

GASB Statements No. 67 and 68
Report for Fiscal Year 2019

Lawrence Retirement System

Lawrence B. Stone
President



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August 29, 2019

Lawrence Retirement Board
354 Merrimack Street, Suite 302
Lawrence, MA 01843

To the Lawrence 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 Lawrence Retirement System performed by Stone Consulting, Inc.

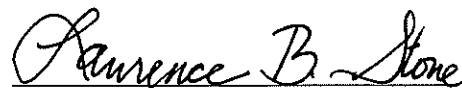
The valuation and this report were prepared using generally accepted actuarial principles and practices and meet the parameters set by the Governmental Accounting Standards Board (GASB).

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 Lawrence and the Lawrence 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 Lawrence or the Lawrence 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, 2018. For GASB 68 the results are as of a valuation date of January 1, 2018, a measurement date of December 31, 2018 and a reporting date of June 30, 2019.

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 Lawrence Retirement System as of December 31, 2018 are as follows:

Total Pension Liability (TPL)	\$ 455,327,152
Plan Fiduciary Net Position (FNP)	<u>220,661,489</u>
System's Net Pension Liability (NPL)	\$ 234,665,662
Plan FNP as a percentage of the TPL	48.5%
Covered Payroll	\$ 75,251,536
Plan NPL as a percentage of Covered Payroll	311.8%
Pension Expense	\$ 22,667,717

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	911
Inactive employees entitled to a return of contributions	530
Active employees	<u>1,580</u>
TOTAL	3,021

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 (01/01/2018)	\$ 441,726,747	\$ 227,442,528	\$ 214,284,219
Changes for the Year:			
Service Cost	9,495,821		9,495,821
Interest	32,766,857		32,766,857
Change in benefit terms	0		0
Differences between expected and actual experience	0		0
Change in assumptions	0		0
Contributions - employer		20,798,277	(20,798,277)
Contributions - employee		6,843,882	(6,843,882)
Net investment income		(5,258,478)	5,258,478
Benefit payments, including refunds of employee contributions	(28,662,273)	(28,662,273)	0
Administrative expense		(502,445)	502,445
Other changes		0	0
Net Changes	<u>13,600,405</u>	<u>(6,781,039)</u>	<u>20,381,443</u>
Balances at end of Measurement Period (12/31/2018)	\$ 455,327,152	\$ 220,661,489	\$ 234,665,662

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

CHANGES IN METHODS, ASSUMPTIONS, AND PLAN PROVISIONS

The results of the January 1, 2018 of the Lawrence Retirement System by Stone Consulting, Inc. were already reflected in the GASB 67 and 68 report for Fiscal Year 2018. As such, there are no new changes to incorporate for this year. There are no changes of assumptions or plan provisions to reflect, and no new experience

Projection of the Net Pension Liability

TOTAL PENSION LIABILITY (TPL)

The Total Pension Liability at the beginning of the measurement period (01/01/2018) 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 8), 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 liability of \$10,285,036 (as of the valuation date) 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. 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 Lawrence Retirement System is 311.8% 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 DEFFERALS

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 71 b]
- 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 11-12.

RESULTS BY EMPLOYER

Exhibits are provided beginning on page 16 which provide individual results for the various employers that make up the Lawrence 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 FY2019 appropriation.

Per GASB 68, the change in proportionality from FY2018 to FY2019 if the individual employers' NPL and deferred inflows and outflows need to be allocated to the individual employers. This is calculated on page 18. These amounts are then recognized over the average remaining service, which is 6.1 years. The recognition of proportion changes is developed on page 19.

Pension Expense for the Fiscal Year Ended June 30, 2019

NOTE*	Description	Fiscal 2019
A	Service Cost	\$ 9,495,821
A, B	Interest on the Total Pension Liability	32,766,857
C	Differences between Expected and Actual Experience	(1,489,650)
D	Changes of Assumptions	1,533,817
D	Changes to Benefit Provisions	0
A	Employee Contributions	(6,843,882)
E	Projected Earnings on Pension Plan Investments	(17,001,094)
F	Differences between Projected and Actual Earnings on Plan Investments	3,703,402
A	Pension Plan Administrative Expense	502,445
A	Other Changes in Fiduciary Net Position	0
	Total Pension Expense	\$ 22,667,717

* 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	\$ 769,486	\$ (6,541,584)
Changes of assumptions	6,288,650	0
Net difference between projected and actual earnings on pension plan investments	<u>9,873,890</u>	<u>0</u>
TOTAL	\$ 16,932,025	\$ (6,541,584)

Year Ending December 31, *	Recognition
2019	\$ 3,642,914
2020	\$ 1,038,448
2021	\$ 873,115
2022	\$ 4,663,815
2023	\$ 172,150
Thereafter	\$ 0

*The years are based on measurement date. For GASB 68, the year ending December 31, 2019 is Fiscal 2020.

NOTES

- A. See the RSI schedule of changes to the net pension liability, on page 4.
- 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	\$ 441,726,747	100%	7.50%	\$ 33,129,506
Service cost	9,495,821	100%	7.50%	712,187
Benefit payments	(28,662,273)	50%	7.50%	(1,074,835)
Total interest on the NPL				\$ 32,766,857

- 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 11.
- 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 11.
- 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	\$ 227,442,528	100%	7.50%	\$ 17,058,190
Employer contributions	20,798,277	50%	7.50%	779,935
Employee contributions	6,843,882	50%	7.50%	256,646
Benefit payments	(28,662,273)	50%	7.50%	(1,074,835)
Administrative expense and other	(502,445)	50%	7.50%	(18,842)
Total projected earnings				\$ 17,001,094
Actual investment earnings				(5,258,478)
Difference: (Gain)/Loss				\$ 22,259,572

- 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 11.

Discount Sensitivity

The following presents the Lawrence Retirement System's Net Pension Liability calculated at the valuation discount rate of 7.50%, as well as at discount rates one percent lower (6.50%) and one percent higher (8.50%).

Fiscal Year	1% Decrease (6.50%)	Current Discount Rate (7.50%)	1% Increase (8.50%)
2019	\$ 284,626,838	\$ 234,665,662	\$ 191,814,511

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 Lawrence Retirement System and PRIT's asset consultant, NEPC. 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 2.25% inflation assumption.

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return (Geometric Average)
US Equity	13.0%	5.25%
International Equities	13.0%	5.43%
Emerging Equities	5.0%	6.90%
Hedged Equity	8.0%	4.54%
Core Bonds	6.0%	2.07%
Short-Term Fixed Income	2.0%	1.72%
20+ Yr. Treasury STRIPS	3.0%	1.22%
TIPS	4.0%	1.71%
Value-Added Fixed Income	8.0%	5.21%
Private Equity	13.0%	8.70%
Real Estate	10.0%	4.09%
Timberland	4.0%	4.65%
Portfolio Completion (PCS)	11.0%	4.41%

Development of Results

DISCOUNT RATE

Projections were made using a discount rate assumption of 7.50%, 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 4.25% per year. The Lawrence 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 7.50% includes the effect 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
2016	\$ -	6.9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2017	\$ (1,573,571)	6.9	\$ -	\$ (1,677,329)	\$ (1,677,329)	\$ (1,677,329)	\$ (1,677,329)	\$ (1,677,329)	\$ (1,677,329)	\$ (1,677,329)	\$ (1,509,596)	\$ -	\$ -
2018	\$ 1,144,844	6.1	\$ -	\$ -	\$ -	\$ 187,679	\$ 187,679	\$ 187,679	\$ 187,679	\$ 187,679	\$ 187,679	\$ 18,768	\$ -
2019	\$ -	6.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net increase (decrease) in pension expense			\$ -	\$ -	\$ (1,677,329)	\$ (1,489,650)	\$ (1,489,650)	\$ (1,489,650)	\$ (1,489,650)	\$ (1,489,650)	\$ (1,321,917)	\$ 18,768	\$ -

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
2016	\$ -	6.9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2017	\$ -	6.9	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2018	\$ 9,356,284	6.1	\$ -	\$ -	\$ -	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 153,382	\$ -
2019	\$ -	6.1	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Net increase (decrease) in pension expense			\$ -	\$ -	\$ -	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 1,533,817	\$ 153,382	\$ -

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
2015	\$ 523,278	5	\$ 104,656	\$ 104,656	\$ 104,656	\$ 104,656	\$ 104,656	\$ -	\$ -	\$ -	\$ -
2016	\$ 13,022,328	5	\$ -	\$ 2,604,466	\$ 2,604,466	\$ 2,604,466	\$ 2,604,466	\$ 2,604,466	\$ -	\$ -	\$ -
2017	\$ 826,668	5	\$ -	\$ -	\$ 165,334	\$ 165,334	\$ 165,334	\$ 165,334	\$ 165,334	\$ -	\$ -
2018	\$ (18,114,834)	5	\$ -	\$ -	\$ -	\$ (3,622,967)	\$ (3,622,967)	\$ (3,622,967)	\$ (3,622,967)	\$ (3,622,967)	\$ -
2019	\$ 22,259,572	5	\$ -	\$ -	\$ -	\$ -	\$ 4,451,914	\$ 4,451,914	\$ 4,451,914	\$ 4,451,914	\$ 4,451,914
Net increase (decrease) in pension expense			\$ 104,656	\$ 2,709,121	\$ 2,874,455	\$ (748,512)	\$ 3,703,402	\$ 3,598,747	\$ 994,281	\$ 828,948	\$ 4,451,914

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, 2019 (c)	BALANCES AT JUNE 30, 2019	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2016	\$ -	\$ -	\$ -	\$ -	\$ -
2017	\$ -	\$ (11,573,571)	\$ (5,031,987)	\$ -	\$ (6,541,584)
2018	\$ 1,144,844	\$ -	\$ 375,359	\$ 769,486	\$ -
2019	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL				\$ 769,486	\$ (6,541,584)

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, 2019 (c)	BALANCES AT JUNE 30, 2019	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2016	\$ -	\$ -	\$ -	\$ -	\$ -
2017	\$ -	\$ -	\$ -	\$ -	\$ -
2018	\$ 9,356,284	\$ -	\$ 3,067,634	\$ 6,288,650	\$ -
2019	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL				\$ 6,288,650	\$ -

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, 2019 (c)	BALANCES AT JUNE 30, 2019	
				Deferred Outflows of Resources (a) - (c)	Deferred Inflows of Resources (b) - (c)
2015	\$ 523,278	\$ -	\$ 523,278	\$ -	\$ -
2016	\$ 13,022,328	\$ -	\$ 10,417,862	\$ 2,604,466	\$ -
2017	\$ 826,668	\$ -	\$ 496,001	\$ 330,667	\$ -
2018	\$ -	\$ (18,114,834)	\$ (7,245,933)	\$ -	\$ (10,868,900)
2019	\$ 22,259,572	\$ -	\$ 4,451,914	\$ 17,807,658	\$ -
TOTAL				\$ 20,742,790	\$ (10,868,900)
			NET TOTAL	\$ 9,873,890	

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

(Amounts in Thousands)

	Fiscal Year *									
	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
TOTAL PENSION LIABILITY										
Service cost	9,496	9,109	8,737	8,829	8,469					
Interest	32,767	32,023	31,842	30,713	29,607					
Change of benefit terms	-	-	-	-	-					
Differences between expected and actual experience	-	1,145	(11,574)	-	-					
Change of assumptions	-	9,356	-	-	-					
Benefit payments, including refunds of employee contributions	(28,662)	(27,995)	(26,093)	(23,677)	(24,653)					
Net change in total pension liability	13,600	23,638	2,913	15,865	13,424					
Total pension liability - beginning	441,727	418,089	415,176	399,310	385,887					
Total pension liability - ending	455,327	441,727	418,089	415,176	399,310					
PLAN FIDUCIARY NET POSITION										
Contributions - employer	20,798	20,606	19,329	18,509	17,323					
Contributions - employee	6,844	6,781	6,851	6,706	6,951					
Net Investment Income	(5,258)	33,088	13,190	1,014	12,433					
Benefit payments, including refunds of employee contributions	(28,662)	(27,995)	(26,093)	(23,677)	(24,653)					
Administrative expense	(502)	(503)	(473)	(470)	(455)					
Other	-	-	-	-	-					
Net change in plan fiduciary net position	(6,781)	31,977	12,806	2,082	11,599					
Plan fiduciary net position - beginning	227,443	195,466	182,660	180,579	168,979					
Plan fiduciary net position - end	220,661	227,443	195,466	182,660	180,579					
Lawrence net pension liability - ending	234,666	214,284	222,623	232,515	218,732					
Plan fiduciary net position as a percentage of the total pension liability	48.5%	51.5%	46.8%	44.0%	45.2%					
Covered payroll	75,252	77,422	73,742	74,625	71,253					
Lawrence's net pension liability as a percentage of covered payroll	311.8%	276.8%	301.9%	311.6%	307.0%					

* Information not available prior to 2015

Note: sums may not total due to rounding

Schedule of Plan Contributions

(Amounts in Thousands)

Fiscal Year	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Actuarially determined contribution	\$ 20,757	\$ 20,684	\$ 19,320	\$ 18,515	\$ 17,121					
Contributions in relation to the actuarially determined contribution	<u>(20,798)</u>	<u>(20,606)</u>	<u>(19,329)</u>	<u>(18,509)</u>	<u>(17,033)</u>					
Contribution deficiency / (excess)*	(42)	78	(9)	6	88					
Covered payroll	\$ 77,158	\$ 79,315	\$ 75,582	\$ 74,625	\$ 72,939					
Contributions as a percentage of covered payroll	27.0%	26.0%	25.6%	24.8%	23.4%					

* Information not available for years prior to 2015

* Excess is due to Federal Grants

**GASB Statement No. 67, Paragraph 30 b. (4)
Money-Weighted Rate of Return, 2018**

		Net External Cash Flows					
		Beginning of month	Middle of Month	End of Month	Periods Invested**	Investment Return	Cash Flow with Return
Starting Value* (12/31/2017)	\$	228,391,059.48			12	\$ (5,227,921.59)	\$ 223,163,137.89
<i>Cash Flows:</i>							
January		77,998.65	261,217.72	-2,193,704.52	11	38,555.76	(1,815,832.39)
February		315,514.39	60,499.69	-2,337,259.26	10	36,829.25	(1,924,415.93)
March		302,737.49	204,344.28	-2,729,385.76	9	37,494.74	(2,184,809.25)
April		335,243.68	298,948.57	-2,295,003.86	8	24,521.64	(1,636,289.97)
May		279,718.67	233,149.77	-2,553,478.39	7	26,625.03	(2,013,984.92)
June		235,984.53	244,725.55	-2,212,540.10	6	19,252.74	(1,712,577.28)
July		18,618,349.91	1,137,620.54	-2,184,879.31	5	(205,353.37)	17,365,737.77
August		203,906.79	38,573.00	-1,888,380.87	4	12,228.42	(1,633,672.66)
September		277,315.72	1,027,709.73	-2,410,644.53	3	4,865.10	(1,100,753.98)
October		264,965.31	267,151.69	-2,450,882.55	2	6,625.49	(1,912,140.06)
November		381,672.43	319,047.35	-2,011,767.77	1	1,486.01	(1,309,561.98)
December		76,903.67	416,576.57	-1,840,169.07	0	(549.99)	(1,347,238.82)
Ending Value* (12/31/2018)	\$	\$221,937,498.40			Sum:	\$ (5,225,340.79)	\$ 221,937,498.40

* 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 return, and beginning of period cash flows are given an additional full period.

Return Rate:	-2.29%
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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 (8.50%)	1% Decrease (6.50%)
City of Lawrence	\$ 68,188,086	\$ 212,650,874	311.9%	\$ 173,883,437	\$ 257,850,750
Greater Lawrence Regional Vocational Tech	\$ 3,571,409	\$ 10,908,478	305.4%	\$ 8,911,614	\$ 13,236,668
Lawrence Housing Authority	\$ 3,208,439	\$ 10,242,798	319.2%	\$ 8,318,781	\$ 12,486,055
M. V. R. T. A.	\$ 283,601	\$ 863,513	304.5%	\$ 700,679	\$ 1,053,366
TOTAL	\$ 75,251,536	\$ 234,665,662	311.8%	\$ 191,814,511	\$ 284,626,838

Employer	Actually determined contribution FY2019	Contributions made for FY 2019	Contribution deficiency (excess)	Contributions as a percentage of covered payroll***
City of Lawrence	\$ 18,824,290	\$ (18,862,020)	\$ (37,730)	27.0%
Greater Lawrence Regional Vocational Tech	\$ 963,731	\$ (965,674)	\$ (1,943)	26.3%
Lawrence Housing Authority	\$ 893,373	\$ (895,246)	\$ (1,873)	27.3%
M. V. R. T. A.	\$ 75,178	\$ (75,336)	\$ (158)	26.0%
TOTAL	\$ 20,756,572	\$ (20,798,277)	\$ (41,705)	27.0%

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 Lawrence	90.47%	\$ 20,541,181	\$ (211,714)	\$ 20,329,467
Greater Lawrence Regional Vocational Tech	4.66%	\$ 1,053,713	\$ 195,922	\$ 1,249,635
Lawrence Housing Authority	4.49%	\$ 989,411	\$ (105,085)	\$ 884,326
M. V. R. T. A.	0.38%	\$ 83,412	\$ 120,878	\$ 204,290
TOTAL	100.00%	\$ 22,667,717		

* Covered Payroll is the projected amount for the 2018 calendar year based on employee data as of December 31, 2017

** ERI liability used in the proportionate share of NPL is \$7,066,559 for City, \$319,079 for GLRVT, and \$39,708 for Housing.

*** Here the Covered Payroll figure is projected for Fiscal Year 2019, 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 Lawrence	\$ 697,297	\$ 5,698,690	\$ 8,947,587	\$ 248,532	\$ -	\$ 15,592,106
Greater Lawrence Regional Vocational Tech	\$ 35,770	\$ 292,329	\$ 458,990	\$ 975,554	\$ -	\$ 1,760,642
Lawrence Housing Authority	\$ 33,587	\$ 274,490	\$ 430,980	\$ 35,226	\$ -	\$ 774,284
M. V. R. T. A.	\$ 2,832	\$ 23,141	\$ 36,334	\$ 486,040	\$ -	\$ 548,345
TOTAL	\$ 769,486	\$ 6,288,650	\$ 9,873,890	\$ 1,743,352	\$ -	\$ 18,675,378

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 Lawrence	\$ 5,927,895	\$ -	\$ -	\$ 1,075,160	N/A	\$ 7,003,055
Greater Lawrence Regional Vocational Tech	\$ 304,087	\$ -	\$ -	\$ 166,375	N/A	\$ 470,462
Lawrence Housing Authority	\$ 285,530	\$ -	\$ -	\$ 501,817	N/A	\$ 787,347
M. V. R. T. A.	\$ 24,071	\$ -	\$ -	\$ -	N/A	\$ 24,071
TOTAL	\$ 6,541,584	\$ -	\$ -	\$ 1,743,352	N/A	\$ 8,284,936

Recognition of Deferred Outflows and Deferred Inflows

Employer	AMOUNT TO BE RECOGNIZED FOR THE YEAR ENDING DECEMBER 31,					
	2019	2020	2021	2022	2023	Thereafter
City of Lawrence	\$ 3,089,446	\$ 729,314	\$ 577,365	\$ 4,008,447	\$ 180,815	\$ 3,664
Greater Lawrence Regional Vocational Tech	\$ 365,263	\$ 244,194	\$ 239,849	\$ 434,845	\$ 7,391	\$ (1,363)
Lawrence Housing Authority	\$ 53,922	\$ (59,759)	\$ (68,190)	\$ 92,756	\$ (28,393)	\$ (3,400)
M. V. R. T. A.	\$ 134,283	\$ 124,699	\$ 124,091	\$ 127,766	\$ 12,337	\$ 1,099
TOTAL	\$ 3,642,914	\$ 1,038,448	\$ 875,115	\$ 4,663,815	\$ 172,150	\$ 0

* Deferred Outflows and Inflows due to experience, assumptions, and investment return are allocated to each employer according to their proportion 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			FY2019 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 Lawrence	\$ 201,332,503	\$ 201,541,133	\$ 208,629	\$ 18,847,119	\$ 18,862,020	\$ 14,901
Greater Lawrence Regional Vocational Tech	\$ 10,420,568	\$ 10,338,575	\$ (81,993)	\$ 966,812	\$ 965,674	\$ (1,137)
Lawrence Housing Authority	\$ 9,902,530	\$ 9,707,673	\$ (194,857)	\$ 907,813	\$ 895,246	\$ (12,567)
M. V. R. T. A.	\$ 750,179	\$ 818,400	\$ 68,221	\$ 76,533	\$ 75,336	\$ (1,196)
TOTAL	\$ 222,405,780	\$ 222,405,780	\$ (16,901,192)	\$ 20,798,277	\$ 20,798,277	\$ -

Employer	Total Proportion Change (A) + (B)	Recognized as Pension Expense*		Deferred for later recognition
		Recognized as Pension Expense*	Deferred for later recognition	
City of Lawrence	\$ 223,530	\$ 36,644	\$ 186,886	
Greater Lawrence Regional Vocational Tech	\$ (83,131)	\$ (13,628)	\$ (69,503)	
Lawrence Housing Authority	\$ (207,424)	\$ (34,004)	\$ (173,420)	
M. V. R. T. A.	\$ 67,025	\$ 10,988	\$ 56,037	
TOTAL	\$ -	\$ -	\$ -	

* Based on an average remaining service life of 6.1 years.

Recognition of Proportion Changes

Proportion Changes by Employer / Year

Employer	2019	2018	2017	2016	2015	2014	2013
City of Lawrence	\$ 223,530.42	\$ (721,559.71)	\$ (1,044,159.41)	\$ 146,675.68	N/A	N/A	N/A
Greater Lawrence Regional Vocational Tech	\$ (83,130.72)	\$ 793,981.26	\$ 778,274.39	\$ (230,490.36)	N/A	N/A	N/A
Lawrence Housing Authority	\$ (207,424.34)	\$ (116,060.86)	\$ (442,995.12)	\$ 83,814.68	N/A	N/A	N/A
M. V. R. T. A.	\$ 67,024.65	\$ 43,639.30	\$ 708,880.14	\$ -	N/A	N/A	N/A

Average Remaining Service Life by Year

2019	6.1
2018	6.1
2017	6.9
2016	6.9

Recognition Percentages by Year

Year of Gain/Loss	Percentage Recognized by Year*						
	2019	2020	2021	2022	2023	2024	Thereafter
2019	16.4%	16.4%	16.4%	16.4%	16.4%	16.4%	1.6%
2018	16.4%	16.4%	16.4%	16.4%	16.4%	16.4%	0.0%
2017	14.5%	14.5%	14.5%	14.5%	13.0%	0.0%	0.0%
2016	14.5%	14.5%	14.5%	13.0%	0.0%	0.0%	0.0%

* Percentages shown are rounded for display purposes.

Recognition Amounts by Year

Outflows

	2019	2020	2021	2022	2023	2024	Thereafter
City of Lawrence	\$ 57,901.68	\$ 57,901.68	\$ 57,901.68	\$ 55,775.94	\$ 36,644.33	\$ 36,644.33	\$ 3,664.43
Greater Lawrence Regional Vocational Tech	\$ 242,954.25	\$ 242,954.25	\$ 242,954.25	\$ 242,954.25	\$ 231,674.91	\$ 13,016.09	\$ -
Lawrence Housing Authority	\$ 12,147.05	\$ 12,147.05	\$ 12,147.05	\$ 10,932.35	\$ -	\$ -	\$ -
M. V. R. T. A.	\$ 120,877.88	\$ 120,877.88	\$ 120,877.88	\$ 120,877.88	\$ 110,604.26	\$ 11,703.05	\$ 1,098.76

Inflows

	2019	2020	2021	2022	2023	2024	Thereafter
City of Lawrence	\$ 269,615.93	\$ 269,615.93	\$ 269,615.93	\$ 269,615.93	\$ 254,483.18	\$ 11,828.85	\$ -
Greater Lawrence Regional Vocational Tech	\$ 47,032.39	\$ 47,032.39	\$ 47,032.39	\$ 43,691.95	\$ 13,627.99	\$ 13,627.99	\$ 1,362.80
Lawrence Housing Authority	\$ 117,232.55	\$ 117,232.55	\$ 117,232.55	\$ 117,232.55	\$ 110,812.33	\$ 35,906.63	\$ 3,400.40
M. V. R. T. A.	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

TOTALS

	2019	2020	2021	2022	2023	2024	Thereafter
City of Lawrence	\$ (211,714.25)	\$ (211,714.25)	\$ (211,714.25)	\$ (213,839.99)	\$ (217,838.85)	\$ 24,815.48	\$ 3,664.43
Greater Lawrence Regional Vocational Tech	\$ 195,921.87	\$ 195,921.87	\$ 195,921.87	\$ 199,262.31	\$ 218,046.93	\$ (611.90)	\$ (1,362.80)
Lawrence Housing Authority	\$ (105,085.50)	\$ (105,085.50)	\$ (105,085.50)	\$ (106,300.20)	\$ (110,812.33)	\$ (35,906.63)	\$ (3,400.40)
M. V. R. T. A.	\$ 120,877.88	\$ 120,877.88	\$ 120,877.88	\$ 120,877.88	\$ 110,604.26	\$ 11,703.05	\$ 1,098.76

Reconciliation of Changes in the NPL

Employer	NPL, Beginning of Measurement Period	Contributions made for FY 2019	Change in Net Deferrals (calculated below)	Pension Expense	Proportion Change	NPL, End of Measurement Period
City of Lawrence	\$ 193,980,472	\$ (18,862,020)	\$ 16,767,710	\$ 20,541,181	\$ 223,530	\$ 212,650,874
Greater Lawrence Regional Vocational Tech	\$ 10,040,042	\$ (965,674)	\$ 863,528	\$ 1,053,713	\$ (83,131)	\$ 10,908,478
Lawrence Housing Authority	\$ 9,540,920	\$ (895,246)	\$ 815,136	\$ 989,411	\$ (207,424)	\$ 10,242,798
M. V. R. T. A.	\$ 722,785	\$ (75,336)	\$ 65,629	\$ 83,412	\$ 67,025	\$ 863,513
TOTAL	\$ 214,284,219	\$ (20,798,277)	\$ 18,512,003	\$ 22,667,717	\$ -	\$ 234,665,662

Employer	Net Deferrals, Beginning of Measurement Period	Net Deferrals, End of Measurement Period	Change in Net Deferrals
City of Lawrence	\$ (7,352,031)	\$ 9,415,679	\$ 16,767,710
Greater Lawrence Regional Vocational Tech	\$ (380,526)	\$ 483,002	\$ 863,528
Lawrence Housing Authority	\$ (361,609)	\$ 453,527	\$ 815,136
M. V. R. T. A.	\$ (27,394)	\$ 38,234	\$ 65,629
TOTAL	\$ (8,121,561)	\$ 10,390,442	\$ 18,512,003