TOWN OF GUILFORD EMPLOYEES' PENSION PLAN AND POLICE RETIREMENT FUND

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 Employees' Pension Plan (the Town Plan) and the Town of Guilford Police Retirement Fund (the Police 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 105 active participants, 14 terminated vested and other inactive participants, and 21 retirees and beneficiaries for the Town Plan. The membership as of July 1, 2017 includes 25 active participants, 1 terminated vested, and 47 retirees and beneficiaries for the Police Plan. Please see Milliman's July 1, 2017 actuarial valuation report dated December 22, 2017 for more information on the plans' 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

Town Pension Plan	Accounting Valuation For Fiscal Year Ending June 30, 2017	June 30, 2018
Pension Expense	$1,608,971	$1,610,136
Discount Rate for Expense	7.00%	6.75%
Key Disclosure Items		
Discount Rate	6.75%	6.50%
Total Pension Liability	$27,380,700	$29,561,775
Fiduciary Net Position	$23,440,933	$25,124,277
Net Pension Liability	$3,939,767	$4,437,498
Police Pension Plan		
Pension Expense	$1,799,972	$1,796,837
Discount Rate for Expense	7.00%	6.75%
Key Disclosure Items		
Discount Rate	6.75%	6.50%
Total Pension Liability	$26,337,015	$27,399,430
Fiduciary Net Position	$22,259,182	$22,668,166
Net Pension Liability	$4,077,833	$4,731,264
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 and Appendix B provide summaries 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 provisions between the Valuation Date and the fiscal year end.

Schedule of Employer Contributions
For the Town Plan

Fiscal Year Ending June 30	Actuarially Determined Contribution *	Actual Employer Contribution		Contribution Deficiency (Excess)	Projected Covered Payroll	Contribution as a % of Covered Payroll
2012	1,389,372	1,182,110		207,262	7,062,460	16.74%
2013	1,618,778	1,618,778		0	7,300,660	22.17%
2014	1,597,718	1,580,742		16,976	7,320,654	21.59%
2015	957,362	957,362		0	7,184,431	13.33%
2016	1,014,989	1,014,989		0	7,286,617	13.93%
2017	949,847	949,847		0	7,188,230	13.21%
2018	1,123,550	1,123,550	**	0	5,606,594	20.04%

* 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 a contribution of $1,123,550 made on July 17, 2018.

Statement of Fiduciary Net Position
For the Town Plan

	June 30, 2017	June 30, 2018
Assets		
Cash and cash equivalents	$1,057,435	$135,443
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	8,314,392	8,655,357
Stocks	14,069,106	16,333,477
Short-term investments	0	0
Real estate	0	0
Alternative investments	0	0
Total investments	22,383,498	24,988,834
Invested securities lending cash collateral	0	0
Capital assets net of accumulated depreciation	0	0
Total assets	23,440,933	25,124,277
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	$23,440,933	$25,124,277

Statement of Changes in Fiduciary Net Position
For the Town Plan

	June 30, 2018
Additions	
Member contributions	$316,420
Employer contributions	949,847
Total contributions	1,266,267
Investment income (loss):	
Interest	258,246
Dividends	376,781
Equity fund income, net	0
Net increase in fair value of investments	748,028
Securities lending income	0
Less investment expenses:	
Direct investment expense	185,891
Securities lending management fees	0
Securities lending borrower rebates	0
Net investment income	1,197,164
Other income	1,030
Total additions	2,464,461
Deductions	
Service benefits	781,117
Disability benefits	N/A
Death benefits	N/A
Refunds of member contributions	N/A
Administrative expenses	0
Total deductions	781,117
Net increase (decrease)	1,683,344
Net position restricted for pensions	
Beginning of year (June 30, 2017)	23,440,933
End of year (June 30, 2018)	$25,124,277

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
For the Town Plan

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 Plan:

- For the past several years, the Town of Guilford has made contributions to the Plan that are equal to the Actuarially Determined Contribution ("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, 2003 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
For the Town Plan

Net Pension Liability	June 30, 2017	June 30, 2018
Total pension liability	$27,380,700	$29,561,775
Fiduciary net position	23,440,933	25,124,277
Net pension liability	3,939,767	4,437,498
Fiduciary net position as a % of total pension liability	85.61%	84.99%
Covered payroll*	7,188,230	5,606,594
Net pension liability as a % of covered payroll	54.81%	79.15%

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.

** Covered payroll is increased by assumed overtime of 20% for the IAFF group and 0% for the other groups for the year ending June 30, 2017 and June 30, 2018, respectively.*

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 C	See Appendix C
Mortality	See Appendix C	See Appendix C
Actuarial cost method	Entry Age Normal	Entry Age Normal

Changes in Net Pension Liability
For the Town Plan

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	$27,380,700	$23,440,933	$3,939,767
Changes for the year:			
Service cost	777,783		777,783
Interest on total pension liability	1,874,765		1,874,765
Effect of plan changes	0		0
Effect of economic/demographic (gains) or losses	(352,524)		(352,524)
Effect of assumptions changes or inputs	662,168		662,168
Benefit payments	(781,117)	(781,117)	0
Employer contributions		949,847	(949,847)
Member contributions		316,420	(316,420)
Net investment income		1,198,194	(1,198,194)
Administrative expenses		0	0
Balances as of June 30, 2018	29,561,775	25,124,277	4,437,498

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	$33,319,368	$29,561,775	$26,425,616
Fiduciary net position	25,124,277	25,124,277	25,124,277
Net pension liability	8,195,091	4,437,498	1,301,339

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

	Fiscal Year Ending June 30									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total Pension Liability										
Service cost	$778	$842	$779	$754	$722	N/A	N/A	N/A	N/A	N/A
Interest on total pension liability	1,875	1,781	1,431	1,364	1,326	N/A	N/A	N/A	N/A	N/A
Effect of plan changes	0	86	697	0	0	N/A	N/A	N/A	N/A	N/A
Effect of economic/demographic gains or (losses)	(353)	(256)	380	447	0	N/A	N/A	N/A	N/A	N/A
Effect of assumption changes or inputs	662	518	2,064	0	6	N/A	N/A	N/A	N/A	N/A
Benefit payments	(781)	(380)	(430)	(1,936)	(2,220)	N/A	N/A	N/A	N/A	N/A
Net change in total pension liability	2,181	2,591	4,919	629	(165)	N/A	N/A	N/A	N/A	N/A
Total pension liability, beginning	27,381	24,790	19,871	19,241	19,407	N/A	N/A	N/A	N/A	N/A
Total pension liability, ending (a)	29,562	27,381	24,790	19,871	19,241	N/A	N/A	N/A	N/A	N/A
Fiduciary Net Position										
Employer contributions	$950	$1,015	$957	$1,581	$1,619	N/A	N/A	N/A	N/A	N/A
Member contributions	316	336	291	239	232	N/A	N/A	N/A	N/A	N/A
Investment income net of investment expenses	1,198	1,489	567	298	2,359	N/A	N/A	N/A	N/A	N/A
Benefit payments	(781)	(380)	(430)	(1,936)	(2,220)	N/A	N/A	N/A	N/A	N/A
Administrative expenses	0	0	(20)	(11)	0	N/A	N/A	N/A	N/A	N/A
Net change in plan fiduciary net position	1,683	2,459	1,365	171	1,990	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, beginning	23,441	20,982	19,617	19,446	17,456	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, ending (b)	25,124	23,441	20,982	19,617	19,446	N/A	N/A	N/A	N/A	N/A
Net pension liability, ending = (a) - (b)	$4,437	$3,940	$3,808	$254	($204)	N/A	N/A	N/A	N/A	N/A
Fiduciary net position as a % of total pension liability	84.99%	85.61%	84.64%	98.72%	101.06%	N/A	N/A	N/A	N/A	N/A
Covered payroll	$5,607	$7,188	$7,287	$7,184	$7,321	N/A	N/A	N/A	N/A	N/A
Net pension liability as a % of covered payroll	79.15%	54.81%	52.26%	3.54%	-2.79%	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
For the Town Plan

Pension Expense	July 1, 2016 to June 30, 2017	July 1, 2017 to June 30, 2018
Service cost	$841,660	$777,783
Interest on total pension liability	1,781,139	1,874,765
Effect of plan changes	86,039	0
Administrative expenses	0	0
Member contributions	(335,570)	(316,420)
Expected investment return net of investment expenses	(1,535,832)	(1,628,051)
Recognition of Deferred Inflows/Outflows of Resources		
Recognition of economic/demographic gains or losses	62,496	11,773
Recognition of assumption changes or inputs	304,263	399,539
Recognition of investment gains or losses	404,776	490,747
Pension Expense	1,608,971	1,610,136

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	($493,305)	$491,136
Changes of assumptions	0	2,301,255
Net Difference between projected and actual earnings	0	940,865
Contributions made subsequent to measurement date	0	0
Total	(493,305)	3,733,256

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	$902,060
2020	680,054
2021	506,714
2022	497,285
2023	400,106
Thereafter*	253,732

* 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	($352,524)	06/30/2018	6.95	($50,723)	($50,723)	($301,801)	$0
	(256,202)	06/30/2017	7.92	(32,349)	(64,698)	(191,504)	0
	379,533	06/30/2016	8.64	43,927	131,781	0	247,752
	447,056	06/30/2015	8.78	50,918	203,672	0	243,384
		Total		11,773	220,032	(493,305)	491,136
Assumption changes or inputs	662,168	06/30/2018	6.95	95,276	95,276	0	566,892
	518,184	06/30/2017	7.92	65,427	130,854	0	387,330
	2,063,541	06/30/2016	8.64	238,836	716,508	0	1,347,033
		Total		399,539	942,638	0	2,301,255
Investment gains or losses	429,857	06/30/2018	5.00	85,971	85,971	0	343,886
	47,151	06/30/2017	5.00	9,430	18,860	0	28,291
	866,709	06/30/2016	5.00	173,342	520,026	0	346,683
	1,110,021	06/30/2015	5.00	222,004	888,016	0	222,005
		Total		490,747	1,512,873		940,865
Total deferred from economic/demographic gains or losses and assumption changes or inputs						(493,305)	2,792,391
Total deferred from investment gains or losses						0	940,865
Total deferred from all sources						(493,305)	3,733,256
Net amount deferred							3,239,951

* 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 for the Town Plan

	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	($27,380,700)	$23,440,933	($3,939,767)	($223,853)	$2,624,607	$1,001,755	$3,402,509	($537,258)	
Service cost	(777,783)		(777,783)						777,783
Interest on total pension liability	(1,874,765)		(1,874,765)						1,874,765
Effect of plan changes	0		0						0
Effect of liability gains or losses	352,524		352,524	(352,524)			(352,524)		
Effect of assumption changes or inputs	(662,168)		(662,168)		662,168		662,168		
Benefit payments	781,117	(781,117)	0						
Administrative expenses		0	0						0
Member contributions		316,420	316,420						(316,420)
Expected net investment income		1,628,051	1,628,051						(1,628,051)
Investment gains or losses		(429,857)	(429,857)			429,857	429,857		
Employer contributions		949,847	949,847					949,847	
Recognition of liability gains or losses				83,072	(94,845)		(11,773)		11,773
Recognition of assumption changes or inputs					(399,539)		(399,539)		399,539
Recognition of investment gains or losses						(490,747)	(490,747)		490,747
Annual expense								(1,610,136)	1,610,136
Balances as of June 30, 2018	(29,561,775)	25,124,277	(4,437,498)	(493,305)	2,792,391	940,865	3,239,951	(1,197,547)	

Schedule of Employer Contributions
For the Police Plan

Fiscal Year Ending June 30	Actuarially Determined Contribution *	Actual Employer Contribution		Contribution Deficiency (Excess)	Projected Covered Payroll	Contribution as a % of Covered Payroll
2012	1,668,374	1,668,374		0	2,829,027	58.97%
2013	1,833,365	1,833,365		0	3,087,422	59.38%
2014	1,688,800	1,688,800		0	3,063,365	55.13%
2015	785,553	785,553		0	3,151,421	24.93%
2016	437,809	437,809		0	2,913,282	15.03%
2017	670,238	670,238	**	0	2,453,338	27.32%
2018	797,029	797,029	***	0	2,344,354	34.00%

* 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.

** Actual amount contributed was changed from prior year report.

*** Based on a contribution of $797,029 made on July 17, 2018.

Statement of Fiduciary Net Position
For the Police Plan

	June 30, 2017	June 30, 2018
Assets		
Cash and cash equivalents	$1,004,126	$122,203
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	7,895,229	7,809,222
Stocks	13,359,827	14,736,741
Short-term investments	0	0
Real estate	0	0
Alternative investments	0	0
Total investments	21,255,056	22,545,963
Invested securities lending cash collateral	0	0
Capital assets net of accumulated depreciation	0	0
Total assets	22,259,182	22,668,166
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	$22,259,182	$22,668,166

Statement of Changes in Fiduciary Net Position
For the Police Plan

	June 30, 2018
Additions	
Member contributions	$184,889
Employer contributions	670,238
Total contributions	855,127
Investment income (loss):	
Interest	245,227
Dividends	357,786
Equity fund income, net	0
Net increase in fair value of investments	710,317
Securities lending income	0
Less investment expenses:	
Direct investment expense	176,519
Securities lending management fees	0
Securities lending borrower rebates	0
Net investment income	1,136,811
Other income	979
Total additions	1,992,917
Deductions	
Service benefits	1,583,933
Disability benefits	N/A
Death benefits	N/A
Refunds of member contributions	N/A
Administrative expenses	0
Total deductions	1,583,933
Net increase (decrease)	408,984
Net position restricted for pensions	
Beginning of year (June 30, 2017)	22,259,182
End of year (June 30, 2018)	$22,668,166

Depletion Date Projection
For the Police Plan

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 Plan:

- For the past several years, the Town of Guilford has made contributions to the Plan that are equal to the Actuarially Determined Contribution ("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, 2003 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
For the Police Plan

Net Pension Liability	**June 30, 2017**	**June 30, 2018**
Total pension liability	$26,337,015	$27,399,430
Fiduciary net position	22,259,182	22,668,166
Net pension liability	4,077,833	4,731,264
Fiduciary net position as a % of total pension liability	84.52%	82.73%
Covered payroll*	2,453,338	2,344,354
Net pension liability as a % of covered payroll	166.22%	201.82%

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.

** Covered payroll is increased by assumed overtime of 20% for overtime payments for the year ending June 30, 2017 and June 30, 2018, respectively.*

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 C	See Appendix C
Mortality	See Appendix C	See Appendix C
Actuarial cost method	Entry Age Normal	Entry Age Normal

Changes in Net Pension Liability
For the Police Plan

Changes in Net Pension Liability	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
	Increase (Decrease)		
Balances as of June 30, 2017	$26,337,015	$22,259,182	$4,077,833
Changes for the year:			
Service cost	401,606		401,606
Interest on total pension liability	1,752,272		1,752,272
Effect of plan changes	0		0
Effect of economic/demographic (gains) or losses	(148,499)		(148,499)
Effect of assumptions changes or inputs	640,969		640,969
Benefit payments	(1,583,933)	(1,583,933)	0
Employer contributions		670,238	(670,238)
Member contributions		184,889	(184,889)
Net investment income		1,137,790	(1,137,790)
Administrative expenses		0	0
Balances as of June 30, 2018	27,399,430	22,668,166	4,731,264

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	$30,622,951	$27,399,430	$24,722,533
Fiduciary net position	22,668,166	22,668,166	22,668,166
Net pension liability	7,954,785	4,731,264	2,054,367

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

	Fiscal Year Ending June 30									
	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Total Pension Liability										
Service cost	$402	$355	$367	$387	$331	N/A	N/A	N/A	N/A	N/A
Interest on total pension liability	1,752	1,707	1,590	1,529	1,405	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)	(148)	515	(122)	846	0	N/A	N/A	N/A	N/A	N/A
Effect of assumption changes or inputs	641	447	1,103	0	3	N/A	N/A	N/A	N/A	N/A
Benefit payments	(1,584)	(1,399)	(1,120)	(927)	(888)	N/A	N/A	N/A	N/A	N/A
Net change in total pension liability	1,062	1,624	1,818	1,835	849	N/A	N/A	N/A	N/A	N/A
Total pension liability, beginning	26,337	24,713	22,895	21,060	20,211	N/A	N/A	N/A	N/A	N/A
Total pension liability, ending (a)	27,399	26,337	24,713	22,895	21,060	N/A	N/A	N/A	N/A	N/A
Fiduciary Net Position										
Employer contributions	$670	$438	$786	$1,689	$1,833	N/A	N/A	N/A	N/A	N/A
Member contributions	185	186	202	212	195	N/A	N/A	N/A	N/A	N/A
Investment income net of investment expenses	1,138	1,526	608	304	2,220	N/A	N/A	N/A	N/A	N/A
Benefit payments	(1,584)	(1,399)	(1,120)	(927)	(888)	N/A	N/A	N/A	N/A	N/A
Administrative expenses	0	0	(21)	(11)	0	N/A	N/A	N/A	N/A	N/A
Net change in plan fiduciary net position	409	751	455	1,266	3,360	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, beginning	22,259	21,509	21,054	19,787	16,428	N/A	N/A	N/A	N/A	N/A
Fiduciary net position, ending (b)	22,668	22,259	21,509	21,054	19,787	N/A	N/A	N/A	N/A	N/A
Net pension liability, ending = (a) - (b)	$4,731	$4,078	$3,204	$1,841	$1,273	N/A	N/A	N/A	N/A	N/A
Fiduciary net position as a % of total pension liability	82.73%	84.52%	87.03%	91.96%	93.96%	N/A	N/A	N/A	N/A	N/A
Covered payroll	$2,344	$2,453	$2,913	$3,151	$3,063	N/A	N/A	N/A	N/A	N/A
Net pension liability as a % of covered payroll	201.82%	166.22%	109.99%	58.43%	41.54%	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
For the Police Plan

Pension Expense	July 1, 2016 to June 30, 2017	July 1, 2017 to June 30, 2018
Service cost	$354,833	$401,606
Interest on total pension liability	1,706,595	1,752,272
Effect of plan changes	0	0
Administrative expenses	0	0
Member contributions	(186,195)	(184,889)
Expected investment return net of investment expenses	(1,493,461)	(1,499,243)
Recognition of Deferred Inflows/Outflows of Resources		
Recognition of economic/demographic gains or losses	420,983	138,885
Recognition of assumption changes or inputs	592,358	711,056
Recognition of investment gains or losses	404,859	477,150
Pension Expense	1,799,972	1,796,837

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	($83,934)	$120,325
Changes of assumptions	0	466,809
Net Difference between projected and actual earnings	0	858,419
Contributions made subsequent to measurement date	0	0
Total	(83,934)	1,445,553

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	$916,115
2020	307,441
2021	65,774
2022	72,289
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
For the Police Plan

	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	($148,499)	6/30/2018	2.30	($64,565)	($64,565)	($83,934)	$0
	514,837	6/30/2017	2.61	197,256	394,512	0	120,325
	(122,391)	6/30/2016	2.62	(28,963)	(122,391)	0	0
	846,480	6/30/2015	3.13	35,157	846,480	0	0
		Total		138,885	1,054,036	(83,934)	120,325
Assumption changes or inputs	640,969	6/30/2018	2.30	278,682	278,682	0	362,287
	447,218	6/30/2017	2.61	171,348	342,696	0	104,522
	1,103,046	6/30/2016	2.62	261,026	1,103,046	0	0
		Total		711,056	1,724,424	0	466,809
Investment gains or losses	361,453	6/30/2018	5.00	72,291	72,291	0	289,162
	(32,589)	6/30/2017	5.00	(6,518)	(13,036)	(19,553)	0
	887,160	6/30/2016	5.00	177,432	532,296	0	354,864
	1,169,726	6/30/2015	5.00	233,945	935,780	0	233,946
		Total		477,150	1,527,331		858,419
Total deferred from economic/demographic gains or losses and assumption changes or inputs						(83,934)	587,134
Total deferred from investment gains or losses						0	858,419
Total deferred from all sources						(83,934)	1,445,553
Net amount deferred							1,361,619

* 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 for the Police Plan

	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	($26,337,015)	$22,259,182	($4,077,833)	($28,963)	$889,634	$974,116	$1,834,787	($2,243,046)	
Service cost	(401,606)		(401,606)						401,606
Interest on total pension liability	(1,752,272)		(1,752,272)						1,752,272
Effect of plan changes	0		0						0
Effect of liability gains or losses	148,499		148,499	(148,499)			(148,499)		
Effect of assumption changes or inputs	(640,969)		(640,969)		640,969		640,969		
Benefit payments	1,583,933	(1,583,933)	0						
Administrative expenses		0	0						0
Member contributions		184,889	184,889						(184,889)
Expected net investment income		1,499,243	1,499,243						(1,499,243)
Investment gains or losses		(361,453)	(361,453)			361,453	361,453		
Employer contributions		670,238	670,238					670,238	
Recognition of liability gains or losses				93,528	(232,413)		(138,885)		138,885
Recognition of assumption changes or inputs					(711,056)		(711,056)		711,056
Recognition of investment gains or losses						(477,150)	(477,150)		477,150
Annual expense								(1,796,837)	1,796,837
Balances as of June 30, 2018	(27,399,430)	22,668,166	(4,731,264)	(83,934)	587,134	858,419	1,361,619	(3,369,645)	

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 (Town)

Basic Information

Plan Name: Town of Guilford Public Employees' Pension Plan.

Effective Date of Plan: October 1, 1965; restated as of January 1, 2013 and amended through July 1, 2018.

Plan year: July 1 – June 30.

Eligibility: All full-time employees are eligible if they agree to contribute. All employees hired after the effective date of the Plan join the Plan as a condition of their employment. The plan is currently frozen to new entrants.

Members of the GSA hired on or after July 1, 2011 shall not be covered by or allowed to participate with an exception for a then-current Guilford Employee promoted to a full-time GSA position on or after July 1, 2011.

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 Town's employment immediately thereafter. Elected official's service need not be continuous.

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

Contributions:

Guilford Employee Association members: 2.75% of straight-time earnings effective July 1, 2015 and 3.00% of straight-time earnings effective January 1, 2016.

Special Benefits Group: 3% of straight-time earnings.

Guilford Supervisors Association members: 3.25% of straight-time earnings effective July 1, 2012 and 3.50% of straight-time earnings effective July 1, 2013.

Guilford Professional Firefighters IAFF members: 4.00% of straight-time earnings effective July 1, 2009, 6.00% of straight-time earnings effective July 1, 2015, and 7.00% of straight-time earnings effective July 1, 2016.

Guilford Confidential Non-Supervisor: 2.50% of straight-time earnings effective July 1, 2012 and 3.00% of straight-time earnings effective July 1, 2013. For Nancy Mathewson only, her employee contribution rate changed from 4.00% to 5.00% effective July 1, 2016 and from 5.00% to 6.00% effective July 1, 2017.

Guilford Dispatchers (UPSEU) members: 3.00% of straight-time earnings effective July 1, 2001, 5.00% of straight-time earnings effective July 1, 2016, and 6.00% of straight-time earnings effective July 1, 2017.

An employee's contributions to the pension fund are returned to him with 3.5% interest, compounded annually, if he ceases to work for the Town, unless he has at least 10 years of service, in which case, he may choose to receive the regular benefits at retirement age.

Compensation Base: The employee's average, annual straight-time earnings from the employer during the period of four (4) consecutive calendar years when such earnings were the highest. For Guilford Professional Firefighters IAFF members only: the employee's average, annual straight-time earnings (including replacement time earnings) from the employer during the period of two (2) consecutive calendar years when such earnings were the highest. Annual compensation shall not exceed the limit in accordance with Internal Revenue Code (IRC) Section 401(a)(17)(B).

Benefit Formulas and Eligibilities

Normal Retirement Eligibility: Normal retirement is the later of age 65 or 5 years of participation. However, if an employee wished to continue working after his normal retirement date, he may do so. During these added years of employment, the employee will continue to contribute to the pension fund and this time will continue to add to his years of service.

Effective July 1, 2009, Guilford Professional Firefighters IAFF members are eligible for Normal Retirement at age 55 with a minimum of 25 years of service.

Normal Retirement Benefit: 2% of compensation base of employee, multiplied by the number of years (and monthly fractions) of credited service at retirement. For all Guilford Supervisors Association Members, 2.5% of compensation base, effective July 1, 2003. For all Guilford Professional Firefighters IAFF Members, 2.25% of compensation base, effective July 1, 2015. For all Guilford Dispatchers (UPSEU) members, 2.25% of compensation base, effective July 1, 2018. For Nancy Mathewson, 2.25% of compensation base, effective July 1, 2018. For the Special Benefits Group, 2.5% of compensation base.

Effective July 1, 2011, Supervisors Associations Members' benefit will be frozen once they reach 35 years of service (both service and final average earnings) except that, for those with more than 35 years of service as of July 1, 2011, the benefit is frozen at 40 years of service. No employee contribution is required once the benefit accrual is frozen.

Effective December 1, 2014, Guilford Employee Association Members' benefit will be frozen once they reach 35 years of service (both service and final average earnings) except that, for those with more than 35 years of service as of June 30, 2013, the benefit is frozen at 40 years of service. No employee contribution is required once the benefit accrual is frozen.

Disability Benefit: Employee entitled to disability benefits after 10 years of service based on formula set forth above commencing on the first day of the month following the date of disability as determined by the Pension Committee.

Effective July 1, 2009, for Guilford Professional Firefighters IAFF members suffering a Line of Duty Disability and becoming totally and permanently disabled, regardless of age and length of service, there shall be a Line of Duty Disability benefit equal to fifty percent of the Employee's base pay in effect on the date of the onset of the disability.

Disability benefit is payable to the Employee in lieu of the Retirement Benefit for the remainder of his lifetime as long as the Employee remains totally and permanently disabled.

Early Retirement Eligibility: Early retirement is the first of any month after 55^{th} birthday and 10 years of service. Effective July 1, 2011, early retirement eligibility for Supervisors Association Members is the first of any month after the earlier of (a) 55^{th} birthday and 20 years of service if the member was hired prior to July 1, 1992, and (b) 60^{th} birthday and 10 years of service.

Early Retirement Benefit: Monthly annuity equal to the normal retirement benefit based on service and earnings as of early retirement, actuarially reduced according to the following rates. The amount of pension for Firefighters who retire with less than 25 years of service will be actuarially reduced for each month by which the commencement date of the pension precedes the date he would have had 25 years of service.

Age at Early Retirement Date	Vested with Less than 25 Years of Credited Service	Vested with 25 or More Years of Credited Service
55	35.91%	61.78%*
56	39.38	67.76*
57	43.28	74.46*
58	47.64	81.98*
59	52.56	90.44*
60	58.12	100.00
61	64.42	100.00
62	71.59	100.00
63	79.78	100.00
64	89.17	100.00
65	100.00	100.00

*100% for Guilford Professional Firefighters IAFF members retiring on or after July 1, 2009.

Termination of Employment: An employee whose employment terminates after completion of 5 years of 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 or a lump-sum payment equal to the actuarial value of the benefit payable.

Effective July 1, 2009, for Guilford Professional Firefighters IAFF members suffering a line of duty death on or after March 9, 2009, there shall be a Line of Duty Death benefit (LODD) equal to 50% of final average straight time earnings payable to the spouse for life, plus 10% for each dependent child, with a maximum of 75%.

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.

Cost-of-Living Increase: Retired employees have received cost-of-living increases in their benefits several times since 1991. The latest increase provided 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 2011.

Form of Payment: Single Life Annuity, Joint and Survivor Annuity. Two Special Benefits Group members are permitted to receive their benefits in the form of a Lump Sum.

Maximum Benefits: Annual benefits may not exceed the limits in accordance with Internal Revenue Code Section 415.

Financing Medium: Trust Fund

Administration: Plan is administered by the 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 valuations.

Appendix B

Summary of Principal Plan Provisions (Police)

Basic Information

Plan Name: Town of Guilford Police Retirement Fund.

Effective Date of Plan: October 2, 1983; amended through July 1, 1990 and as further amended July 1, 2018.

Plan year: July 1 – June 30.

Eligibility: All regular full-time sworn employees of the Guilford Police Department; the Chief of Police, and Assistant Chief of Police shall be eligible to participate in this fund. No new hires will be eligible to participate in the plan effective January 1, 2014.

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 are counted. Absence for military service receives automatic approval if the employee returns to the Town's employ immediately thereafter and shall be included in calculating the number of years of service.

Each regular member of the police department of the Town of Guilford, upon the effective date, shall become a participating member of the Police Retirement Fund. The years of service under the Town Pension Plan of those who are or become regular members of the police department shall count for retirement under the Police Retirement Fund. No credit shall be granted to a regular member of the police department for any such prior years of service under the Town Pension Plan for which the regular member of the police department has acquired a vested pension right under the Town Pension Plan for service to the Town while not working as a regular member of the police department.

If an employee returns to active employment within twelve months of his termination of employment, prior credited service shall be preserved only if he repays the amount of his contributions with interest at the normal passbook rate, as per the Guilford Savings Bank within two years of his date of re-employment.

A participant shall be allowed to purchase Credited Service for Active Military Service completed prior to employment with the Employer. A participant hired before July 1, 2009 may purchase Credited Service for all completed Military Service. A participant hired on or after July 1, 2009 may purchase a maximum of three years of Credited Service for prior Military Service. Military Service included in the credited service can not exceed the length of service under the Town's Police Department.

Contributions: Employee contributions: 6% of straight-time compensation per annum. Effective July 1, 2014, the employee contribution rate became 7% of regular straight time salaries plus up to 12 hours of overtime per week. Effective July 1, 2017, Employees shall contribute eight percent (8%) of their straight time wages and up to twelve (12) hours of police overtime.

Town contribution: All other contributions required to finance the benefits of the plan are paid for the Town.

Compensation Base: Average of annual straight-time earnings (including overtime) during the period of twenty-four consecutive calendar months when such earnings were the highest. The maximum overtime earning to be considered as Compensation Base is limited up to twelve hours per week.

Benefit Formulas and Eligibilities

Normal Retirement Eligibility: Normal Retirement Date will be the first day of the month following the earlier of the date on which the Employee:

a) Attains his sixty-fifth (65^{th}) birthday,

b) Completes twenty (20) years of Credited Service without regard to age.

If an Employee has completed twenty (20) years of Credited Service as of his termination of employment, or if he would have completed twenty (20) years of Credited Service prior to attaining age sixty-five (65) had he remained in employment beyond his termination of employment, then he will be entitled to a pension commencing on what would have been his Normal Retirement Date as defined above. The amount of such pension shall be computed as for a normal retirement benefit based upon the Employee's Compensation Base and Credited Service as of his actual termination of employment, and shall be computed without actuarial reduction.

Normal Retirement Benefit: Effective July 1, 2014, a sum equal to 2.25% per year of credited service multiplied by the compensation base.

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. The amount of normal benefits is reduced actuarially for each month of payment before normal retirement.

Disability Benefit: Employees who become totally and permanently disabled are entitled to disability benefits based on formula set forth above. Members of police department entitled to annual pension of 50% of compensation base, with payments to begin immediately, if disability is in line of duty.

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 active full-time married employee should die in service, his dependent spouse shall receive a pension for life in the amount of 100% of 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.

Cost-of-Living Increase: Retired employees have received cost-of-living increases in their benefits several times since 1991. The latest increase provided 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 2014.

Form of Payment: Single Life Annuity, Joint and Survivor Annuity.

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 C

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.

Economic Assumptions

Net Investment Yield:

For Disclosure: An average investment yield of 6.5% 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 annually. 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:

> **Disclosure:** Salary scales were modified as below based on 2018 Salary Increase Experience Study.

Plan	Cost Center	Rate of Salary Increase
Town	Confidential Supervisors (CSU)	FY 18/19 3.00% and 3.25% afterwards
Town	Firefighters (IAFF)	FY 18/19 2.65%, FY 19/20 2.65%, and 3.00% afterwards
Town	Guilford Employees Association (GEA)	FY 18/19 2.75%, FY 19/20 2.50%, and 2.75% afterwards
Town	Confidential Non-Supervisors (CNSU)	3.00%
Town	Guilford Supervisors Association (GSA)	2.75%
Town	Dispatchers (UPSEU)	FY 18/19 2.50% and 2.75% afterwards
Police	Police	FY 18/19 2.65%, FY 19/20 2.65%, and 2.75% afterwards

Expense: Constant rate for all ages as shown below:

Plan	Cost Center	Rate of Salary Increase
Town	Confidential Supervisors (CSU)	3.25%
Town	Firefighters (IAFF)	3.25%
Town	Guilford Employees Association (GEA)	2.75%
Town	Confidential Non-Supervisors (CNSU)	2.75%
Town	Guilford Supervisors Association (GSA)	2.75%
Town	Dispatchers (as of 7/1/15, represented by UPSEU; formerly represented by NAGE)	2.75%
Police	Police	2.75%

Rationale: This assumption was selected based upon the results of our analyses of plan experience as described in our report 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 (Line of Duty) for Police Employees: Average rates of disability were assumed in the valuation for police employees. Representative disability rates per 1,000 employees are presented below:

Age	Rate
25	0.50
35	3.50
45	15.00
55	48.00

Rationale: This assumption was selected based upon the results of our analyses of plan experience from 1997 to 2015 and was approved by the Committee.

Disability (Line of Duty) for Guilford Professional Firefighters IAFF members: Average rates of disability were assumed in the valuation for Guilford Professional Firefighters IAFF members. Representative disability rates per 1,000 employees are presented below:

Age	Rate
25	0.10
35	0.70
45	3.00
55	9.60

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.

Severance: Average rates of turnover were anticipated in the valuation. 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 town (non-union) employees, Supervisor Association Members, Employees Association Members and ambulance/dispatchers, retirement was assumed to occur at the earlier of (a) attainment of age 65 and the fifth anniversary of plan participation and (b) attainment of age 60 and completion of 25 years of service.

For IAFF members, retirement was assumed to occur at the earlier of (a) attainment of age 65 and the fifth anniversary of plan participation and (b) attainment of age 55 and completion of 25 years of service.

For Police employees, retirement was assumed to occur at the earlier of (a) attainment of age 65 and (b) attainment of age 55 and completion of 25 years of service. For Police employees who have or will have 20 or more years of service prior to age 55, the following retirement rates were used:

Service	Rate
20	40.00%
21-24	20.00%
25	50.00%
26-34	20.00%
35	100.00%

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

> **Rationale:** These assumptions were selected based upon actual retirement experience and 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.

Liability Load: Liabilities and covered payrolls of members receiving IAFF benefits and Police Plan members were loaded 20%.

> **Rationale:** Benefits for Police and IAFF members are determined based on compensation that includes some portion of overtime pay earned during the final average pay period. Since our valuation is run on base pay, we load the liabilities for the IAFF Cost Center in the Town Plan (and for the one Confidential Supervisor who receives IAFF benefits) and for the Police Plan to account for the higher pay that is actually used in calculating plan benefits. The liability load is determined based on an analysis of historical overtime pay information received.

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%.
3) Salary scales were modified based on 2018 Salary Increase Experience Study.