

GASB Statements No. 67 and 68
Report for Fiscal Year 2020

Northampton Retirement System

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October 22, 2020

Northampton Board of Retirement
Memorial Hall, First Floor
240 Main Street
Northampton, MA 01060

To the Northampton Retirement Board:

For the purpose of satisfying the requirements of the Government Accounting Standards Board (GASB) Statements No. 67 and 68, Stone Consulting, Inc. has prepared a set of illustrative tables and other Required Supplementary Information (RSI) based on the January 1, 2018 actuarial valuation of the Northampton Retirement System performed by Stone Consulting, Inc.

The valuation and this report were prepared using generally accepted actuarial principles and practices and meet the parameters set by the Governmental Accounting Standards Board (GASB).

To the best of our knowledge, this report is complete and accurate, and the assumptions used represent our best estimate of anticipated experience of the system. Stone Consulting, Inc. is completely independent of the City of Northampton and the Northampton Retirement System. This includes any of its officers and key personnel. Neither we or anyone else closely associated with us has any relationship with the City of Northampton or the Northampton Retirement System that would impair our independence, other than this or related assignments.

We are pleased to present these exhibits. If the Board has any questions on the content of this report, we would be glad to respond. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in a misleading or inaccurate understanding of the results.

The undersigned is a consultant for Stone Consulting, Inc. and a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
STONE CONSULTING, INC.
Actuaries for the Plan



Lawrence B. Stone
Member, American Academy of Actuaries

Summary of Results

This report has been prepared for the purpose of satisfying the requirements of GASB Statements No. 67 and 68. For GASB 67 the results are as of a valuation date of January 1, 2018 and a reporting date of December 31, 2019. For GASB 68 the results are as of a valuation date of January 1, 2018, a measurement date of December 31, 2019 and a reporting date of June 30, 2020.

The methods, assumptions, and plan provisions used to prepare these exhibits are consistent with those used in the funding valuation, and are outlined in the January 1, 2018 funding valuation report unless otherwise stated in this report.

Highlights of the results for the Northampton Retirement System as of December 31, 2019 are as follows:

Total Pension Liability (TPL)	\$ 192,129,271
Plan Fiduciary Net Position (FNP)	<u>141,396,599</u>
System's Net Pension Liability (NPL)	\$ 50,732,673
Plan FNP as a percentage of the TPL	73.6%
Covered-employee payroll	\$ 30,028,353
Plan NPL as a percentage of Covered-employee payroll	168.9%
Pension Expense	\$ 7,770,078

NOTE: Totals in this report may not sum due to rounding

The TPL, FNP, and NPL are all developed and discussed on the following two pages, followed by the pension expense and deferrals.

Distribution of the Member Population

As of January 1, 2018, the following employees were covered by the benefits terms:

Inactive employees or beneficiaries currently receiving benefits	431
Inactive employees entitled to a return of contributions	216
Active employees	<u>619</u>
TOTAL	1,266

Changes to the Net Pension Liability

	Total Pension Liability (a)	Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances at beginning of Measurement Period (01/01/2019)	\$ 185,452,672	\$ 129,005,993	\$ 56,446,679
<u>Changes for the Year:</u>			
Service Cost	4,106,264		4,106,264
Interest	13,574,204		13,574,204
Change in benefit terms	0		0
Differences between expected and actual experience	0		0
Change in assumptions	0		0
Contributions - employer		6,676,687	(6,676,687)
Contributions - employee		2,999,380	(2,999,380)
Net investment income		13,952,838	(13,952,838)
Benefit payments, including refunds of employee contributions	(11,003,868)	(11,003,868)	0
Administrative expense		(234,431)	234,431
Other changes		0	0
Net Changes	<u>6,676,600</u>	<u>12,390,606</u>	<u>(5,714,006)</u>
Balances at end of Measurement Period (12/31/2019)	\$ 192,129,271	\$ 141,396,599	\$ 50,732,673

*Update procedures were used to roll the Total Pension Liability forward from the valuation date (01/01/2018) to the measurement date (12/31/2019). [GASB 68, Paragraph 80 c.]

CHANGES IN METHODS, ASSUMPTIONS, AND PLAN PROVISIONS

The results of the most recent valuation (January 1, 2018) have already been reflected in the GASB Statements 67 and 68 report for Fiscal Year 2019. As there are no new valuation results to reflect, no gains or losses occurred from experience or changes of assumptions.

Projection of the Net Pension Liability

TOTAL PENSION LIABILITY (TPL)

The Total Pension Liability at the beginning of the measurement period (01/01/2019) is equal to the TPL from the end of the previous measurement period. The TPL is rolled forward through each measurement period by:

- Adding the Service Cost,
- Subtracting benefits paid,
- Applying interest (as calculated on page 6), and
- Recognizing any changes from new valuation results.

The Actuarial Accrued Liability (AAL), calculated as of the valuation date, is compared to the projected TPL. The difference between the two figures is measured as of the measurement date, and allocated to the following categories:

- Changes in assumptions
- Changes of plan provisions
- The remainder of the difference is allocated to "Differences between actual and expected experience"

All of these changes are recognized immediately in the TPL. Their treatment in the pension expense is discussed on the following page. Note that the TPL shown includes a 1/1/2018 liability of \$948,471 for net 3(8)(c) payments, calculated by assuming that every dollar of 3(8)(c) net benefit generates the same amount of liability as a dollar of the total retirement benefit, and rolled forward with the rest of the TPL. This method differs from the funding valuation, where net 3(8)(c) payments are funded on a pay-as-you-go basis and no explicit liability is calculated.

PLAN FIDUCIARY NET POSITION (FNP) AND NET PENSION LIABILITY (NPL)

GASB Statement No. 68, Paragraph 59 requires that the fair value of assets be used for the Fiduciary Net Position. For the fair value of assets we used the market value of assets adjusted by payables and receivables.

The Net Pension Liability (NPL) is the portion of the TPL not covered by the FNP. This amount is presented as a percentage of covered payroll. The NPL ratio for the Northampton Retirement System is 168.9% of covered pay. In this report, covered pay is reported as described in GASB Statement No. 82 – pensionable payroll for the measurement period.

PENSION EXPENSE AND NET DEFERRALS

For the Pension Expense, gain and losses are recognized over a period of multiple years, with a portion being recognized immediately and the remainder being added to deferred inflows and outflows:

- Asset gains and losses are recognized over a five-year period [GASB 68, Paragraph 71b]
- Experience and Assumption changes are recognized over the average remaining service of the current members [GASB 68, Paragraph 71a]
- Plan provision changes are recognized immediately

Some inflows/outflows which originated in prior measurement periods will continue to be recognized this period. The total amount to be recognized this period is part of the pension expense; the remainder is included in the deferrals. Both are shown on the following page, and are calculated in greater detail on pages 9-10.

RESULTS BY EMPLOYER

Exhibits are provided beginning on page 14 which provide individual results for the various employers that make up the Northampton Retirement System. Pension expense, as well as any deferred inflows and outflows of resources, and any excess contribution generated by Federal Grants, have been allocated to the various employers in the same manner as the FY2020 appropriation.

Per GASB 68, the change in proportionality from FY2019 to FY2020 if the individual employers' NPL and deferred inflows and outflows need to be allocated to the individual employers. This is calculated on page 16. These amounts are then recognized over the average remaining service, which is 5.4 years. The recognition of proportion changes is developed on page 17.

Pension Expense for the Fiscal Year Ended June 30, 2020

NOTE*	Description	Fiscal 2020
A	Service Cost	\$ 4,106,264
A, B	Interest on the Total Pension Liability	13,574,204
C	Differences between Expected and Actual Experience	55,985
D	Changes of Assumptions	1,405,841
D	Changes to Benefit Provisions	0
A	Employee Contributions	(2,999,380)
E	Projected Earnings on Pension Plan Investments	(9,456,585)
F	Differences between Projected and Actual Earnings on Plan Investments	849,319
A	Pension Plan Administrative Expense	234,431
A	Other Changes in Fiduciary Net Position	<u>0</u>
	Total Pension Expense	\$ 7,770,078

* Notes shown on following page.

Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions

	Deferred Outflows Of Resources	Deferred Inflows Of Resources
Differences between expected and actual experience	\$ 1,486,262	\$ (800,417)
Changes of assumptions	4,169,698	0
Net difference between projected and actual earnings on pension plan investments	<u>0</u>	<u>(4,981,741)</u>
TOTAL	\$ 5,655,960	\$ (5,782,159)

Year Ending December 31, *	Recognition
2020	\$ 419,532
2021	\$ (1,445,874)
2022	\$ 1,249,945
2023	\$ (349,802)
2024	\$ 0
Thereafter	\$ 0

*The years are based on measurement date. For GASB 68, the year ending December 31, 2020 is Fiscal 2021.

NOTES

- A. See the RSI schedule of changes to the net pension liability, on page 1.
- B. Events that impact the total pension liability are assumed to happen evenly throughout the period. In addition, the amount of interest on the total pension liability is calculated using an interest rate equal to the discount rate that was used to determine the service cost. The amount is determined as follows:

Description	Amount for Period (a)	Portion of Period (b)	Interest Rate (c)	Interest on the TPL (a) x (b) x (c)
Beginning TPL	\$ 185,452,672	100%	7.375%	\$ 13,677,135
Service cost	4,106,264	100%	7.375%	302,837
Benefit payments	(11,003,868)	50%	7.375%	(405,768)
Total interest on the NPL				\$ 13,574,204

- C. Differences between expected and actual experience recognized in the current period in accordance with paragraph 71a of Statement 68. For the detailed calculation of the recognition of this amount, see the schedules on page 9.
- D. Assumption and plan provision changes recognized in pension expense in the current period in accordance with paragraph 71a of Statement 68. For detailed calculation of the recognition of these amounts, see the schedule on page 9.
- E. Changes in the amounts invested are assumed to occur evenly throughout the period. In addition, the amount of projected earnings on pension plan investments is calculated using the assumed rate of return on pension plan investments as of the beginning of the period. The amount is determined as follows:

Description	Amount for Period (a)	Portion of Period (b)	Projected Rate of Return (c)	Projected Earnings (a) x (b) x (c)
Beginning FNP	\$ 129,005,993	100%	7.375%	\$ 9,514,192
Employer contributions	6,676,687	50%	7.375%	246,203
Employee contributions	2,999,380	50%	7.375%	110,602
Benefit payments	(11,003,868)	50%	7.375%	(405,768)
Administrative expense and other	(234,431)	50%	7.375%	(8,645)
Total projected earnings				\$ 9,456,585
Actual investment earnings				<u>13,952,838</u>
Difference: (Gain)/Loss				\$ (4,496,253)

- F. Differences between projected and actual earnings recognized in the current period in accordance with paragraph 71b of Statement 68. For detailed calculation of the recognition of this amount, see the schedule on page 9.

Discount Sensitivity

The following presents the Northampton Retirement System's Net Pension Liability calculated at the valuation discount rate of 7.375%, as well as at discount rates one percent lower (6.375%) and one percent higher (8.375%).

Fiscal Year	1% Decrease (6.375%)	Current Discount Rate (7.375%)	1% Increase (8.375%)
2020	\$ 72,330,155	\$ 50,732,673	\$ 32,565,037

Long-Term Expected Real Rate of Return

The long-term expected real rate of return reflects the expected rate of return on plan assets minus the expected rate of inflation. Note that the discount rate includes the effect of inflation. The long-term real rate of return removes the effect of inflation on the return amounts. It is a long-term assumption and is meant to reflect a best estimate of future experience, based on the expected asset allocation.

Allocation percentages are based on information provided by the Northampton Retirement System, and their asset consultant, De Burlo. The real rates of return below are based on 30-year return estimates provided by NEPC through the Pension Reserve Investment Trust, adjusted using NEPC's 2.50% inflation assumption.

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric Average)
Large Cap Equities	41%	4.29%*
Small/Mid Cap Equities	15%	4.29%*
International Equities	5%	4.39%
Emerging Market Equities	3%	6.54%
Fixed Income	35%	0.88%
Private Equity	1%	8.20%

* NEPC's allocation does not provide separate rates by capitalization; the rate shown is for "US Equity".

Development of Results

DISCOUNT RATE

Projections were made using a discount rate assumption of 7.375%, which is consistent with the actuarial funding valuation. One of the objectives of the provisions of GASB 68 is to examine how benefit payments and plan contributions and investment earnings interact on a cash flow basis. GASB requires that these amounts be calculated with Market Value of Assets and using the Entry Age Normal cost method.

Projected contributions for each year are the sum of:

- Projected normal cost,
- Amortization of the unfunded liability,
- Administrative expense, and
- Other benefit costs such as 3(8)(c) payments.

The amortization bases and periods are consistent with those seen in the valuation report. Administrative expenses are increased by 4.50% per year. The Northampton Retirement System's Fiduciary Net Position was projected to be available to make all future benefit payments of current active and inactive employees. Thus, the long-term expected rate of return on investments was applied for all benefit periods when calculating the Net Pension Liability.

The long-term rate of return which was used to develop the discount rate of 7.375% includes the effect of a 3.00% long-term rate of inflation (not subtracted out as in the real rates of return). It is based on a combination of expected rates of return on the mix of current and expected investments over a long-term period. These expectations are based on current market conditions, historical experience and future expectations. It assumes a rebalancing of assets on an ongoing basis as well as a constant monitoring of asset allocation and manager performance.

EXHIBITS

The recognition and deferral of various gains and losses are developed on the following two pages. These are followed by historical exhibits displaying changes in the NPL and contribution amounts for past years, the money-weighted rate of return, and finally the exhibits which display results by employer.

Increase / (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Expected and Actual Experience

Year	Differences between actual and expected experience	Recognition period (years)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2017	\$ (2,325,021)	6.1	\$ -	\$ -	\$ -	\$ (381,151)	\$ (381,151)	\$ (381,151)	\$ (381,151)	\$ (381,151)	\$ (38,115)	\$ -	\$ -
2018	\$ -	6.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2019	\$ 2,360,534	5.4	\$ -	\$ -	\$ -	\$ -	\$ 437,136	\$ 437,136	\$ 437,136	\$ 437,136	\$ 437,136	\$ 174,854	\$ -
2020	\$ -	5.4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net increase (decrease) in pension expense			\$ -	\$ -	\$ -	\$ (381,151)	\$ 55,985	\$ 55,985	\$ 55,985	\$ 55,985	\$ 399,021	\$ 174,854	\$ -

Increase / (Decrease) in Pension Expense Arising from the Recognition of the Effects of Changes of Assumptions

Year	Change of assumptions	Recognition period (years)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2017	\$ 2,863,060	6.1	\$ -	\$ -	\$ 469,354	\$ 469,354	\$ 469,354	\$ 469,354	\$ 469,354	\$ 469,354	\$ 46,935	\$ -	\$ -
2018	\$ -	6.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2019	\$ 5,057,027	5.4	\$ -	\$ -	\$ -	\$ -	\$ 936,486	\$ 936,486	\$ 936,486	\$ 936,486	\$ 936,486	\$ 374,595	\$ -
2020	\$ -	5.4	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net increase (decrease) in pension expense			\$ -	\$ -	\$ 469,354	\$ 469,354	\$ 1,405,841	\$ 1,405,841	\$ 1,405,841	\$ 1,405,841	\$ 983,422	\$ 374,595	\$ -

Increase / (Decrease) in Pension Expense Arising from the Recognition of Differences between Expected and Actual Earnings on Pension Plan Investments

Year	Differences between projected and actual earnings on pension plan investments	Recognition period (years)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
2015	\$ (5,181,134)	5	\$ (1,036,227)	\$ (1,036,227)	\$ (1,036,227)	\$ (1,036,227)	\$ (1,036,227)	\$ -	\$ -	\$ -	\$ -	\$ -
2016	\$ 9,458,065	5	\$ -	\$ 1,891,613	\$ 1,891,613	\$ 1,891,613	\$ 1,891,613	\$ 1,891,613	\$ -	\$ -	\$ -	\$ -
2017	\$ 9,327,029	5	\$ -	\$ -	\$ 1,865,406	\$ 1,865,406	\$ 1,865,406	\$ 1,865,406	\$ 1,865,406	\$ -	\$ -	\$ -
2018	\$ (13,876,007)	5	\$ -	\$ -	\$ -	\$ (2,775,201)	\$ (2,775,201)	\$ (2,775,201)	\$ (2,775,201)	\$ (2,775,201)	\$ -	\$ -
2019	\$ 3,833,763	5	\$ -	\$ -	\$ -	\$ -	\$ 766,753	\$ 766,753	\$ 766,753	\$ 766,753	\$ 766,753	\$ -
2020	\$ (4,496,253)	5	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (899,251)	\$ (899,251)	\$ (899,251)	\$ (899,251)	\$ (899,251)
Net increase (decrease) in pension expense			\$ (1,036,227)	\$ 855,386	\$ 2,720,792	\$ (54,409)	\$ 712,343	\$ 849,319	\$ (1,042,294)	\$ (2,907,699)	\$ (132,498)	\$ (899,251)

Deferred Outflows and Deferred Inflows of Resources Arising from Differences between Expected and Actual Experience

Year	Experience Losses (a)	Experience Gains (b)	Amounts Recognized in Pension Expense through June 30, 2020 (c)	BALANCES AT JUNE 30, 2020	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2017	\$ -	\$ (2,325,021)	\$ (1,524,604)	\$ -	\$ (800,417)
2018	\$ -	\$ -	\$ -	\$ -	\$ -
2019	\$ 2,360,534	\$ -	\$ 874,272	\$ 1,486,262	\$ -
2020	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL				\$ 1,486,262	\$ (800,417)

Deferred Outflows and Deferred Inflows of Resources Arising from Changes of Assumptions

Year	Increases in the Total Pension Liability (a)	Decreases in the Total Pension Liability (b)	Amounts Recognized in Pension Expense through June 30, 2020 (c)	BALANCES AT JUNE 30, 2020	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2017	\$ 2,863,060	\$ -	\$ 1,877,416	\$ 985,644	\$ -
2018	\$ -	\$ -	\$ -	\$ -	\$ -
2019	\$ 5,057,027	\$ -	\$ 1,872,973	\$ 3,184,054	\$ -
2020	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL				\$ 4,169,698	\$ -

Deferred Outflows and Deferred Inflows of Resources
Arising from Differences between Expected and Actual Earnings on Pension Plan Investments

Year	Investment Earnings Less than Projected (a)	Investment Earnings More than Projected (b)	Amounts Recognized in Pension Expense through June 30, 2020 (c)	BALANCES AT JUNE 30, 2020	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2016	\$ 9,458,065	\$ -	\$ 9,458,065	\$ -	\$ -
2017	\$ 9,327,029	\$ -	\$ 7,461,623	\$ 1,865,406	\$ -
2018	\$ -	\$ (13,876,007)	\$ (8,325,604)	\$ -	\$ (5,550,403)
2019	\$ 3,833,763	\$ -	\$ 1,533,505	\$ 2,300,258	\$ -
2020	\$ -	\$ (4,496,253)	\$ (899,251)	\$ -	\$ (3,597,002)
TOTAL				\$ 4,165,664	\$ (9,147,405)
			NET TOTAL		\$ (4,981,741)

**Schedule of Changes in Northampton's
Net Pension Liability and Related Ratios**

(Amounts in Thousands)

Fiscal Year *	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
TOTAL PENSION LIABILITY										
Service cost	4,106	3,929	3,733	3,572	3,349	3,205				
Interest	13,574	12,611	12,415	11,980	11,930	11,483				
Change of benefit terms	-	-	-	-	-	-				
Differences between expected and actual experience	-	2,361	-	(2,325)	-	-				
Change of assumptions	-	5,057	-	2,863	-	-				
Benefit payments, including refunds of employee contributions	(11,004)	(11,132)	(10,628)	(10,281)	(9,129)	(9,009)				
Net change in Total Pension Liability	6,677	12,825	5,519	5,809	6,150	5,679				
Total Pension Liability - beginning	185,453	172,627	167,109	161,300	155,150	149,471				
Total Pension Liability - ending	192,129	185,453	172,627	167,109	161,300	155,150				
PLAN FIDUCIARY NET POSITION										
Contributions - employer	6,677	6,168	5,946	5,645	5,432	5,035				
Contributions - employee	2,999	2,757	2,698	2,509	2,503	2,730				
Net Investment Income	13,953	5,374	21,781	(1,165)	(816)	12,930				
Benefit payments , including refunds of employee contributions	(11,004)	(11,132)	(10,628)	(10,281)	(9,129)	(9,009)				
Administrative expense	(234)	(244)	(212)	(207)	(194)	(196)				
Other	-	-	-	-	-	-				
Net change in plan Fiduciary Net Position	12,391	2,924	19,585	(3,499)	(2,204)	11,490				
Plan Fiduciary Net Position - beginning	129,006	126,082	106,497	109,997	112,201	100,710				
Plan Fiduciary Net Position - end	141,397	129,006	126,082	106,497	109,997	112,201				
Northampton Net Pension Liability - ending	50,733	56,447	46,545	60,611	51,303	42,949				
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	73.6%	69.6%	73.0%	63.7%	68.2%	72.3%				
Covered-employee payroll (calendar year timing)	30,028	28,853	27,879	27,067	26,016	24,220				
Northampton's Net Pension Liability as a percentage of covered-employee payroll	168.9%	195.6%	167.0%	223.9%	197.2%	177.3%				

Note: sums may not total due to rounding

Information not available prior to 2015

Schedule of Plan Contributions

(Amounts in Thousands)

Fiscal Year	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Actuarially determined contribution	\$ 6,657	\$ 6,159	\$ 5,930	\$ 5,629	\$ 5,415	\$ 5,017				
Contributions in relation to the actuarially determined contribution	<u>(6,677)</u>	<u>(6,168)</u>	<u>(5,946)</u>	<u>(5,645)</u>	<u>(5,432)</u>	<u>(5,035)</u>				
Contribution deficiency / (excess)*	(20)	(9)	(16)	(16)	(16)	(18)				
Covered-employee payroll (fiscal year timing)	\$ 30,629	\$ 29,296	\$ 28,286	\$ 27,473	\$ 26,645	\$ 25,371				
Contributions as a percentage of covered-employee payroll	21.8%	21.1%	21.0%	20.5%	20.4%	19.8%				

* Excess is due to Federal Grants

Information not available for years prior to 2015

GASB Statement No. 67, Paragraph 30 b. (4)
Money-Weighted Rate of Return, 2019

		New External Cash Flows					
		Beginning of month	Middle of Month	End of Month	Periods Invested**	Investment Return	Cash Flow with Return
Starting Value* (12/31/2018)	\$	129,030,951.19			12	\$ 13,930,582.68	\$ 142,961,533.87
Cash Flows:							
January		18,723.75	283,421.09	(993,529.83)	11	(66,617.95)	(758,002.94)
February		68,920.70	204,645.73	(1,196,375.43)	10	(80,708.81)	(1,003,517.81)
March		71,363.05	349,397.71	(922,890.27)	9	(37,856.63)	(539,986.14)
April		500.93	237,950.84	(907,235.36)	8	(46,213.62)	(714,997.21)
May		162.90	369,500.68	(914,842.08)	7	(31,918.45)	(577,096.95)
June		512,933.06	256,595.61	(1,017,256.46)	6	(7,241.24)	(254,969.03)
July		6,305,344.88	210,423.67	(955,818.65)	5	300,058.62	5,860,008.52
August		0.00	222,240.83	(1,094,907.47)	4	(29,353.86)	(902,020.50)
September		0.00	352,537.62	(978,079.86)	3	(14,692.03)	(640,234.27)
October		1,248.72	330,327.25	(950,945.78)	2	(9,224.86)	(628,594.67)
November		0.00	255,183.30	(955,159.38)	1	(4,904.14)	(704,880.22)
December		25,969.86	275,875.95	(1,005,984.06)	0	<u>1,403.84</u>	<u>(702,734.41)</u>
Ending Value* (12/31/2019)		\$141,394,508.24			Sum:	\$ 13,903,313.55	\$ 141,394,508.24

* Value shown does not include any payables or receivables, except those related to investments.

** Middle of period cash flows are given an additional half period of interest, and beginning of period cash flows are given an additional full period.

Return Rate:	10.80%
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Results by Employer

Employer	Covered Payroll*	Proportionate Share of NPL**	Proportionate share of NPL as a percentage of covered payroll*	Proportionate share of NPL Discount Sensitivity	
				1% Increase (8.375%)	1% Decrease (6.375%)
City of Northampton	\$ 28,571,527	\$ 48,020,518	168.1%	\$ 30,828,484	\$ 68,458,215
Northampton Housing Authority	\$ 1,456,827	\$ 2,712,154	186.2%	\$ 1,736,552	\$ 3,871,939
TOTAL	\$ 30,028,353	\$ 50,732,673	168.9%	\$ 32,565,037	\$ 72,330,155

Employer	Actuarially determined contribution FY2020	Contributions made for FY 2020	Contribution deficiency (excess)	Contributions as a percentage of covered payroll***
City of Northampton	\$ 6,301,238	\$ (6,319,807)	\$ (18,569)	22.1%
Northampton Housing Authority	\$ 355,826	\$ (356,880)	\$ (1,054)	24.5%
TOTAL	\$ 6,657,064	\$ (6,676,687)	\$ (19,622)	22.2%

Employer	Proportion	Proportionate Share of Pension Expense	Proportion changes and differences between employer contributions and proportionate share recognized as expense	Total Pension Expense
City of Northampton	94.63%	\$ 7,354,692	\$ (35,963)	\$ 7,318,729
Northampton Housing Authority	5.37%	\$ 415,386	\$ 35,963	\$ 451,349
TOTAL	100.00%	\$ 7,770,078		

* Covered Payroll is the projected amount for the 2019 calendar year based on employee data as of December 31, 2017

** ERI liability used in proportionate share of NPL is: \$2,199,891 for City and \$111,956 for Housing

*** Here the Covered Payroll figure is projected for Fiscal Year 2020, based on employee data as of December 31, 2017

Deferred Outflows of Resources by Employer*

Employer	Differences between expected and actual experience	Changes of assumptions	Net difference between projected and actual earnings on pension plan investments	Changes in proportion and differences between employer contributions and proportionate share of contributions	Employer contributions subsequent to the measurement date	Total Deferred Outflows of Resources
City of Northampton	\$ 1,406,807	\$ 3,946,787	\$ -	\$ 67,645	\$ -	\$ 5,421,238
Northampton Housing Authority	\$ 79,455	\$ 222,911	\$ -	\$ 249,737	\$ -	\$ 552,103
TOTAL	\$ 1,486,262	\$ 4,169,698	\$ -	\$ 317,382	\$ -	\$ 5,973,342

Deferred Inflows of Resources by Employer*

Employer	Differences between expected and actual experience	Changes of assumptions	Net difference between projected and actual earnings on pension plan investments	Changes in proportion and differences between employer contributions and proportionate share of contributions	Employer contributions subsequent to the measurement date	Total Deferred Inflows of Resources
City of Northampton	\$ 757,627	\$ -	\$ 4,715,419	\$ 249,737	N/A	\$ 5,722,783
Northampton Housing Authority	\$ 42,790	\$ -	\$ 266,322	\$ 67,645	N/A	\$ 376,757
TOTAL	\$ 800,417	\$ -	\$ 4,981,741	\$ 317,382	N/A	\$ 6,099,541

Recognition of Deferred Outflows and Deferred Inflows

Employer	AMOUNT TO BE RECOGNIZED FOR THE YEAR ENDING DECEMBER 31,					
	2020	2021	2022	2023	2024	Thereafter
City of Northampton	\$ 361,141	\$ (1,435,540)	\$ 1,122,511	\$ (352,169)	\$ 2,512	\$ -
Northampton Housing Authority	\$ 58,391	\$ (10,334)	\$ 127,434	\$ 2,367	\$ (2,512)	\$ -
TOTAL	\$ 419,532	\$ (1,445,874)	\$ 1,249,945	\$ (349,802)	\$ 0	\$ -

* Deferred Outflows and Inflows due to experience, assumption changes, and investment earnings are all allocated according to the employer's share of the NPL

Effects of Changes in Proportion on Employers' Proportionate Share of NPL, and Deferred Inflows and Deferred Outflows of Resources

Employer	Proportion Change			FY2020 Contribution		
	Prior Proportionate Share of Prior NPL net of Deferrals	Share of Prior NPL based on Current Proportion of NPL	Difference (A)	Proportionate Share of Contribution based on Share of NPL	Amount Paid	Difference (B)
City of Northampton	\$ 47,071,174	\$ 47,105,031	\$ 33,857	\$ 6,319,753	\$ 6,319,807	\$ 54
Northampton Housing Authority	\$ 2,694,306	\$ 2,660,448	\$ (33,857)	\$ 356,934	\$ 356,880	\$ (54)
TOTAL	\$ 49,765,480	\$ 49,765,480	\$ -	\$ 6,676,687	\$ 6,676,687	\$ -

Employer	Total Proportion Change (A) + (B)	Recognized as Pension Expense*	Deferred for later recognition
City of Northampton	\$ 33,911	\$ 6,280	\$ 27,631
Northampton Housing Authority	\$ (33,911)	\$ (6,280)	\$ (27,631)
TOTAL	\$ -	\$ -	\$ -

* Based on an average remaining service life of 5.4 years.

Recognition of Proportion Changes

Proportion Changes by Employer / Year

Employer	2020	2019	2018	2017	2016	2015	2014
City of Northampton	\$ 33,911.33	\$ (373,110.90)	\$ 17,737.47	\$ (43,036.18)	\$ 185,995.80	N/A	N/A
Northampton Housing Authority	\$ (33,911.33)	\$ 373,110.90	\$ (17,737.47)	\$ 43,036.18	\$ (185,995.80)	N/A	N/A

Average Remaining Service Life by Year

2020	5.4
2019	5.4
2018	6.1
2017	6.1
2016	6

Recognition Percentages by Year

Year of Gain/Loss	Percentage Recognized by Year*						
	2020	2021	2022	2023	2024	2025	Thereafter
2020	18.5%	18.5%	18.5%	18.5%	18.5%	7.4%	0.0%
2019	18.5%	18.5%	18.5%	18.5%	7.4%	0.0%	0.0%
2018	16.4%	16.4%	16.4%	16.4%	1.6%	0.0%	0.0%
2017	16.4%	16.4%	16.4%	1.6%	0.0%	0.0%	0.0%
2016	16.7%	16.7%	0.0%	0.0%	0.0%	0.0%	0.0%

* Percentages shown are rounded for display purposes.

Recognition Amounts by Year

Outflows

	2020	2021	2022	2023	2024	2025	Thereafter
City of Northampton	\$ 40,186.96	\$ 40,186.96	\$ 9,187.66	\$ 9,187.66	\$ 6,570.65	\$ 2,511.95	\$ -
Northampton Housing Authority	\$ 76,149.72	\$ 76,149.72	\$ 76,149.72	\$ 69,800.12	\$ 27,637.84	\$ -	\$ -

Inflows

	2020	2021	2022	2023	2024	2025	Thereafter
City of Northampton	\$ 76,149.72	\$ 76,149.72	\$ 76,149.72	\$ 69,800.12	\$ 27,637.84	\$ -	\$ -
Northampton Housing Authority	\$ 40,186.96	\$ 40,186.96	\$ 9,187.66	\$ 9,187.66	\$ 6,570.65	\$ 2,511.95	\$ -

TOTALS

	2020	2021	2022	2023	2024	2025	Thereafter
City of Northampton	\$ (35,962.76)	\$ (35,962.76)	\$ (66,962.06)	\$ (60,612.46)	\$ (21,067.19)	\$ 2,511.95	\$ -
Northampton Housing Authority	\$ 35,962.76	\$ 35,962.76	\$ 66,962.06	\$ 60,612.46	\$ 21,067.19	\$ (2,511.95)	\$ -

Reconciliation of Changes in the NPL

Employer	NPL, Beginning of Measurement Period	Contributions made for FY 2020	Change in Net Deferrals (calculated below)	Pension Expense	Proportion Change	NPL, End of Measurement Period
City of Northampton	\$ 53,390,652	\$ (6,319,807)	\$ (6,438,931)	\$ 7,354,692	\$ 33,911	\$ 48,020,518
Northampton Housing Authority	\$ 3,056,026	\$ (356,880)	\$ (368,467)	\$ 415,386	\$ (33,911)	\$ 2,712,154
TOTAL	\$ 56,446,679	\$ (6,676,687)	\$ (6,807,398)	\$ 7,770,078	\$ -	\$ 50,732,673

Employer	Net Deferrals, Beginning of Measurement Period	Net Deferrals, End of Measurement Period	Change in Net Deferrals
City of Northampton	\$ 6,319,478	\$ (119,452)	\$ (6,438,931)
Northampton Housing Authority	\$ 361,720	\$ (6,747)	\$ (368,467)
TOTAL	\$ 6,681,199	\$ (126,199)	\$ (6,807,398)