Milliman

TOWN OF GUILFORD PUBLIC SCHOOL EMPLOYEES' (NON-CERTIFIED) PENSION PLAN

GASB 67 and 68 DISCLOSURE
Fiscal Year: July 1, 2017 to June 30, 2018

Prepared by

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Certification

Actuarial computations presented in this report under Statements No. 67 and 68 of the Governmental Accounting Standards Board are for purposes of assisting the Town of Guilford (The Town) in fulfilling its financial accounting requirements for the Town of Guilford Public School Employees' (Non-Certified) Pension Plan (the School Plan). No attempt is being made to offer any accounting opinion or advice. This report is for the fiscal year July 1, 2017 to June 30, 2018. The reporting date for determining plan assets and obligations is June 30, 2018. The calculations enclosed in this report have been made on a basis consistent with our understanding of the plan provisions. Determinations for purposes other than meeting financial reporting requirements may be significantly different than the results contained in this report. Accordingly, additional determinations may be needed for other purposes, such as judging benefit security or meeting employer funding requirements.

In preparing this report, we relied, without audit, on information as of July 1, 2017 for census data and June 30, 2018 for the market value of assets furnished by the Town. This information includes, but is not limited to, statutory provisions, member census data, and financial information. The membership as of July 1, 2017 includes 121 active participants (includes 1 participant working for the Town), 19 terminated vested and other inactive participants, and 54 retirees and beneficiaries. Please see Milliman's July 1, 2017 actuarial valuation report dated December 22, 2017 for more information on the plan's participants as of July 1, 2017 as well as a summary of the plan provisions and a summary of the actuarial methods and assumptions used for determining the Actuarially Determined Contribution.

We performed a limited review of the census and financial information used directly in our analysis and have found them to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

We hereby certify that, to the best of our knowledge, this report, including all costs and liabilities based on actuarial assumptions and methods, is complete and accurate and determined in conformance with generally recognized and accepted actuarial principles and practices, which are consistent with the Actuarial Standards of Practice promulgated by the Actuarial Standards Board and the applicable Guides to Professional Conduct, amplifying Opinions and supporting Recommendations of the American Academy of Actuaries.

Each of the assumptions used in this valuation with the exception of those set by law was set based on industry standard published tables and data, the particular characteristics of the plan, relevant information from the plan sponsor or other sources about future expectations, and our professional judgment regarding future plan experience. We believe the assumptions are reasonable for the contingencies they are measuring, and are not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

This valuation report is only an estimate of the plan's financial condition as of a single date. It can neither predict the plan's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of plan benefits, only the timing of plan costs or contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Certification

Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as, but not limited to, 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. Due to the limited scope of the actuarial assignment, we did not perform an analysis of the potential range of such future measurements.

Milliman's work is prepared solely for the internal use and benefit of the Town of Guilford. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions: (a) the Town may provide a copy of Milliman's work, in its entirety, to the Town's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the plans; and (b) the Town may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuary is independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, I hereby certify that, to the best of my knowledge and belief, this report is complete and has been prepared in accordance with generally recognized accepted actuarial principles and practices. I am a member of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

David E. Forbes

David E. Forbes, F.S.A., E.A., M.A.A.A.
Principal and Consulting Actuary

Overview of GASB 67 and GASB 68

The Governmental Accounting Standards Board (GASB) released accounting standards for public pension plans and participating employers in 2012. These standards, GASB Statements No. 67 and 68, have substantially revised the accounting requirements previously mandated under GASB Statements No. 25 and 27. The most notable change is the distinct separation of funding from financial reporting. The Annual Required Contribution (ARC) has been eliminated under GASB 67 and 68 and is no longer relevant for financial reporting purposes. As a result, plan sponsors have been encouraged to establish a formal funding policy that is separate from financial reporting calculations.

GASB 67 applies to financial reporting for public pension plans and is effective for plan fiscal years beginning after June 15, 2013. Even if the plan does not issue standalone financial statements, but rather is considered a pension trust fund of a government, it is subject to GASB 67. Under GASB 67, enhancements to the financial statement disclosures are required, along with certain required supplementary information.

GASB 68 governs the specifics of accounting for public pension plan obligations for participating employers and is effective for employer fiscal years beginning after June 15, 2014. GASB 68 requires a liability for pension obligations, known as the Net Pension Liability, to be recognized on the balance sheets of participating employers. Changes in the Net Pension Liability will be immediately recognized as Pension Expense on the income statement or reported as deferred inflows/outflows of resources depending on the nature of the change.

Executive Summary

A. Overview

	Accounting Valuation For Fiscal Year Ending	
	June 30, 2017	June 30, 2018
Pension Expense	$1,307,233	$1,469,954
Discount Rate for Expense	7.00%	6.75%
Key Disclosure Items		
Discount Rate	6.75%	6.50%
Total Pension Liability	$16,118,406	$16,923,171
Fiduciary Net Position	$12,441,096	$12,621,245
Net Pension Liability	$3,677,310	$4,301,926
Money-Weighted Rate of Return*	7.00%	5.07%

* aggregate of Town, Police and School Plans

B. Relationship Between Valuation Date, Measurement Date, and Reporting Date

The Valuation Date is July 1, 2017. This is the date as of which the actuarial valuation is performed. The Measurement Date is June 30, 2018. This is the date as of which the Net Pension Liability is determined. The Reporting Date is June 30, 2018. This is the plan's and/or employer's fiscal year ending date. The liabilities were projected from the valuation date to the measurement date.

C. Plan Provisions

Appendix A provides a summary of all relevant plan provisions valued as of July 1, 2017 (the Valuation Date). To the best of our knowledge, there have been no significant changes in plan provsions between the Valuation Date and the fiscal year end.

Schedule of Employer Contributions

Fiscal Year Ending June 30	Actuarially Determined Contribution *	Actual Employer Contribution	Contribution Deficiency (Excess)	Projected Covered Payroll	Contribution as a % of Covered Payroll
2012	1,111,743	179,900	931,843	5,768,652	3.12%
2013	1,464,359	191,700	1,272,659	5,829,343	3.29%
2014	2,590,541	317,750	2,272,791	5,704,347	5.57%
2015	612,839	385,000	227,839	5,432,422	7.09%
2016	758,694	412,737	345,957	5,227,413	7.90%
2017	905,710	503,000	402,710	5,051,980	9.96%
2018	959,690	1,463,714 **	(504,024)	4,709,202	31.08%

* Contribution amounts for Fiscal Year Ending June 30, 2012, June 30, 2013 and June 30, 2014 are the Annual Required Contribution (ARC) under GASB 27. Employer contributions are typically paid in the plan year subsequent to the fiscal year.

** Based on contributions of $560,000 and $903,714 made on July 12, 2018 and August 8, 2018, respectively.

Statement of Fiduciary Net Position

	June 30, 2017	June 30, 2018
Assets		
Cash and cash equivalents	$561,227	$68,040
Receivables and prepaid expenses:		
Receivable contributions	0	0
Receivable investment income	0	0
Receivables from brokers for unsettled trades	0	0
Prepaid expenses	0	0
Total receivables	0	0
Investments:		
Fixed income	4,412,798	4,348,041
Stocks	7,467,071	8,205,164
Short-term investments	0	0
Real estate	0	0
Alternative investments	0	0
Total investments	11,879,869	12,553,205
Invested securities lending cash collateral	0	0
Capital assets net of accumulated depreciation	0	0
Total assets	12,441,096	12,621,245
Liabilities		
Accrued expenses and benefits payable	0	0
Securities lending cash collateral	0	0
Payable to brokers for unsettled trades	0	0
Total liabilities	0	0
Net position restricted for pensions	$12,441,096	$12,621,245

Statement of Changes in Fiduciary Net Position

	June 30, 2018
Additions	
Member contributions	$0
Employer contributions	503,000
Total contributions	503,000
Investment income (loss):	
Interest	137,061
Dividends	199,973
Equity fund income, net	0
Net increase in fair value of investments	397,010
Securities lending income	0
Less investment expenses:	
Direct investment expense	98,660
Securities lending management fees	0
Securities lending borrower rebates	0
Net investment income	635,384
Other income	547
Total additions	1,138,931
Deductions	
Service benefits	958,782
Disability benefits	N/A
Death benefits	N/A
Refunds of member contributions	N/A
Administrative expenses	0
Total deductions	958,782
Net increase (decrease)	180,149
Net position restricted for pensions	
Beginning of year (June 30, 2017)	12,441,096
End of year (June 30, 2018)	$12,621,245

Money-Weighted Rate of Return
(Aggregate of Town, Police, and School Plans)

Fiscal Year Ending June 30	Net Money-Weighted Rate of Return
2009	N/A
2010	N/A
2011	N/A
2012	N/A
2013	N/A
2014	14.12%
2015	2.17%
2016	2.82%
2017	7.00%
2018	5.07%

Calculation of Money-Weighted Rate of Return

The money-weighted rate of return considers the changing amounts actually invested during a period and weights the amount of pension plan investments by the proportion of time they are available to earn a return during that period. External cash flows are determined on a monthly basis and the benefit payments and administrative expenses are assumed to occur at the beginning of each month. External cash inflows are netted with external cash outflows, resulting in a net external cash flow in each month. The money-weighted rate of return is calculated net of investment expenses.

	Net External Cash Flows	Periods Invested	Period Weight	Net External Cash Flows With Interest
Beginning Value - July 1, 2017	$58,141,211	12.00	1.00	$61,086,642
Monthly net external cash flows:				
July	1,791,501	12.00	1.00 *	1,877,477
August	(322,540)	11.00	0.92	(337,543)
September	(159,367)	10.00	0.83	(166,040)
October	(161,854)	9.00	0.75	(167,966)
November	(194,148)	8.00	0.67	(200,684)
December	(190,898)	7.00	0.58	(196,449)
January	(168,358)	6.00	0.50	(172,570)
February	(171,335)	5.00	0.42	(174,929)
March	(317,848)	4.00	0.33	(323,074)
April	(175,014)	3.00	0.25	(177,190)
May	(428,823)	2.00	0.17	(432,441)
June	(200,750)	1.00	0.08	(201,545)
Ending Value - June 30, 2018				60,413,688
Money-Weighted Rate of Return				5.07%

* The period weight for employer contribution is based on the date the contribution was made.

Long-Term Expected Rate of Return
(Aggregate of Town, Police, and School Plans)

The best-estimate range for the long-term expected rate of return is determined by adding expected inflation to expected long-term real returns and reflecting expected volatility and correlation. The capital market assumptions are per Milliman's investment consulting practice as of June 30, 2018.

Asset Class	Representative Index	Target Allocation	Long-Term Expected Arithmetic Real Rate of Return	Long-Term Expected Geometric Real Rate of Return
US Cash	BAML 3-Mon Tbill	4.00%	0.27%	0.28%
US Short Bonds	Barclays 1-3 Yr Gvt/Credit	8.40%	1.38%	1.34%
US Interm Bonds	Barclays IT Gvt/Credit	8.40%	1.66%	1.58%
High Yield Bonds	BAML High Yield	5.00%	3.95%	3.43%
US Small & Mid Caps	Russell 2500	2.60%	5.45%	3.69%
US Large Growth	Russell 1000 Growth	21.25%	5.02%	3.55%
US Large Value	Russell 1000 Value	21.25%	4.18%	2.99%
US MidCap Value	Russell MidCap Value	12.00%	4.54%	3.11%
Global Equity	MSCI ACWI NR	6.50%	5.01%	3.68%
Emerging Markets Equity	MSCI EM NR	4.00%	7.96%	4.74%
Non-US Small Cap	MSCI EAFE Small Cap NR	2.60%	6.06%	4.28%
US REITs	FTSE NAREIT Equity REIT	4.00%	5.01%	3.25%
Assumed Inflation - Mean			2.60%	2.60%
Assumed Inflation - Standard Deviation			1.85%	1.85%
Portfolio Real Mean Return			4.11%	3.33%
Portfolio Nominal Mean Return			6.72%	6.02%
Portfolio Standard Deviation				12.54%
Long-Term Expected Rate of Return Selected by the Town for 2018/2019				**6.50%**

The assumed rates of return developed in the models are based on overall market return. As such they only represent the beta portion of investment return that might be expected from a particular class. The Pension Plan is actively managed in pursuit of additional investment return over that market-based return, which is known as alpha, and has shown a history of achieving such returns. Therefore, the assumption includes a component for this excess return.

Depletion Date Projection

GASB 67 and 68 generally require that a blended discount rate be used to measure the Total Pension Liability (the Actuarial Accrued Liability calculated using the Individual Entry Age Normal Cost Method). The long-term expected return on plan investments may be used to discount liabilities to the extent that the plan's Fiduciary Net Position (fair market value of assets) is projected to cover benefit payments and administrative expenses. A 20-year high quality (AA/Aa or higher) municipal bond rate must be used for periods where the Fiduciary Net Position is not projected to cover benefit payments and administrative expenses. Determining the discount rate under GASB 67 and 68 will often require that the actuary perform complex projections of future benefit payments and asset values. GASB 67 and 68 (paragraph 29) do allow for alternative evaluations of projected solvency, if such evaluation can reliably be made. GASB does not contemplate a specific method for making an alternative evaluation of sufficiency; it is left to professional judgment.

The following circumstances justify an alternative evaluation of sufficiency for the School Plan:

- Beginning in 2014, the contributions made by the Board of Education to the School Plan have been based on the Actuarially Determined Contribution ("ADC"). Although contributions made by the Board have been lower than the ADC for 2014-2016 plan years, they have been at least equal to the normal cost of the Plan. Furthermore, the actual contribution made for the 2017 plan year was almost $1 million greater than the previous year and was substantially greater than the corresponding ADC.

- The ADC is based on closed amortization periods and shorter periods used for layers due to actuarial gains and losses and changes in actuarial assumptions and methods beginning with the July 1, 2014 actuarial valuation. This means that payment of the ADC each year is expected to bring the plan to a 100% funded position at the close of the longest amortization period.

- GASB 67 and 68 specify that the projections regarding future solvency assume that plan assets earn the assumed rate of return and there are no future changes in the plan provisions or actuarial methods and assumptions, which means that the projections would not reflect any adverse future experience which might impact the plan's funded position.

Based on these circumstances, it is our professional opinion that the detailed depletion date projections outlined in GASB 67 and 68 will show that the Fiduciary Net Position is always projected to be sufficient to cover benefit payments and administrative expenses.

Net Pension Liability

Net Pension Liability	June 30, 2017	June 30, 2018
Total pension liability	$16,118,406	$16,923,171
Fiduciary net position	12,441,096	12,621,245
Net pension liability	3,677,310	4,301,926
Fiduciary net position as a % of total pension liability	77.19%	74.58%
Covered payroll	5,051,980	4,709,202
Net pension liability as a % of covered payroll	72.79%	91.35%

The total pension liability was determined by an actuarial valuation as of the valuation date, calculated based on the discount rate and actuarial assumptions below, and was then projected forward to the measurement date. Any significant changes during this period have been reflected as prescribed by GASB 67 and 68.

Discount Rate

Discount rate for Expense	7.00%	6.75%
Discount rate for Disclosure	6.75%	6.50%
Long-term expected rate of return, net of investment expense	7.00%	6.75%
Municipal bond rate	N/A	N/A

The plan's fiduciary net position was projected to be available to make all projected future benefit payments of current active and inactive employees. Therefore, the discount rate for calculating the total pension liability is equal to the long-term expected rate of return. The discount rate was recently decreased to 6.50% per discussions with the plan sponsor.

Other Key Actuarial Assumptions

Actuarial assumptions that determined the total pension liability as of June 30, 2018 were selected based upon the results of our analyses of plan experience as described in our reports on the 2018 Salary Increase Experience Study, 2011 Experience Study, and the 2004 Experience Study dated August 10, 2018, June 17, 2011, and June 14, 2004, respectively.

Valuation date	July 1, 2016	July 1, 2017
Measurement date	June 30, 2017	June 30, 2018
Consumer Price Index	2.60%	2.60%
Salary increases including inflation	See Appendix B	See Appendix B
Mortality	See Appendix B	See Appendix B
Actuarial cost method	Entry Age Normal	Entry Age Normal

Changes in Net Pension Liability

Changes in Net Pension Liability	Increase (Decrease) Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances as of June 30, 2017	$16,118,406	$12,441,096	$3,677,310
Changes for the year:			
Service cost	416,858		416,858
Interest on total pension liability	1,084,299		1,084,299
Effect of plan changes	0		0
Effect of economic/demographic (gains) or losses	(119,150)		(119,150)
Effect of assumptions changes or inputs	381,540		381,540
Benefit payments	(958,782)	(958,782)	0
Employer contributions		503,000	(503,000)
Member contributions		0	0
Net investment income		635,931	(635,931)
Administrative expenses		0	0
Balances as of June 30, 2018	16,923,171	12,621,245	4,301,926

Sensitivity Analysis

The following presents the net pension liability, calculated using the discount rate of 6.50%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1 percentage point lower (5.50%) or 1 percentage point higher (7.50%) than the current rate.

	1% Decrease 5.50%	Current Discount Rate 6.50%	1% Increase 7.50%
Total pension liability	$18,804,009	$16,923,171	$15,318,831
Fiduciary net position	12,621,245	12,621,245	12,621,245
Net pension liability	6,182,764	4,301,926	2,697,586

Schedule of Changes in Net Pension Liability and Related Ratios
(in 1,000s)

	Fiscal Year Ending June 30									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total Pension Liability										
Service cost	$417	$417	$376	$386	$414	N/A	N/A	N/A	N/A	N/A
Interest on total pension liability	1,084	1,041	921	873	823	N/A	N/A	N/A	N/A	N/A
Effect of plan changes	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A
Effect of economic/demographic gains or (losses)	(119)	362	(115)	126	0	N/A	N/A	N/A	N/A	N/A
Effect of assumption changes or inputs	382	314	1,269	0	2	N/A	N/A	N/A	N/A	N/A
Benefit payments	(959)	(935)	(617)	(514)	(788)	N/A	N/A	N/A	N/A	N/A
Net change in total pension liability	805	1,200	1,834	871	451	N/A	N/A	N/A	N/A	N/A
Total pension liability, beginning	16,118	14,919	13,085	12,214	11,763	N/A	N/A	N/A	N/A	N/A
Total pension liability, ending (a)	16,923	16,118	14,919	13,085	12,214	N/A	N/A	N/A	N/A	N/A
Fiduciary Net Position										
Employer contributions	$503	$413	$385	$318	$192	N/A	N/A	N/A	N/A	N/A
Member contributions	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A
Investment income net of investment expenses	636	859	347	184	1,502	N/A	N/A	N/A	N/A	N/A
Benefit payments	(959)	(935)	(617)	(514)	(788)	N/A	N/A	N/A	N/A	N/A
Administrative expenses	0	0	(12)	(7)	0	N/A	N/A	N/A	N/A	N/A
Net change in plan fiduciary net position	180	337	102	(19)	906	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, beginning	12,441	12,104	12,002	12,021	11,115	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, ending (b)	12,621	12,441	12,104	12,002	12,021	N/A	N/A	N/A	N/A	N/A
Net pension liability, ending = (a) - (b)	$4,302	$3,677	$2,814	$1,083	$194	N/A	N/A	N/A	N/A	N/A
Fiduciary net position as a % of total pension liability	74.58%	77.19%	81.13%	91.72%	98.41%	N/A	N/A	N/A	N/A	N/A
Covered payroll	$4,709	$5,052	$5,227	$5,432	$5,704	N/A	N/A	N/A	N/A	N/A
Net pension liability as a % of covered payroll	91.35%	72.79%	53.84%	19.94%	3.40%	N/A	N/A	N/A	N/A	N/A

This schedule is presented to illustrate the requirement to show information for 10 years. However, recalculations of prior years are not required, and if prior years are not reported in accordance with the current GASB standards, they should not be reported.

Pension Expense

Pension Expense	July 1, 2016 to June 30, 2017	July 1, 2017 to June 30, 2018
Service cost	$417,287	$416,858
Interest on total pension liability	1,041,358	1,084,299
Effect of plan changes	0	0
Administrative expenses	0	0
Member contributions	0	0
Expected investment return net of investment expenses	(842,966)	(840,648)
Recognition of Deferred Inflows/Outflows of Resources		
Recognition of economic/demographic gains or losses	96,355	61,414
Recognition of assumption changes or inputs	366,665	478,554
Recognition of investment gains or losses	228,534	269,477
Pension Expense	1,307,233	1,469,954

As of June 30, 2018, the deferred inflows and outflows of resources are as follows:

Deferred Inflows / Outflows of Resources	Deferred Inflows of Resouces	Deferred Outflows of Resouces
Differences between expected and actual experience	($122,635)	$194,864
Changes of assumptions	0	837,427
Net Difference between projected and actual earnings	0	485,593
Contributions made subsequent to measurement date	0	0
Total	(122,635)	1,517,884

Amounts currently reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Year ended June 30:	
2019	$809,443
2020	475,539
2021	69,322
2022	40,945
2023	0
Thereafter*	0

* Note that additional future deferred inflows and outflows of resources may impact these numbers.

Schedule of Deferred Inflows and Outflows of Resources

	Original Amount	Date Established	Original Rec. Period*	Amount Recognized in Pension Expense for FYE 06/30/2018	Amount Recognized in Pension Expense through 06/30/2018	Balance of Deferred Inflows as of 06/30/2018	Balance of Deferred Outflows as of 06/30/2018
Economic/ demographic gains or losses	($119,150)	6/30/2018	3.41	($34,941)	($34,941)	($84,209)	$0
	361,689	6/30/2017	3.71	97,490	194,980	0	166,709
	(115,277)	6/30/2016	4.50	(25,617)	(76,851)	(38,426)	0
	126,083	6/30/2015	5.15	24,482	97,928	0	28,155
		Total		61,414	181,116	(122,635)	194,864
Assumption changes or inputs	381,540	6/30/2018	3.41	111,889	111,889	0	269,651
	314,087	6/30/2017	3.71	84,660	169,320	0	144,767
	1,269,024	6/30/2016	4.50	282,005	846,015	0	423,009
		Total		478,554	1,127,224	0	837,427
Investment gains or losses	204,717	6/30/2018	5.00	40,943	40,943	0	163,774
	(15,843)	6/30/2017	5.00	(3,169)	(6,338)	(9,505)	0
	498,111	6/30/2016	5.00	99,622	298,866	0	199,245
	660,403	6/30/2015	5.00	132,081	528,324	0	132,079
		Total		269,477	861,795		485,593
Total deferred from economic/demographic gains or losses and assumption changes or inputs						(122,635)	1,032,291
Total deferred from investment gains or losses						0	485,593
Total deferred from all sources						(122,635)	1,517,884
Net amount deferred							1,395,249

* Investment (gains)/losses are recognized in pension expense over a period of five years; economic/demographic (gains)/losses and assumption changes or inputs are recognized over the average remaining service life for all active and inactive members.

Balance Reconciliation

	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability	Deferred (Inflows)	Deferred Outflows	Net Investment (Inflows)/ Outflows	Net Deferrals	Net Pension Liability plus Net Deferrals	Annual Expense
Balances as of June 30, 2017	($16,118,406)	$12,441,096	($3,677,310)	($64,043)	$1,251,277	$550,353	$1,737,587	($1,939,723)	
Service cost	(416,858)		(416,858)						416,858
Interest on total pension liability	(1,084,299)		(1,084,299)						1,084,299
Effect of plan changes	0		0						0
Effect of liability gains or losses	119,150		119,150	(119,150)			(119,150)		
Effect of assumption changes or inputs	(381,540)		(381,540)		381,540		381,540		
Benefit payments	958,782	(958,782)	0						
Administrative expenses		0	0						0
Member contributions		0	0						0
Expected net investment income		840,648	840,648						(840,648)
Investment gains or losses		(204,717)	(204,717)			204,717	204,717		
Employer contributions		503,000	503,000					503,000	
Recognition of liability gains or losses				60,558	(121,972)		(61,414)		61,414
Recognition of assumption changes or inputs					(478,554)		(478,554)		478,554
Recognition of investment gains or losses						(269,477)	(269,477)		269,477
Annual expense								(1,469,954)	1,469,954
Balances as of June 30, 2018	(16,923,171)	12,621,245	(4,301,926)	(122,635)	1,032,291	485,593	1,395,249	(2,906,677)	

Glossary

Actuarially Determined Contribution
A target or recommended contribution to a defined benefit pension plan for the reporting period, determined based on the funding policy and most recent measurement available when the contribution for the reporting period was adopted.

Deferred Inflows/Outflows of Resources
Portion of changes in net pension liability that is not immediately recognized in Pension Expense. These changes include differences between expected and actual experience, changes in assumptions, and differences between expected and actual earnings on plan investments.

Discount Rate
Single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the sum of:

1) The actuarial present value of benefit payments projected to be made in future periods where the plan assets are projected to be sufficient to meet benefit payments, calculated using the Long-Term Expected Rate of Return.
2) The actuarial present value of projected benefit payments not included in (1), calculated using the Municipal Bond Rate.

Fiduciary Net Position
Equal to market value of assets.

Long-Term Expected Rate of Return
Long-term expected rate of return on pension plan investments expected to be used to finance the payment of benefits, net of investment expenses.

Money-Weighted Rate of Return
The internal rate of return on pension plan investments, net of investment expenses.

Municipal Bond Rate
Yield or index rate for 20-year, tax-exempt general obligation municipal bonds with an average rating of AA/Aa or higher.

Net Pension Liability
Total Pension Liability minus the Plan's Fiduciary Net Position (unfunded accrued liability).

Projected Benefit Payments
All benefits estimated to be payable through the pension plan to current active and inactive employees as a result of their past service and expected future service.

Service Cost
The portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

Total Pension Liability
The portion of actuarial present value of projected benefit payments that is attributable to past periods of member service using the Entry Age Normal cost method based on the requirements of GASB 67 and 68.

Appendix A

Summary of Principal Plan Provisions

Basic Information

Plan Name: Town of Guilford Public School Employees'(Non-Certified) Pension Plan.

Effective Date of Plan: October 1, 1990 and as further amended through July 1, 2018.

Plan year: July 1 – June 30.

Eligibility: All full-time employees of the school system are eligible, excluding the instructional and supervisory staff. School year secretaries, school classroom aides, school cafeteria workers and school nurses/health aides shall be considered full time employees provided their regular work week is for thirty (30) or more hours and their regular period of employment is for 180 days per year.

Credited Service: Credited service is to be reckoned in completed months. Years and twelfths of a year are used in calculating any pension. Absences and sickness lasting less than twelve months with approval are counted. Absence for military service receives automatic approval if the employee returns to the School's employ immediately thereafter. Elected officials' service need not be continuous.

Service with other municipalities counts provided there is no break between such service and service with the School, such service does not exceed service under this Plan and such service has not entitled the employee to a vested pension right.

Employee Contributions: None, effective July 1, 1988.

Compensation Base: Average of annual straight-time earnings during the period of five consecutive calendar years when such earnings were the highest. For certain job classifications, average of annual straight-time earnings during the period of four consecutive calendar years when such earnings were by the highest.

Benefit Formulas and Eligibilities

Normal Retirement Eligibility: Normal retirement age is the later of age 65 or 5 years of participation. An employee with 10 years of Credited Service may retire with an unreduced pension at age 60. However, if an employee wishes to continue working after his normal retirement date he may do so. During these added years of employment, the employee will continue to participate in the pension fund and this time will continue to his years of service.

Normal Retirement Benefit: 1.5% of compensation base of employee, multiplied by the number of years (and monthly fractions) of credited service at retirement. For most participants, the compensation base is an average of the employee's best four consecutive calendar years. However, for certain positions, the compensation base is the average earnings received during the highest-paid five consecutive years of employment.

Early Retirement: The employee with 10 years or more of service may retire and may elect to receive benefits at any time after age 55. Benefits are reduced actuarially for each month of payment before the age of 60.

Disability Benefit: Employee entitled to disability benefits after 10 years of service based on formula set forth above.

Termination of Employment: An employee whose employment terminates after completion of 10 years of credited service will be entitled to a pension commencing on his Normal Retirement Date.

Dependent Spouse's Benefit: If an employee should die in service after completion of 10 or more years of service, his dependent spouse shall receive a pension for life in the amount of half the pension to which the deceased employee would have been entitled if he had become disabled on the date of his death.

Joint and Survivor Option: On or prior to retirement, an employee may elect, in lieu of the normal pension, an actuarially equivalent smaller pension payable for his lifetime with any given portion of the pension to continue during the life of his surviving spouse.

Optional Forms of Benefits: Lump sum. For purposes of determining the amount of retirement income payable in a lump sum distribution, a 30-year treasury rate published in June, compounded annually and mortality rates in accordance with GAR2002 shall be used.

Cost-of-Living Increase: Retired employees have received cost-of-living increases in their benefits several times since 1991. The latest increase provides all retired employees in receipt of a pension benefit as of December 31, 2005 with a 4.0% cost-of-living increase (with a monthly $15 minimum benefit) beginning July 1, 2008. Those who retired during 2006 received a 2.5% increase (with no minimum) beginning July 1, 2008. No adjustment was made to the pension of those who retired between 2007 and 2016.

Financing Medium: Trust Fund

Administration: Plan is administered by Pension Committee.

Trustee: Wells Fargo

Amendment and Termination: The plan may be amended or terminated at any time by the Town. No amendment can reduce accrued employee benefits below the amount that would have been provided by the Trust Fund if the plan had been terminated as of the date of amendment. On termination, the Trust Fund would be used to pay benefits in accordance with a system of priorities as set forth in the Plan.

Termination of Plan: Limitations on distributions to higher paid employees are provided in accordance with Treasury requirements.

Changes in Plan Provisions: There have been no changes in plan provisions since the previous valuation.

Appendix B

Summary of Actuarial Methods and Assumptions

Actuarial Methods

Actuarial Cost Method: The ultimate cost of a pension plan is the total amount needed to provide benefits for plan members and beneficiaries and to pay the expenses of administering the plan. Pension costs are met by contributions and by any investment return on plan assets.

Ultimate Cost	=	Benefits Paid	+	Expenses Incurred	-	Investment Return

The true cost of a pension plan will ultimately be determined by the excess of benefits actually paid and the expenses incurred in its administration over investment income earned on monies set aside for its funding. Thus, the ultimate cost of a plan cannot be known until the last payment has been made to its last participant. The actuarial cost method is the technique adopted by the actuary for establishing the amount and incidence of annual actuarial costs. The actuarial cost method determines the portion of the ultimate cost of a pension plan, which should be allocated to each plan year (known as the normal cost). The cost method is thus a budgeting tool, which helps to ensure that the pension plan will be adequately and systematically funded.

The annual costs for a pension plan can be determined using any one of several actuarial cost methods. The methods differ in how much of the ultimate cost of the plan is assigned to each prior year, the current year and to each future year. Although the ultimate cost for a pension plan will be determined not by the cost method but by the benefits and expenses which become payable and the earnings which are obtained on the investments of the plan, the pattern of annual contributions from year to year and the rate of funding for the benefits will vary with the choice of actuarial cost method. In addition, the choice of actuarial assumptions for a given actuarial cost method will affect the current level of contributions and pattern of future contributions.

The actuarial cost method is the entry age normal cost method.

The investment (gains)/losses are recognized in pension expense over a period of five years and economic/demographic (gains)/losses and assumption changes or inputs are recognized over the average remaining service life for all active and inactive members. For purposes of determining the average, the remaining service life of an inactive member is zero.

Actuarial Asset Valuation Method: Market Value of Assets

Actuarial Assumptions

Actuarial assumptions were selected based upon the results of our analyses of plan experience as described in our reports on the 2018 Salary Increase Experience Study, 2011 Experience Study, and the 2004 Experience Study dated August 10, 2018, June 17, 2011, and June 14, 2004, respectively.

Net Investment Yield:

For Disclosure: An average investment yield of 6.50% per year compounded annually was anticipated for the pension fund. This assumption is consistent with the Plan's target asset allocation, assumed investment expenses, and reflects inflation of 2.60% as indicated below. This assumption represents an estimate of future experience and is based on both historical returns and projections.

For Expense: An average investment yield of 6.75% per year compounded annually was anticipated for the pension fund. This assumption is consistent with the Plan's target asset allocation, assumed investment expenses, and reflects inflation of 2.60% as indicated below. This assumption represents an estimate of future experience and is based on both historical returns and projections.

> **Rationale:** In developing the investment return assumption, we reviewed historical investment performance along with forward-looking data such as projections of inflation and total return growth. Mean returns, standard deviations and correlations between investment categories were determined and used in the investment return assumption in conjunction with the historical and projected information. The plan is actively managed in pursuit of additional investment return over market-based return and has shown a significant history of achieving such returns. Therefore, the assumption includes a component for this excess return (alpha).

Consumer Price Index (CPI): 2.60% compounded. This assumption represents an estimate of future experience and is based in part on observations of estimates inherent in market data.

> **Rationale:** We utilized the inflation rate used by OASDI actuaries in its latest forecasts for the Social Security Trust Fund.

Salary Increases: 2.75%

> **Rationale:** This assumption was selected based upon the results of our analyses of plan experience as described in our reports on the 2018 Salary Increase Experience Study dated August 10, 2018.

Expense Provision: None.

> **Rationale:** The administrative expenses are not paid from the plan's assets.

Demographic Assumptions

Mortality for Healthy Employees:

Disclosure: RP-2006 Total Employee and Healthy Annuitant Tables, projected with Scale MP-2018 for males and females

Expense: RP-2006 Total Employee and Healthy Annuitant Tables, projected with Scale MP-2017 for males and females

Rationale: This assumption was selected based upon a review of the Mortality Improvement Scale MP-2018 published by the Society of Actuaries.

Mortality Disabled Employees:

Disclosure: RP2006 Disabled Mortality Table, projected with Scale MP-2018 for males and females

Expense: RP2006 Disabled Mortality Table, projected with Scale MP-2017 for males and females

Rationale: This assumption was selected based upon a review of the Mortality Improvement Scale MP-2018 published by the Society of Actuaries.

Disability: None.

Rationale: No incidence reported for disability during past years.

Severance: Select and ultimate withdrawal rates were anticipated in the valuation. For participants with less than 5 years of service, termination rates of 12% per year for males and 4% per year for females were anticipated. For participants with more than 5 or more years of service, representative termination rates per 1,000 employees are presented below:

Age	Male Rate	Female Rate
25	60.00	200.00
35	20.00	63.00
45	10.00	18.00
55	0.80	7.00

Rationale: This assumption was selected based upon the results of our analyses of plan experience as described in our reports on the 2011 Experience Study dated June 17, 2011.

Retirement: For school employees, expected incidence of all retirements (normal, early, or disability) per 1,000 lives used in valuation is shown below at ages for each gender:

Attained Age	Males	Females
55	9.00	36.00
56-57	10.00	40.00
58-59	12.50	50.00
60	100.00	400.00
61-64	50.00	200.00
65-69	500.00	500.00
70	1000.00	1000.00

Terminated Vested participants are assumed to commence benefits at the earliest age at which unreduced benefits are available.

Rationale: This assumption was selected based upon the results of our analyses of plan experience as described in our reports on the 2011 Experience Study dated June 17, 2011.

Percentage Married: 80% of participants are assumed to be married with females three years younger than males.

Rationale: The number of covered participants is not large enough to have credible experience for preretirement deaths. We believe the marriage assumption selected is reasonable for the contingency it is measuring and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

Form of Payment: Single Life Annuity.

Rationale: We believe the form of payment assumption selected is reasonable for the contingency it is measuring and is not anticipated to produce significant cumulative actuarial gains or losses over the measurement period.

Changes in Assumptions:

The following assumptions were changed at the time of disclosure:

1) The projection scale for mortality table was changed from MP-2017 to MP-2018.

2) The Net Investment Yield was changed from 6.75% to 6.50%.