohio) Indemnity ¹ or PPO	AultCare PPO	Paramount Health Care HMO (NW Ohio, S Michigan)
<u>In-Network (INN) Benefits</u>			
Deductible per Enrollee	\$2,500	\$2,500	\$2,000/\$4,000 Single/Family
Coinsurance	80%	80%	80%
Out-of-Pocket Max per Enrollee	\$6,500	\$6,500	\$4,000/\$8,000 Single/Family
Coverages			
Preventive Care	Fully Covered	Fully Covered	Fully Covered After Deduct
Well Woman	Fully Covered	Fully Covered	Fully Covered After Deduct
Office Visit (OV)-Primary Care	\$20 Copay for first 2 Visits, DC* After	\$20 Copay for first 2 Visits, DC* After	\$10
OV - Specialist Care Provider (SCP)	DC*	DC*	\$20
Hospital Emergency Room (ER)	\$150 Copay + DC*	\$150 Copay + DC*	\$150
Urgent Care (UC)	\$40	\$40	\$40
Outpatient Surgery	DC*	DC*	DC*
Hospital Inpatient	DC*	DC*	DC*
Lifetime Max	No Limit	No Limit	No Limit
<u>Out-of-Network (OON) Benefits</u>			
Deductible per Enrollee	\$5,000	\$5,000	
Coinsurance	50%	50%	
Out-of-Pocket Max per Enrollee	\$13,000	\$13,000	
Office Visit (OV)-Primary Care (PCP)	DC*	DC*	
OV - Specialist Care Provider (SCP)	DC*	DC*	
<u>Mental Health and Substance Abuse</u>			
Mental Health and Substance Abuse Inpatient	DC*	DC*	DC*
Mental Health and Substance Abuse Outpatient	\$20 Copay for first 2 Visits, DC* After	\$20 Copay for first 2 Visits, DC* After	\$10
<u>Prescription Drug Benefits</u>			
Deductible (Brand and Specialty Only)	\$250	\$250	\$250
Out-of-Pocket Max per Person	\$5,000	\$5,000	\$5,000
Preferred Pharmacy Coverage:			
Retail: Generic / Covered Brand / Specialty	\$10 / \$30 / 13% up to max \$550	\$10 / \$30 / 13% up to max \$550	\$10 / \$30 / 13% up to max \$550
Mail Order: Low-Cost Generic / Generic / Covered Brand / Specialty	\$9 / \$25 / \$75 / 13% up to max \$550	\$9 / \$25 / \$75 / 13% up to max \$550	\$9 / \$25 / \$75 / 13% up to max \$550
Non-Preferred Pharmacy Coverage:			
Retail	\$20 / \$40 / 13% up to max of \$560	\$20 / \$40 / 13% up to max of \$560	\$20 / \$40 / 13% up to max of \$560

*DC = Deductible and Coinsurance

¹No network, benefits same as in-network benefits

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APPENDIX C – SUMMARY OF PLAN PROVISIONS

State Teachers Retirement System of Ohio - Medicare Retirees				
Plan	Aetna Medicare Plan (Medicare Advantage PPO)	Medical Mutual Basic (Indemnity ¹ or PPO)	AultCare PPO	Paramount Elite HMO (Medicare Advantage)
<u>In-Network (INN) Benefits</u>				
Deductible per Enrollee	\$150	\$2,500	\$150	\$150
Coinsurance	96%	80%	96%	96%
Out-of-Pocket Max per Enrollee	\$1,500	\$6,500	\$1,500	\$1,500
Coverages				
Preventive Care	Fully Covered	Fully Covered	Fully Covered	Fully Covered
Well Woman	Fully Covered	Fully Covered	Fully Covered	Fully Covered
Office Visit (OV)-Primary Care	\$15	\$20 Copay for first 2 Visits, DC* After	\$15 Copay	\$15 Copay
OV - Specialist Care Provider (SCP)	\$25	DC*	\$25 Copay	\$25 Copay
Hospital Emergency Room (ER)	\$75	\$150 Copay + DC*	\$75	\$75
Urgent Care (UC)	\$40	\$40	\$40	\$40
Outpatient Surgery	DC*	DC*	DC*	DC*
Hospital Inpatient	DC*	DC*	DC*	DC*
Lifetime Max	No Limit	No Limit	No Limit	No Limit
<u>Out-of-Network (OON) Benefits</u>				
Deductible per Enrollee	\$500	\$5,000	\$500	
Coinsurance	92%	50%	92%	
Out-of-Pocket Max per Enrollee	\$2,500	\$13,000	\$2,500	
Office Visit (OV)-Primary Care (PCP)	\$40	Same as In-Network	\$40	
OV - Specialist Care Provider (SCP)	\$55	Same as In-Network	\$55	
<u>Mental Health and Substance Abuse</u>				
Mental Health and Substance Abuse Inpatient	DC*	DC*	DC*	DC*
Mental Health and Substance Abuse Outpatient	\$25	\$55 after deductible	DC*	\$20
<u>Prescription Drug Benefits</u>				
Deductible (Brand and Specialty Only)	\$250	\$250	\$250	\$250
Out-of-Pocket Max per Person	\$5,000	\$5,000	\$5,000	\$5,000
Preferred Pharmacy Coverage:				
Retail: Generic / Covered Brand / Specialty	\$10 / \$30 / 13% up to max \$550	\$10 / \$30 / 13% up to max \$550	\$10 / \$30 / 13% up to max \$550	\$10 / \$30 / 13% up to max \$550
Mail Order: Low-Cost Generic / Generic / Covered Brand / Specialty	\$9 / \$25 / \$75 / 13% up to max \$550	\$9 / \$25 / \$75 / 13% up to max \$550	\$9 / \$25 / \$75 / 13% up to max \$550	\$9 / \$25 / \$75 / 13% up to max \$550
Non Preferred Pharmacy Coverage:				
Retail	\$20 / \$40 / 13% up to max of \$560	\$20 / \$40 / 13% up to max of \$560	\$20 / \$40 / 13% up to max of \$560	\$20 / \$40 / 13% up to max of \$560

*DC = Deductible and Coinsurance

¹No network, benefits same as in-network benefits

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APPENDIX D – GLOSSARY OF TERMS

1. Actuarial Assumptions

Assumptions as to the occurrence of future events affecting OPEB costs, such as mortality, withdrawal, and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the actuarial value of assets; and other relevant items.

2. Actuarial Cost Method

A procedure for determining the actuarial present value of OPEB plan benefits and expenses and for developing an allocation of such value to each year of service, usually in the form of a normal cost and an actuarial liability.

3. Actuarially Determined Contribution

A target or recommended contribution for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

4. Actuarial Gain (Loss)

A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, as determined in accordance with a particular actuarial cost method.

5. Actuarial Liability

The portion of the actuarial present value of projected benefits which will not be paid by future normal costs. It represents the value of the past normal costs with interest to the valuation date.

6. Actuarial Present Value (Present Value)

The value as of a given date of a future amount or series of payments, the actuarial present value discounts the payments to the given date at the assumed investment return and includes the probability of the payment being made. As a simple example: assume you owe \$100 to a friend one year from now. Also, assume there is a 1% probability of your friend dying over the next year, in which case you will not be obligated to pay him. If the assumed investment return is 10%, the actuarial present value is:

$$\frac{\text{Amount}}{\$100} \times \frac{\text{Probability of Payment}}{(1 - .01)} \times \frac{1/}{(1+0.10)} = \frac{\text{Present Value}}{\$90}$$

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APPENDIX D – GLOSSARY OF TERMS

7. Actuarial Valuation Date

The date as of which an actuarial valuation is performed. This date may be up to 24 months prior to the measurement date and up to 30 months prior to the employer's reporting date.

8. Actuarial Value of Assets

The value of cash, investments, and other property belonging to an OPEB plan as used by the actuary for the purpose of an actuarial valuation. The purpose of an actuarial value of assets is to smooth out fluctuations in market values. This way long-term costs are not distorted by short-term fluctuations in the market.

9. Amortization Payment

The portion of the OPEB plan contribution which is designed to pay interest and principal on the unfunded actuarial liability in order to pay for that liability in a given number of years.

10. Entry Age Normal Actuarial Cost Method

A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages.

11. Normal Cost

That portion of the actuarial present value of OPEB plan benefits and expenses which is allocated to a valuation year by the actuarial cost method.

12. Unfunded Actuarial Liability

The excess of the actuarial liability over the actuarial value of assets.

13. Funded Percentage

The ratio of the actuarial value of assets to the actuarial liabilities.

14. Mortality Table

A set of percentages which estimate the probability of death at a particular point in time. Typically, the rates are annual and based on age and sex.

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APPENDIX D – GLOSSARY OF TERMS

15. Discount Rate

The assumed interest rate used for converting projecting dollar related values to a present value as of the valuation date.

16. Medical Trend

The assumed increase in dollar related values in the future due to the increase in the cost of health care.

17. Deferred Inflow of Resources

An acquisition of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 75, these are experience gains on the total OPEB liability, assumption changes reducing the total OPEB liability, or investment gains that are recognized in future reporting periods.

18. Deferred Outflow of Resources

A consumption of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 75, these are experience losses on the total OPEB liability, assumption changes increasing the total OPEB liability, or investment losses that are recognized in future reporting periods.

19. Entry Age Actuarial Cost Method

The actuarial cost method required for GASB 74 and 75 calculations. Under this method, the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this actuarial present value allocated to a valuation year is called the Service Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future service costs is called the total OPEB liability.

20. Measurement Date

The date as of which the total OPEB liability and plan fiduciary net position are measured, the total OPEB liability may be projected from the Actuarial Valuation Date to the Measurement Date. The Measurement Date must be the same as the Reporting Date for the plan.

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APPENDIX D – GLOSSARY OF TERMS

21.Net OPEB Liability

The liability of employers and non-employer contributing entities for employees for benefits provided through a defined benefit OPEB plan. It is calculated as the total OPEB liability less the plan fiduciary net position.

22.Plan Fiduciary Net Position

The fair or Market Value of Assets.

23.Reporting Date

The last day of the plan or employer’s fiscal year.

24.Service Cost

The portion of the actuarial present value of projected benefit payments that is attributed to the current period of employee service in conformity with the requirements of GASB 74 and 75. The Service Cost is the normal cost calculated under the entry age actuarial cost method.

25.Total OPEB Liability

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of GASB 74 and 75. The total OPEB liability is the Actuarial Liability calculated under the entry age actuarial cost method.

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APPENDIX E – SUPPORTING SCHEDULES

Health Care Solvency Test, 2015 - 2018 (dollars in thousands)							
Actuarial Valuation Date	Accrued Liability For:			Fair Market Value of Assets	Portion of Accrued Liability Covered by Fair Value of Assets:		
	(1) Active Members	(2) Inactive Members	(3) Retirees, Survivors & Dependents		(1)	(2)	(3)
Jan 1, 2015	\$1,742,597	\$15,459	\$2,918,167	\$3,454,000	100%	100%	58%
Jan 1, 2016	\$1,830,799	\$19,435	\$3,303,997	\$3,258,197	100%	100%	43%
Jan 1, 2017	\$2,596,979	\$18,783	\$3,271,404	\$3,222,093	100%	100%	19%
Jan 1, 2018	\$777,500	\$2,424	\$1,636,026	\$3,691,399	100%	100%	178%
June 30, 2018	\$784,921	\$1,965	\$1,327,565	\$3,721,349	100%	100%	221%

Key Methods and Assumptions Used in Health Care Actuarial Valuation	
Valuation Date	6/30/2018
Actuarial cost method	Entry Age Normal, Level Percent of Pay
Amortization method	30 year open level percent of pay
Asset valuation method	Fair Market Value
Actuarial Assumptions:	
Investment Rate of Return	7.45%
Discount rate	7.45%
Amortization growth rate	3.00%
Salary increases	Varies by age from 2.5% to 12.5%

Health Care Cost Trend Rates									
Year	Medical		Prescription Drugs		Year	Medical		Prescription Drugs	
	Pre-Medicare	Medicare	Pre-Medicare	Medicare		Pre-Medicare	Medicare	Pre-Medicare	Medicare
2019	6.00%	5.00%	8.00%	-5.23%	2028	4.80%	4.40%	5.60%	5.88%
2020	5.87%	4.93%	7.73%	9.62%	2029	4.67%	4.33%	5.33%	5.56%
2021	5.73%	4.87%	7.47%	8.06%	2030	4.53%	4.27%	5.07%	5.25%
2022	5.60%	4.80%	7.20%	7.75%	2031	4.40%	4.20%	4.80%	4.94%
2022	5.60%	4.80%	7.20%	7.75%	2032	4.27%	4.13%	4.53%	4.63%
2023	5.47%	4.73%	6.93%	7.44%	2033	4.13%	4.07%	4.27%	4.31%
2024	5.33%	4.67%	6.67%	7.13%	2034	4.00%	4.00%	4.00%	4.00%
2025	5.20%	4.60%	6.40%	6.81%	2035	4.00%	4.00%	4.00%	4.00%
2026	5.07%	4.53%	6.13%	6.50%	2036	4.00%	4.00%	4.00%	4.00%
2027	4.93%	4.47%	5.87%	6.19%	2037+	4.00%	4.00%	4.00%	4.00%

Summary of Membership Data						
	Valuation Date	Jan 1, 2015	Jan 1, 2016	Jan 1, 2017	Jan 1, 2018	June 30, 2018
Active Members		169,295	164,925	169,205	168,132	170,327
Inactive Members		16,823	17,275	17,011	17,694	18,384
STRS Ohio Health Care Program Enrollees						
	Jan 1, 2016	Jan 1, 2017	Jan 1, 2018	Added	Terminated	June 30, 2018
Retirees	101,539	99,835	98,231	1,459	1,860	97,830
Disabled Retirees	4,300	4,131	3,939	45	161	3,823
Survivors	4,880	4,744	4,826	323	383	4,766
Spouses and Dependents (excluding Children)	17,722	16,376	15,458	230	775	14,913
Total	128,441	125,086	122,454	2,057	3,179	121,332
Annual Allowance (\$thousands)	\$426,730	\$427,693	\$351,457	\$5,967	\$8,681	\$348,743
	Valuation Date	Jan 1, 2015	Jan 1, 2016	Jan 1, 2017	Jan 1, 2018	June 30, 2018
Average per health care participant annual benefit		\$2,218	\$2,115	\$2,205	\$273	\$667