

Middlesex County Retirement System

**Governmental Accounting Standards Board
(GASB) Statements No. 67 and 68
Accounting Valuation Report**

as of December 31, 2019



This report has been prepared at the request of the Middlesex County Retirement Board to assist the Board and the member units in preparing their financial reports for their liabilities associated with the Middlesex County Retirement System. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Middlesex County Retirement Board and may only be provided to other parties in its entirety. The measurements shown in this actuarial valuation may not be applicable for other purposes.

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June 26, 2020

Retirement Board
Middlesex County Retirement System
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Dear Board Members:

We are pleased to submit this Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 Accounting Valuation as of December 31, 2019 for the Middlesex County Retirement System, a cost-sharing multiple employer defined benefit pension plan. It contains the actuarial information that will need to be disclosed in order to comply with GASB 67 and 68. Please refer to the Middlesex County Retirement System Actuarial Valuation Report as of January 1, 2020, for the data, assumptions and plan of benefits underlying these calculations.

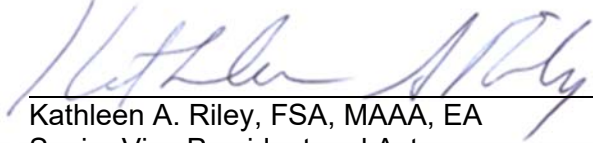
This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist the Board and the member units in preparing their financial reports for their liabilities associated with the Middlesex County Retirement System. The census and financial information on which our calculations were based were provided by the staff of the Middlesex County Retirement System. That assistance is gratefully acknowledged.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.

The actuarial calculations were completed under my supervision. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in the actuarial valuation is complete and accurate. Further, in my opinion, the assumptions as approved by the Board are reasonably related to the experience of and expectations for the Middlesex County Retirement System.

We look forward to reviewing this report with you and to answering any questions.

Sincerely,
Segal

A handwritten signature in blue ink, appearing to read "Kathleen A. Riley", is written over a horizontal line.

Kathleen A. Riley, FSA, MAAA, EA
Senior Vice President and Actuary

Table of Contents

Section 1: Actuarial Valuation Summary.....	4
Purpose	4
Significant issues.....	4
Important information about actuarial valuations	5
Section 2: GASB Information	7
Exhibit 1 – Net Pension Liability	7
Exhibit 2 – Schedule of Changes in Net Pension Liability – Last Two Fiscal Years.....	10
Exhibit 3 – Schedule of Contributions – Last Six Fiscal Years	12
Exhibit 4 – Pension Expense.....	13
Exhibit 5 – Determination of Proportionate Share	15
Exhibit 6 – Determination of Proportionate Share Amounts by Employer	19
Appendix – Glossary of Terms.....	35

Section 1: Actuarial Valuation Summary

Purpose

This report has been prepared by Segal to present certain disclosure information required by Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 as of December 31, 2019. This report is based on the Middlesex County Retirement System Actuarial Valuation and Review as of January 1, 2020, which reflects:

- The benefit provisions of Massachusetts General Law Chapter 32;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of December 31, 2019, provided by the staff of the Retirement System;
- The assets of the System as of December 31, 2019, provided by the staff of the Retirement System;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions, regarding employee terminations, retirement, death, etc.

Significant issues

The following key findings were the result of this actuarial valuation:

1. It is important to note that this valuation is based on plan assets as of December 31, 2019. Due to the COVID-19 pandemic, market conditions have changed significantly since the valuation date. The Plan's actuarial status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year.
2. The Net Pension Liability (NPL) is equal to the difference between the Total Pension Liability (TPL) and the Plan's Fiduciary Net Position. The Plan Fiduciary Net Position is equal to the market value of assets and therefore, the NPL measure is very similar to an Unfunded Actuarial Accrued Liability (UAAL) on a market value basis. The NPL increased from \$1.559 billion as of December 31, 2018 to \$1.600 billion as of December 31, 2019 and the Plan's Fiduciary Net Position as a percent of the TPL increased from 46.40% to 49.45%.
3. The NPL measured as of December 31, 2019 and December 31, 2018 was determined based upon the results of the actuarial valuation as of January 1, 2020 and January 1, 2018, respectively.
4. The discount rate used to measure the TPL and NPL as of December 31, 2019 and December 31, 2018 was 7.30% and 7.50%, respectively.

Section 1: Actuarial Valuation Summary

Important information about actuarial valuations

In order to prepare an actuarial valuation, Segal relies on a number of input items. These include:

Plan of Benefits:	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan description in this report (as well as the plan summary included in our funding valuation report) to confirm that Segal has correctly interpreted the plan of benefits.
Participant Data:	An actuarial valuation for a plan is based on data provided to the actuary by the Middlesex County Retirement System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets:	The valuation is based on the market value of assets as of the valuation date, as provided by the Middlesex County Retirement System. The Middlesex County Retirement System uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial Assumptions:	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results, that does not mean that the previous assumptions were unreasonable.

Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

The valuation is prepared at the request of the Middlesex County Retirement Board to assist the Board and the member units in preparing items related to the pension plan in their financial reports. Segal is not responsible for the use or misuse of its report, particularly by any other party.

An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

Sections of this report may include actuarial results that are not rounded, but that does not imply precision.

If the Middlesex County Retirement Board is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.

Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the Middlesex County Retirement System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Middlesex County Retirement System.

Section 2: GASB Information

Exhibit 1 – Net Pension Liability

	December 31, 2019	December 31, 2018
Components of the Net Pension Liability		
Total Pension Liability	\$3,165,584,276	\$2,909,506,224
Plan Fiduciary Net Position	1,565,528,261	1,350,039,767
Net Pension Liability	1,600,056,015	1,559,466,457
Plan Fiduciary Net Position as a percentage of the Total Pension Liability*	49.45%	46.40%

* These funded percentages are not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.

Actuarial assumptions. The total pension liability as of December 31, 2019 was measured by an actuarial valuation as of January 1, 2020, using the following actuarial assumptions, applied to all periods included in the measurement:

Salary Increases:	Varies by length of service with ultimate rates of 4.00% for Group 1, 4.25% for Group 2 and 4.50% for Group 4
Wage Inflation:	3.25%
Net Investment Return:	7.30% (previously, 7.50%)
Cost of Living Adjustment:	3% of first \$16,000 (previously, 3% of first \$14,000)
Mortality Rates:	<i>Pre-Retirement:</i> RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017 <i>Healthy Retiree:</i> RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2017 <i>Disabled Retiree:</i> RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year projected generationally with Scale MP-2017

Section 2: GASB Information

Target asset allocation

The long-term expected rate of return on pension plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of inflation) are developed for each major asset class. These returns are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and adding expected inflation. The target allocation (approved by the Board) and projected arithmetic real rates of return for each major asset class, after deducting inflation, but before investment expenses, used in the derivation of the long-term expected investment rate of return assumption are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Domestic equity	21.00%	6.15%
International developed markets equity	13.00%	6.78%
International emerging markets equity	5.00%	8.65%
Core fixed income	15.00%	1.11%
High-yield fixed income	8.00%	3.51%
Real estate	10.00%	4.33%
Commodities	4.00%	4.13%
Hedge fund, GTAA, Risk parity	11.00%	3.19%
Private equity	<u>13.00%</u>	9.99%
Total	100%	

Note: Some asset classes included in the pension plan's target asset allocation have been combined.

Discount rate. The discount rate used to measure the Total Pension Liability (TPL) was 7.30% as of December 31, 2019 and 7.50% as of December 31, 2018. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the actuarially determined contribution rates. For this purpose, only employer contributions that are intended to fund benefits for current plan members and their beneficiaries are included. Projected employer contributions that are intended to fund the service costs for future plan members and their beneficiaries, as well as projected contributions from future plan members, are not included. Based on those assumptions, the Plan Fiduciary Net Position (FNP) was projected to be available to make all projected future benefit payments for current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL as of both December 31, 2019 and December 31, 2018.

Section 2: GASB Information

Discount rate sensitivity

Sensitivity of the Net Pension Liability to changes in the discount rate. The following presents the Net Pension Liability (NPL) of the Middlesex County Retirement System as of December 31, 2019 calculated using the discount rate of 7.30%, as well as what the Middlesex County Retirement System's NPL would be if it were calculated using a discount rate that is 1-percentage-point lower (6.30%) or 1-percentage-point higher (8.30%) than the current rate.

Net Pension Liability	1% Decrease (6.30%)	Current Discount Rate (7.30%)	1% Increase (8.30%)
Middlesex County Retirement System's net pension liability as of December 31, 2019	\$1,966,342,109	\$1,600,056,015	\$1,291,835,664

Section 2: GASB Information

Exhibit 2 – Schedule of Changes in Net Pension Liability – Last Two Fiscal Years

	December 31, 2019	December 31, 2018
Total Pension Liability		
Service cost	\$66,816,001	\$64,615,910
Interest	216,905,942	208,614,148
Change of benefit terms	29,156,339	0
Differences between expected and actual experience	46,671,873	0
Changes of assumptions or other inputs	65,013,900	0
Benefit payments, including refunds of member contributions	<u>-168,486,003</u>	<u>-161,259,804</u>
Net change in Total Pension Liability	\$256,078,052	\$111,970,254
Total Pension Liability – beginning	<u>2,909,506,224</u>	<u>2,797,535,970</u>
Total Pension Liability – ending	\$3,165,584,276	\$2,909,506,224
Plan Fiduciary Net Position		
Contributions – employer	\$129,685,754	\$120,614,676
Contributions – employee	49,170,931	46,670,212
Net investment income	208,470,212	-31,062,801
Benefit payments, including refunds of member contributions	<u>-168,486,003</u>	<u>-161,259,804</u>
Administrative expense	<u>-3,352,400</u>	<u>-3,273,735</u>
Net change in Plan Fiduciary Net Position	\$215,488,494	-\$28,311,452
Plan Fiduciary Net Position – beginning	<u>1,350,039,767</u>	<u>1,378,351,219</u>
Plan Fiduciary Net Position – ending	\$1,565,528,261	\$1,350,039,767
Net Pension Liability – ending	1,600,056,015	1,559,466,457
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	49.45%	46.40%
Covered employee payroll ¹	\$492,109,775	\$471,115,185
Plan Net Pension Liability as percentage of covered employee payroll	325.14%	331.02%

¹ Covered employee payroll for 2019 and 2018 as estimated in the January 1, 2020 and January 1, 2018 funding valuations, respectively.
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Middlesex County Retirement System

Section 2: GASB Information

Notes to schedule:

Changes in Actuarial Assumptions:	Effective January 1, 2020: • The net investment return assumption was lowered from 7.50% to 7.30%.
Changes in Plan Provisions:	Effective January 1, 2020: • As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$16,000 as of July 1, 2019.

Section 2: GASB Information

Exhibit 3 – Schedule of Contributions – Last Six Fiscal Years

Year Ended December 31	Actuarially Determined Contributions ¹	Contributions in Relation to the Actuarially Determined Contributions	Contribution Deficiency / (Excess)	Covered-Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2014	\$92,826,743	\$93,400,946	-\$574,203	\$415,752,810	22.47%
2015	98,792,642	99,820,481	-1,027,839	432,382,921	23.09%
2016	105,246,797	107,067,707	-1,820,910	439,644,322	24.35%
2017	112,017,087	115,426,815	-3,409,728	451,777,105	25.55%
2018	119,298,291	120,614,676	-1,316,385	471,115,185	25.60%
2019	127,151,838	129,685,754	-2,533,916	492,109,775	26.35%

Notes to schedule:

Valuation date:	Actuarial determined contribution for year ended December 31, 2019 is determined with the January 1, 2018 actuarial valuation.				
Actuarial cost method:	Entry Age Normal Cost Method				
Amortization method:	Prior year's total contribution increased by 6.5% for fiscal 2020 through fiscal 2027, and thereafter the remaining unfunded liability will be amortized on a 4.0% annual increasing basis; ERI liability amortized in level payments.				
Remaining amortization period:	17 years from July 1, 2018 for non-ERI liability, 1 year from July 1, 2018 for 2002 ERI, 2 years from July 1, 2018 for 2003 ERI, and 4 years from July 1, 2018 for 2010 ERI.				
Asset valuation method:	Market value of assets less unrecognized return in each of the last five years. Unrecognized return is equal to the difference between the actual and expected return on a market value basis, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.				
Actuarial assumptions:					
• Investment rate of return	7.50% (previously, 7.75%)				
• Discount rate	7.50% (previously, 7.75%)				
• Wage inflation rate	3.25% (previously, 3.50%)				
• Projected salary increases	Varies by length of service with ultimate rates of 4.00% for Group 1, 4.25% for Group 2 and 4.50% for Group 4 (previously, ultimate rates of 4.25%, 4.50%, and 4.75% for Groups 1, 2 and 4, respectively)				
• Cost of living adjustments	3% of first \$14,000				
Plan membership:					
• Retired participants and beneficiaries receiving benefits					5,531
• Inactive participants entitled to a return of their employee contributions					2,771
• Inactive participants with a vested right to a deferred or immediate benefit					343
• Active participants					<u>9,168</u>
• Total					17,813

¹ The Actuarially Determined Contribution for 2019 is based on the results of the January 1, 2018 actuarial valuation..

Section 2: GASB Information

Exhibit 4 – Pension Expense

Reporting Date for Employer under GASB 68 Measurement Date for Employer under GASB 68	June 30, 2020 December 31, 2019	June 30, 2019 December 31, 2018
Components of Pension Expense		
Service cost	\$66,816,001	\$64,615,910
Interest on the Total Pension Liability	216,905,942	208,614,148
Current-period benefit changes	29,156,339	0
Expensed portion of current-period difference between expected and actual experience in the Total Pension Liability	9,334,373	0
Expensed portion of current-period changes of assumptions	13,002,780	0
Member contributions	-49,170,931	-46,670,212
Projected earnings on plan investments	-101,516,168	-103,479,517
Expensed portion of current-period differences between actual and projected earnings on plan investments	-21,390,808	26,908,462
Administrative expense	3,352,400	3,273,735
Recognition of beginning of year deferred outflows of resources as pension expense	85,363,530	59,469,300
Recognition of beginning of year deferred inflows of resources as pension expense	-21,371,563	-21,371,563
Pension Expense	\$230,481,895	\$191,360,263

Section 2: GASB Information

Deferred outflows of resources and deferred inflows of resources

Reporting Date for Employer under GASB 68	June 30, 2020	June 30, 2019
Measurement Date for Employer under GASB 68	December 31, 2019	December 31, 2018
Deferred Outflows of Resources		
Changes in proportion and differences between employer's contributions and proportionate share of contributions	\$43,163,151	\$41,415,998
Changes of assumptions	110,189,599	96,917,795
Net difference between projected and actual earnings on plan investments	0	69,511,142
Difference between expected and actual experience in the Total Pension Liability	<u>38,932,789</u>	<u>3,190,580</u>
Total Deferred Outflows of Resources	\$192,285,539	\$211,035,515
Deferred Inflows of Resources		
Changes in proportion and differences between employer's contributions and proportionate share of contributions	\$43,163,151	\$41,415,998
Changes of assumptions	0	0
Net difference between projected and actual earnings on plan investments	41,521,333	0
Difference between expected and actual experience in the Total Pension Liability	<u>3,623,756</u>	<u>5,435,635</u>
Total Deferred Inflows of Resources	\$88,308,240	\$46,851,633
Deferred outflows of resources and deferred inflows of resources related to pension will be recognized as follows:		
Reporting Date for Employer under GASB 68 Year Ended June 30:		
2020	N/A	\$63,991,967
2021	\$49,253,729	48,307,383
2022	25,922,414	24,976,068
2023	27,854,810	26,908,464
2024	946,346	0
Thereafter	0	0

Note: Average expected remaining service life as of December 31, 2019 and December 31, 2018 is 5 years.

Section 2: GASB Information

Exhibit 5 – Determination of Proportionate Share

Employer Name	FY 2019 Total Contributions	Share of NPL as of January 1, 2019	Percent of Total NPL	FY 2020 Total Contributions	Share of NPL as of January 1, 2020 ¹	Percent of Total NPL
Middlesex County Retirement Board	\$368,576	\$0	0.000000%	\$351,211	\$0	0.000000%
Middlesex County	0	0	0.000000%	0	0	0.000000%
Middlesex Hospital	0	0	0.000000%	0	0	0.000000%
Town of Acton	3,690,854	53,545,751	3.433594%	4,236,342	54,966,604	3.435292%
Town of Ashby	155,917	2,175,376	0.139495%	237,579	1,941,210	0.121321%
Town of Ashland	2,923,952	36,199,958	2.321304%	3,086,828	37,703,972	2.356416%
Town of Ayer	1,450,939	20,317,285	1.302836%	1,687,582	20,395,526	1.274676%
Town of Bedford	4,185,942	55,208,123	3.540193%	4,470,165	54,291,514	3.393101%
Town of Billerica	11,555,045	150,770,372	9.668074%	11,921,516	157,213,941	9.825526%
Town of Boxborough	843,801	11,266,225	0.722441%	943,152	12,546,753	0.784145%
Town of Burlington	9,454,623	127,441,167	8.172102%	10,023,321	137,604,549	8.599982%
Town of Carlisle	932,452	11,157,139	0.715446%	991,823	11,101,958	0.693848%
Town of Chelmsford	8,579,114	110,995,199	7.117512%	9,272,242	114,671,152	7.166695%
Town of Dracut	4,835,041	65,601,775	4.206681%	5,348,633	68,887,607	4.305325%
Town of Dunstable	219,591	2,958,745	0.189728%	275,072	3,317,391	0.207330%
Town of Groton	2,081,699	23,290,688	1.493504%	1,973,053	25,513,416	1.594533%
Town of Holliston	2,183,620	27,349,059	1.753745%	2,332,595	26,676,612	1.667230%
Town of Hopkinton	2,105,634	25,369,330	1.626795%	2,341,404	26,084,382	1.630217%
Town of Hudson	5,347,292	69,719,052	4.470699%	5,804,347	69,381,303	4.336180%
Town of Lincoln	2,153,104	27,722,484	1.777690%	2,274,023	27,767,333	1.735398%
Town of Littleton	2,185,944	25,332,249	1.624418%	3,086,111	26,056,611	1.628481%
Town of North Reading	3,861,918	52,331,338	3.355721%	4,161,014	52,178,434	3.261038%
Town of Pepperell	1,346,506	17,953,081	1.151232%	1,455,491	18,312,861	1.144514%

¹ Net Pension Liability for each employer was determined on an individual basis.

The NPL for the Middlesex County Retirement Board, Middlesex County and the Middlesex Hospital has been allocated amongst the other units in the System in proportion to the remaining units' NPL because the obligation to fund these units is a shared responsibility of these other units.

Section 2: GASB Information

Employer Name	FY 2019 Total Contributions	Share of NPL as of January 1, 2019	Percent of Total NPL	FY 2020 Total Contributions	Share of NPL as of January 1, 2020 ¹	Percent of Total NPL
Town of Sherborn	975,181	11,725,506	0.751892%	1,018,037	10,450,215	0.653116%
Town of Shirley	801,553	9,113,056	0.584370%	785,020	9,325,501	0.582823%
Town of Stow	881,015	11,645,337	0.746751%	957,695	11,909,143	0.744295%
Town of Sudbury	4,468,265	63,931,576	4.099580%	5,026,152	64,186,721	4.011530%
Town of Tewksbury	7,972,598	104,461,551	6.698544%	8,553,198	107,519,124	6.719710%
Town of Townsend	812,598	9,256,011	0.593537%	854,966	8,637,189	0.539805%
Town of Tyngsborough	1,955,622	23,277,997	1.492690%	2,018,021	25,022,982	1.563882%
Town of Wayland	4,648,984	59,255,947	3.799758%	4,863,333	59,191,196	3.699320%
Town of Westford	4,902,690	59,376,424	3.807483%	5,154,547	59,489,841	3.717985%
Town of Weston	5,114,630	66,869,588	4.287979%	5,287,887	67,631,236	4.226804%
Town of Wilmington	7,037,178	90,145,064	5.780507%	8,088,259	91,654,915	5.728232%
Acton-Boxborough RSD	2,467,453	29,957,174	1.920989%	2,615,376	31,360,065	1.959935%
Acton Water Supply	218,063	3,740,627	0.239866%	243,164	3,732,674	0.233284%
Bedford Housing Authority	31,094	341,646	0.021908%	32,373	332,568	0.020785%
Billerica Housing Authority	107,677	1,441,037	0.092406%	107,339	1,647,762	0.102982%
Chelmsford Housing Authority	179,217	2,441,133	0.156536%	323,132	2,275,176	0.142194%
Chelmsford Water District	506,218	708,793	0.045451%	63,546	343,766	0.021485%
Dracut Housing Authority	131,218	2,173,260	0.139359%	150,496	2,317,408	0.144833%
Dracut Water Supply	173,855	3,288,228	0.210856%	229,578	3,356,809	0.209793%
E. Chelmsford Water	30,295	381,924	0.024491%	33,752	395,631	0.024726%
E. Middlesex Mosq Control	46,515	662,694	0.042495%	48,048	712,131	0.044507%
Greater Lowell RVTSD	1,252,691	16,800,249	1.077307%	1,215,091	18,372,432	1.148237%
Groton-Dunstable RSD	913,825	12,305,499	0.789084%	1,022,579	13,046,678	0.815389%

Section 2: GASB Information

Employer Name	FY 2019 Total Contributions	Share of NPL as of January 1, 2019	Percent of Total NPL	FY 2020 Total Contributions	Share of NPL as of January 1, 2020 ¹	Percent of Total NPL
Hudson Housing Authority	107,481	1,223,133	0.078433%	91,276	704,593	0.044036%
Lincoln Sudbury	646,913	9,231,680	0.591977%	704,071	9,126,061	0.570359%
Nashoba Vally THSD	271,217	3,632,610	0.232939%	302,392	3,735,397	0.233454%
N. Chelmsford Water	44,274	1,048,622	0.067242%	67,121	1,074,652	0.067163%
North Middlesex RSD	974,640	12,930,464	0.829159%	1,049,643	13,400,780	0.837519%
Shawsheen Valley RVS	662,826	8,565,024	0.549228%	675,105	8,870,284	0.554373%
South Middlesex RVTs	577,388	7,146,118	0.458241%	559,609	7,027,195	0.439184%
Sudbury Water District	128,447	2,025,843	0.129906%	131,864	2,571,703	0.160726%
Tewksbury Housing Authority	131,057	1,647,987	0.105676%	133,342	1,723,517	0.107716%
Wayland Housing Authority	45,169	719,713	0.046151%	51,279	675,758	0.042233%
Hopkinton Housing Authority	38,114	512,474	0.032862%	37,224	537,329	0.033582%
Sudbury Housing Authority	30,394	485,854	0.031155%	40,316	490,188	0.030636%
Wilmington Housing Authority	30,100	365,221	0.023420%	33,927	382,144	0.023883%
Acton Housing Authority	74,503	844,128	0.054129%	60,962	907,630	0.056725%
Burlington Housing Authority	6,786	145,929	0.009358%	13,577	345,712	0.021606%
Ayer Housing Authority	73,633	800,823	0.051352%	57,680	879,177	0.054947%
Holliston Housing Authority	19,726	158,430	0.010159%	14,815	175,571	0.010973%
Littleton Housing Authority	40,349	487,306	0.031248%	40,463	621,840	0.038864%
Westford Housing Authority	46,011	561,187	0.035986%	47,397	570,710	0.035668%
Shirley Water District	21,013	406,103	0.026041%	22,677	484,781	0.030298%
Tyngsboro Housing Authority	39,858	526,614	0.033769%	41,548	528,855	0.033052%
Pepperell Housing Authority	14,362	187,001	0.011991%	17,159	251,415	0.015713%
Groton Housing Authority	3,223	-9,522	-0.000611%	2,809	0	0.000000%

Section 2: GASB Information

Employer Name	FY 2019 Total Contributions	Share of NPL as of January 1, 2019	Percent of Total NPL	FY 2020 Total Contributions	Share of NPL as of January 1, 2020 ¹	Percent of Total NPL
Tyngsboro Water District	33,753	463,086	0.029695%	37,652	481,728	0.030107%
North Reading Housing Authority	16,393	159,024	0.010197%	16,668	214,226	0.013389%
West Groton Water	1039	39,007	0.002501%	2,545	36,784	0.002299%
Ayer-Shirley RSD	446,008	5,157,881	0.330747%	467,540	4,713,693	0.294595%
Grand Totals:	\$120,614,676	\$1,559,466,457	100.000000%	\$129,685,754	\$1,600,056,015	100.000000%

Section 2: GASB Information

Exhibit 6 – Determination of Proportionate Share Amounts by Employer

Employer Name	2020 Share of Cost Allocation (1)	Net Pension Liability (2)	Covered Employee Payroll (3)	Discount Rate Sensitivity		
				1% Decrease (6.30%) (4)	Current Discount Rate (7.30%) (5)	1% Increase (8.30%) (6)
Middlesex County Retirement Board	0.000000%	\$0	\$1,345,329	\$0	\$0	\$0
Middlesex County	0.000000%	0	0	0	0	0
Middlesex Hospital	0.000000%	0	0	0	0	0
Town of Acton	3.435292%	54,966,604	14,564,884	67,549,603	54,966,604	44,378,333
Town of Ashby	0.121321%	1,941,210	1,113,135	2,385,593	1,941,210	1,567,273
Town of Ashland	2.356416%	37,703,972	14,500,500	46,335,195	37,703,972	30,441,019
Town of Ayer	1.274676%	20,395,526	7,236,067	25,064,486	20,395,526	16,466,716
Town of Bedford	3.393101%	54,291,514	19,611,792	66,719,971	54,291,514	43,833,287
Town of Billerica	9.825526%	157,213,941	37,001,063	193,203,481	157,213,941	126,929,664
Town of Boxborough	0.784145%	12,546,753	3,393,712	15,418,966	12,546,753	10,129,860
Town of Burlington	8.59982%	137,604,549	35,400,619	169,105,092	137,604,549	111,097,650
Town of Carlisle	0.693848%	11,101,958	5,787,456	13,643,427	11,101,958	8,963,377
Town of Chelmsford	7.166695%	114,671,152	27,918,845	140,921,763	114,671,152	92,581,936
Town of Dracut	4.305325%	68,887,607	16,709,878	84,657,413	68,887,607	55,617,720
Town of Dunstable	0.207330%	3,317,391	1,444,438	4,076,811	3,317,391	2,678,359
Town of Groton	1.594533%	25,513,416	7,971,673	31,353,967	25,513,416	20,598,742
Town of Holliston	1.667230%	26,676,612	11,384,973	32,783,443	26,676,612	21,537,870
Town of Hopkinton	1.630217%	26,084,382	16,296,923	32,055,639	26,084,382	21,059,722
Town of Hudson	4.336180%	69,381,303	21,683,348	85,264,126	69,381,303	56,016,315
Town of Lincoln	1.735398%	27,767,333	10,549,034	34,123,853	27,767,333	22,418,485
Town of Littleton	1.628481%	26,056,611	13,118,371	32,021,511	26,056,611	21,037,301
Town of North Reading	3.261038%	52,178,434	13,756,949	64,123,163	52,178,434	42,127,251
Town of Pepperell	1.144514%	18,312,861	4,853,532	22,505,056	18,312,861	14,785,237

Section 2: GASB Information

Employer Name	2020 Share of Cost Allocation (1)	Net Pension Liability (2)	Covered Employee Payroll (3)	Discount Rate Sensitivity		
				1% Decrease (6.30%) (4)	Current Discount Rate (7.30%) (5)	1% Increase (8.30%) (6)
Town of Sherborn	0.653116%	10,450,215	4,382,868	12,842,487	10,450,215	8,437,180
Town of Shirley	0.582823%	9,325,501	2,007,108	11,460,302	9,325,501	7,529,121
Town of Stow	0.744295%	11,909,143	3,539,435	14,635,393	11,909,143	9,615,073
Town of Sudbury	4.011530%	64,186,721	17,867,775	78,880,396	64,186,721	51,822,370
Town of Tewksbury	6.719710%	107,519,124	23,249,584	132,132,487	107,519,124	86,807,610
Town of Townsend	0.539805%	8,637,189	3,570,490	10,614,421	8,637,189	6,973,399
Town of Tyngsborough	1.563882%	25,022,982	8,730,626	30,751,263	25,022,982	20,202,781
Town of Wayland	3.699320%	59,191,196	20,058,574	72,741,292	59,191,196	47,789,138
Town of Westford	3.717985%	59,489,841	25,881,068	73,108,303	59,489,841	48,030,255
Town of Weston	4.226804%	67,631,236	20,581,451	83,113,432	67,631,236	54,603,365
Town of Wilmington	5.728232%	91,654,915	23,538,426	112,636,631	91,654,915	73,999,339
Acton-Boxborough RSD	1.959935%	31,360,065	14,855,796	38,539,036	31,360,065	25,319,145
Acton Water Supply	0.233284%	3,732,674	1,225,561	4,587,161	3,732,674	3,013,645
Bedford Housing Authority	0.020785%	332,568	168,089	408,700	332,568	268,505
Billerica Housing Authority	0.102982%	1,647,762	398,705	2,024,969	1,647,762	1,330,352
Chelmsford Housing Authority	0.142194%	2,275,176	2,612,882	2,796,011	2,275,176	1,836,907
Chelmsford Water District	0.021485%	343,766	1,405,409	422,461	343,766	277,546
Dracut Housing Authority	0.144833%	2,317,408	409,209	2,847,911	2,317,408	1,871,003
Dracut Water Supply	0.209793%	3,356,809	709,022	4,125,252	3,356,809	2,710,184
E. Chelmsford Water	0.024726%	395,631	215,299	486,199	395,631	319,420
E. Middlesex Mosq Control	0.044507%	712,131	363,040	875,153	712,131	574,953
Greater Lowell RVTSD	1.148237%	18,372,432	4,300,319	22,578,264	18,372,432	14,833,333
Groton-Dunstable RSD	0.815389%	13,046,678	3,898,859	16,033,334	13,046,678	10,533,484

Section 2: GASB Information

Employer Name	2020 Share of Cost Allocation (1)	Net Pension Liability (2)	Covered Employee Payroll (3)	Discount Rate Sensitivity		
				1% Decrease (6.30%) (4)	Current Discount Rate (7.30%) (5)	1% Increase (8.30%) (6)
Hudson Housing Authority	0.044036%	704,593	357,369	865,889	704,593	568,867
Lincoln Sudbury	0.570359%	9,126,061	2,887,889	11,215,206	9,126,061	7,368,099
Nashoba Vally THSD	0.233454%	3,735,397	951,899	4,590,507	3,735,397	3,015,844
N. Chelmsford Water	0.067163%	1,074,652	641,852	1,320,662	1,074,652	867,641
North Middlesex RSD	0.837519%	13,400,780	5,281,936	16,468,497	13,400,780	10,819,375
Shawsheen Valley RVS	0.554373%	8,870,284	2,634,703	10,900,876	8,870,284	7,161,593
South Middlesex RVTS	0.439184%	7,027,195	2,173,995	8,635,866	7,027,195	5,673,540
Sudbury Water District	0.160726%	2,571,703	1,031,163	3,160,419	2,571,703	2,076,313
Tewksbury Housing Authority	0.107716%	1,723,517	401,435	2,118,066	1,723,517	1,391,514
Wayland Housing Authority	0.042233%	675,758	305,259	830,453	675,758	545,586
Hopkinton Housing Authority	0.033582%	537,329	76,603	660,335	537,329	433,823
Sudbury Housing Authority	0.030636%	490,188	101,882	602,402	490,188	395,763
Wilmington Housing Authority	0.023883%	382,144	139,797	469,625	382,144	308,531
Acton Housing Authority	0.056725%	907,630	397,270	1,115,405	907,630	732,792
Burlington Housing Authority	0.021606%	345,712	207,760	424,853	345,712	279,117
Ayer Housing Authority	0.054947%	879,177	116,945	1,080,439	879,177	709,820
Holliston Housing Authority	0.010973%	175,571	81,096	215,763	175,571	141,751
Littleton Housing Authority	0.038864%	621,840	39,232	764,192	621,840	502,054
Westford Housing Authority	0.035668%	570,710	226,753	701,357	570,710	460,774
Shirley Water District	0.030298%	484,781	216,890	595,757	484,781	391,397
Tyngsboro Housing Authority	0.033052%	528,855	175,579	649,921	528,855	426,981
Pepperell Housing Authority	0.015713%	251,415	103,476	308,969	251,415	202,985
Groton Housing Authority	0.000000%	0	0	0	0	0

Section 2: GASB Information

Employer Name	2020 Share of Cost Allocation (1)	Net Pension Liability (2)	Covered Employee Payroll (3)	Discount Rate Sensitivity		
				1% Decrease (6.30%) (4)	Current Discount Rate (7.30%) (5)	1% Increase (8.30%) (6)
Tyngsboro Water District	0.030107%	481,728	205,062	592,006	481,728	388,932
North Reading Housing Authority	0.013389%	214,226	90,640	263,267	214,226	172,959
West Groton Water	0.002299%	36,784	124,349	45,205	36,784	29,698
Ayer-Shirley RSD	<u>0.294595%</u>	<u>4,713,693</u>	<u>3,526,825</u>	<u>5,792,755</u>	<u>4,713,693</u>	<u>3,805,690</u>
Grand Totals:	100.000000%	\$1,600,056,015	\$492,109,775	\$1,966,342,109	\$1,600,056,015	\$1,291,835,664

Section 2: GASB Information

Employer Name	Schedule of Contributions				Pension Expense		
	Statutory Required Contribution (7)	Contributions In Relation to the Statutory Required Contribution (8)	Contribution Deficiency/ (Excess) (9)	Contributions as a Percentage of Covered Employee Payroll (10)	Proportionate Share of Plan Pension Expense (11)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (12)	Total Employer Pension Expense (13)
Middlesex County Retirement Board	\$351,211	\$351,211	\$0	26.11%	\$351,211	\$0	\$351,211
Middlesex County	0	0	0	0.00%	0	0	0
Middlesex Hospital	0	0	0	0.00%	0	0	0
Town of Acton	4,229,480	4,236,342	-6,862	29.09%	7,905,662	-182,196	7,723,466
Town of Ashby	237,579	237,579	0	21.34%	279,198	41,072	320,270
Town of Ashland	3,054,672	3,086,828	-32,156	21.29%	5,422,836	912,073	6,334,909
Town of Ayer	1,687,582	1,687,582	0	23.32%	2,933,420	-90,868	2,842,552
Town of Bedford	4,469,908	4,470,165	-257	22.79%	7,808,566	-762,275	7,046,291
Town of Billerica	11,921,516	11,921,516	0	32.22%	22,611,554	-994,232	21,617,322
Town of Boxborough	943,152	943,152	0	27.79%	1,804,557	407,179	2,211,736
Town of Burlington	10,023,321	10,023,321	0	28.31%	19,791,200	710,892	20,502,092
Town of Carlisle	991,823	991,823	0	17.14%	1,596,757	154,825	1,751,582
Town of Chelmsford	8,872,242	9,272,242	-400,000	33.21%	16,492,767	-494,359	15,998,408
Town of Dracut	5,348,633	5,348,633	0	32.01%	9,907,873	458,180	10,366,053
Town of Dunstable	274,244	275,072	-828	19.04%	477,129	89,762	566,891
Town of Groton	1,973,053	1,973,053	0	24.75%	3,669,509	101,671	3,771,180
Town of Holliston	2,250,407	2,332,595	-82,188	20.49%	3,836,808	-112,665	3,724,143
Town of Hopkinton	2,335,018	2,341,404	-6,386	14.37%	3,751,629	815,351	4,566,980
Town of Hudson	5,798,334	5,804,347	-6,013	26.77%	9,978,880	-164,006	9,814,874
Town of Lincoln	2,274,023	2,274,023	0	21.56%	3,993,682	-193,556	3,800,126
Town of Littleton	2,206,947	3,086,111	-879,164	23.53%	3,747,635	894,826	4,642,461
Town of North Reading	4,161,014	4,161,014	0	30.25%	7,504,649	-626,051	6,878,598
Town of Pepperell	1,454,092	1,455,491	-1,399	29.99%	2,633,877	381,916	3,015,793

Section 2: GASB Information

Employer Name	Schedule of Contributions				Pension Expense		
	Statutory Required Contribution (7)	Contributions In Relation to the Statutory Required Contribution (8)	Contribution Deficiency/ (Excess) (9)	Contributions as a Percentage of Covered Employee Payroll (10)	Proportionate Share of Plan Pension Expense (11)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (12)	Total Employer Pension Expense (13)
Town of Sherborn	1,018,037	1,018,037	0	23.23%	1,503,019	-281,130	1,221,889
Town of Shirley	785,020	785,020	0	39.11%	1,341,255	-262,490	1,078,765
Town of Stow	957,695	957,695	0	27.06%	1,712,852	67,332	1,780,184
Town of Sudbury	5,026,152	5,026,152	0	28.13%	9,231,760	-466,047	8,765,713
Town of Tewksbury	8,545,236	8,553,198	-7,962	36.79%	15,464,115	-206,362	15,257,753
Town of Townsend	854,966	854,966	0	23.95%	1,242,258	12,400	1,254,658
Town of Tyngsborough	2,014,919	2,018,021	-3,102	23.11%	3,598,971	543,314	4,142,285
Town of Wayland	4,862,852	4,863,333	-481	24.25%	8,513,271	-1,024,927	7,488,344
Town of Westford	5,152,765	5,154,547	-1,782	19.92%	8,556,224	666,523	9,222,747
Town of Weston	5,287,887	5,287,887	0	25.69%	9,727,174	-1,066,471	8,660,703
Town of Wilmington	7,080,174	8,088,259	-1,008,085	34.36%	13,182,419	-78,802	13,103,617
Acton-Boxborough RSD	2,615,376	2,615,376	0	17.61%	4,510,412	477,364	4,987,776
Acton Water Supply	243,164	243,164	0	19.84%	536,858	-16,668	520,190
Bedford Housing Authority	32,373	32,373	0	19.26%	47,832	5,659	53,491
Billerica Housing Authority	107,339	107,339	0	26.92%	236,992	38,724	275,716
Chelmsford Housing Authority	225,881	323,132	-97,251	12.37%	327,231	182,612	509,843
Chelmsford Water District	63,546	63,546	0	4.52%	49,443	167,292	216,735
Dracut Housing Authority	150,496	150,496	0	36.78%	333,305	-26,568	306,737
Dracut Water Supply	229,578	229,578	0	32.38%	482,798	-6,444	476,354
E. Chelmsford Water	33,752	33,752	0	15.68%	56,902	11,848	68,750
E. Middlesex Mosq Control	48,048	48,048	0	13.23%	102,424	24,319	126,743
Greater Lowell RVTSD	1,215,091	1,215,091	0	28.26%	2,642,445	-76,009	2,566,436
Groton-Dunstable RSD	1,022,579	1,022,579	0	26.23%	1,876,460	455,059	2,331,519

Section 2: GASB Information

Employer Name	Schedule of Contributions				Pension Expense		
	Statutory Required Contribution (7)	Contributions In Relation to the Statutory Required Contribution (8)	Contribution Deficiency/ (Excess) (9)	Contributions as a Percentage of Covered Employee Payroll (10)	Proportionate Share of Plan Pension Expense (11)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (12)	Total Employer Pension Expense (13)
Hudson Housing Authority	91,276	91,276	0	25.54%	101,339	-172,625	-71,286
Lincoln Sudbury	704,071	704,071	0	24.38%	1,312,571	-177,488	1,135,083
Nashoba Vally THSD	302,392	302,392	0	31.77%	537,250	-62,505	474,745
N. Chelmsford Water	67,121	67,121	0	10.46%	154,563	17,185	171,748
North Middlesex RSD	1,049,643	1,049,643	0	19.87%	1,927,390	-24,317	1,903,073
Shawsheen Valley RVS	675,105	675,105	0	25.62%	1,275,783	-99,530	1,176,253
South Middlesex RVTS	559,609	559,609	0	25.74%	1,010,698	-167,189	843,509
Sudbury Water District	131,864	131,864	0	12.79%	369,880	89,496	459,376
Tewksbury Housing Authority	133,342	133,342	0	33.22%	247,888	24,550	272,438
Wayland Housing Authority	51,279	51,279	0	16.80%	97,192	15,708	112,900
Hopkinton Housing Authority	37,224	37,224	0	48.59%	77,282	-1,903	75,379
Sudbury Housing Authority	40,316	40,316	0	39.57%	70,502	25,889	96,391
Wilmington Housing Authority	33,927	33,927	0	24.27%	54,962	8,995	63,957
Acton Housing Authority	60,962	60,962	0	15.35%	130,542	-14,727	115,815
Burlington Housing Authority	13,577	13,577	0	6.53%	49,722	46,272	95,994
Ayer Housing Authority	57,680	57,680	0	49.32%	126,449	25,163	151,612
Holliston Housing Authority	14,815	14,815	0	18.27%	25,251	-7,002	18,249
Littleton Housing Authority	40,463	40,463	0	103.14%	89,438	23,698	113,136
Westford Housing Authority	47,397	47,397	0	20.90%	82,084	10,228	92,312
Shirley Water District	22,677	22,677	0	10.46%	69,725	700	70,425
Tyngsboro Housing Authority	41,548	41,548	0	23.66%	76,064	965	77,029
Pepperell Housing Authority	17,159	17,159	0	16.58%	36,160	20,305	56,465
Groton Housing Authority	2,809	2,809	0	0.00%	0	1,191	1,191

Section 2: GASB Information

Employer Name	Schedule of Contributions				Pension Expense		
	Statutory Required Contribution (7)	Contributions In Relation to the Statutory Required Contribution (8)	Contribution Deficiency/ (Excess) (9)	Contributions as a Percentage of Covered Employee Payroll (10)	Proportionate Share of Plan Pension Expense (11)	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (12)	Total Employer Pension Expense (13)
Tyngsboro Water District	37,652	37,652	0	18.36%	69,285	6,883	76,168
North Reading Housing Authority	16,668	16,668	0	18.39%	30,811	20,609	51,420
West Groton Water	2,545	2,545	0	2.05%	5,291	4,688	9,979
Ayer-Shirley RSD	<u>467,540</u>	<u>467,540</u>	<u>0</u>	<u>13.26%</u>	<u>677,954</u>	<u>-103,306</u>	<u>574,648</u>
Grand Totals:	\$127,151,838	\$129,685,754	-\$2,533,916	26.35%	\$230,481,895	\$0	\$230,481,895

Section 2: GASB Information

Employer Name	Deferred Outflows of Resources				Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Changes of Assumptions (15)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (16)	Total Deferred Outflows of Resources (17)	Differences Between Expected and Actual Experience (18)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (19)	Changes of Assumptions (20)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (21)	Total Deferred Inflows of Resources (22)
Middlesex County Retirement Board	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Middlesex County	0	0	0	0	0	0	0	0	0
Middlesex Hospital	0	0	0	0	0	0	0	0	0
Town of Acton	1,337,455	3,785,335	1,201,177	6,323,967	124,487	1,426,379	0	1,136,670	2,687,536
Town of Ashby	47,234	133,684	331,267	512,185	4,396	50,374	0	275,943	330,713
Town of Ashland	917,418	2,596,525	1,487,824	5,001,767	85,391	978,415	0	0	1,063,806
Town of Ayer	496,267	1,404,560	672,369	2,573,196	46,191	529,262	0	721,875	1,297,328
Town of Bedford	1,321,029	3,738,844	390,107	5,449,980	122,958	1,408,861	0	2,281,555	3,813,374
Town of Billerica	3,825,352	10,826,707	2,472,890	17,124,947	356,055	4,079,690	0	4,147,868	8,583,617
Town of Boxborough	305,289	864,046	1,000,048	2,169,383	28,415	325,587	0	102,818	456,820
Town of Burlington	3,348,213	9,476,287	5,600,583	18,425,083	311,644	3,570,828	0	2,188,101	6,070,571
Town of Carlisle	270,134	764,548	613,663	1,648,345	25,143	288,095	0	445,502	758,740
Town of Chelmsford	2,790,195	7,896,954	1,872,541	12,559,690	259,704	2,975,708	0	2,182,213	5,417,625
Town of Dracut	1,676,183	4,744,020	1,940,809	8,361,012	156,014	1,787,630	0	708,170	2,651,812
Town of Dunstable	80,719	228,456	416,355	725,530	7,513	86,086	0	78,903	172,502
Town of Groton	620,794	1,757,009	1,421,500	3,799,305	57,782	662,071	0	599,117	1,318,970
Town of Holliston	649,099	1,837,114	940,604	3,426,817	60,416	692,256	0	1,390,777	2,143,449
Town of Hopkinton	634,689	1,796,329	1,846,714	4,277,732	59,075	676,888	0	270,816	1,006,779
Town of Hudson	1,688,196	4,778,019	547,946	7,014,161	157,133	1,800,440	0	1,589,249	3,546,822
Town of Lincoln	675,639	1,912,228	250,027	2,837,894	62,887	720,560	0	821,479	1,604,926
Town of Littleton	634,013	1,794,417	2,836,447	5,264,877	59,012	676,167	0	921,507	1,656,686
Town of North Reading	1,269,613	3,593,325	167,040	5,029,978	118,172	1,354,026	0	1,731,036	3,203,234
Town of Pepperell	445,591	1,261,135	446,020	2,152,746	41,474	475,217	0	261,895	778,586

Section 2: GASB Information

Employer Name	Deferred Outflows of Resources				Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Changes of Assumptions (15)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (16)	Total Deferred Outflows of Resources (17)	Differences Between Expected and Actual Experience (18)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (19)	Changes of Assumptions (20)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (21)	Total Deferred Inflows of Resources (22)
Town of Sherborn	254,276	719,665	317,310	1,291,251	23,667	271,182	0	1,286,104	1,580,953
Town of Shirley	226,909	642,211	130,529	999,649	21,120	241,996	0	461,149	724,265
Town of Stow	289,775	820,136	138,173	1,248,084	26,971	309,041	0	76,929	412,941
Town of Sudbury	1,561,800	4,420,288	829,093	6,811,181	145,368	1,665,641	0	2,111,917	3,922,926
Town of Tewksbury	2,616,171	7,404,421	1,803,116	11,823,708	243,506	2,790,113	0	2,027,650	5,061,269
Town of Townsend	210,161	594,809	580,163	1,385,133	19,561	224,134	0	992,365	1,236,060
Town of Tyngsborough	608,863	1,723,235	1,624,260	3,956,358	56,671	649,344	0	717,689	1,423,704
Town of Wayland	1,440,249	4,076,266	253,730	5,770,245	134,054	1,536,007	0	2,297,638	3,967,699
Town of Westford	1,447,515	4,096,833	2,155,101	7,699,449	134,731	1,543,757	0	1,463,064	3,141,552
Town of Weston	1,645,613	4,657,499	0	6,303,112	153,169	1,755,025	0	2,209,404	4,117,598
Town of Wilmington	2,230,160	6,311,915	1,233,552	9,775,627	207,577	2,378,438	0	1,359,953	3,945,968
Acton-Boxborough RSD	763,058	2,159,645	1,024,054	3,946,757	71,023	813,791	0	141,912	1,026,726
Acton Water Supply	90,824	257,055	80,339	428,218	8,454	96,863	0	205,041	310,358
Bedford Housing Authority	8,092	22,903	13,638	44,633	753	8,630	0	13,959	23,342
Billerica Housing Authority	40,094	113,475	152,286	305,855	3,732	42,759	0	55,943	102,434
Chelmsford Housing Authority	55,360	156,682	532,561	744,603	5,153	59,041	0	175,437	239,631
Chelmsford Water District	8,365	23,674	794,334	826,373	779	8,921	0	611,103	620,803
Dracut Housing Authority	56,387	159,591	114,604	330,582	5,248	60,137	0	127,540	192,925
Dracut Water Supply	81,678	231,170	171,415	484,263	7,602	87,109	0	175,593	270,304
E. Chelmsford Water	9,627	27,246	24,255	61,128	896	10,267	0	1,818	12,981
E. Middlesex Mosq Control	17,328	49,042	82,980	149,350	1,613	18,480	0	39,158	59,251
Greater Lowell RVTSD	447,041	1,265,238	1,039,315	2,751,594	41,609	476,763	0	682,815	1,201,187
Groton-Dunstable RSD	317,454	898,474	862,403	2,078,331	29,548	338,560	0	55,874	423,982

Section 2: GASB Information

Employer Name	Deferred Outflows of Resources				Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Changes of Assumptions (15)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (16)	Total Deferred Outflows of Resources (17)	Differences Between Expected and Actual Experience (18)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (19)	Changes of Assumptions (20)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (21)	Total Deferred Inflows of Resources (22)
Hudson Housing Authority	17,144	48,523	38,077	103,744	1,596	18,284	0	528,413	548,293
Lincoln Sudbury	222,057	628,476	102,068	952,601	20,668	236,821	0	472,168	729,657
Nashoba Vally THSD	90,890	257,242	97,183	445,315	8,460	96,933	0	170,076	275,469
N. Chelmsford Water	26,149	74,007	116,449	216,605	2,434	27,887	0	70,684	101,005
North Middlesex RSD	326,070	922,859	181,918	1,430,847	30,350	347,749	0	169,223	547,322
Shawsheen Valley RVS	215,833	610,862	122,522	949,217	20,089	230,183	0	331,874	582,146
South Middlesex RVTS	170,987	483,935	54,348	709,270	15,915	182,355	0	509,543	707,813
Sudbury Water District	62,575	177,103	495,141	734,819	5,824	66,735	0	206,918	279,477
Tewksbury Housing Authority	41,937	118,692	57,310	217,939	3,903	44,725	0	22,026	70,654
Wayland Housing Authority	16,443	46,537	45,269	108,249	1,530	17,536	0	58,226	77,292
Hopkinton Housing Authority	13,074	37,004	17,420	67,498	1,217	13,944	0	28,290	43,451
Sudbury Housing Authority	11,927	33,757	41,148	86,832	1,110	12,720	0	13,498	27,328
Wilmington Housing Authority	9,298	26,317	18,834	54,449	865	9,917	0	1,861	12,643
Acton Housing Authority	22,085	62,505	67,286	151,876	2,056	23,553	0	100,981	126,590
Burlington Housing Authority	8,412	23,808	183,310	215,530	783	8,971	0	27,524	37,278
Ayer Housing Authority	21,392	60,545	292,180	374,117	1,991	22,815	0	460,826	485,632
Holliston Housing Authority	4,272	12,091	18,703	35,066	398	4,556	0	31,815	36,769
Littleton Housing Authority	15,131	42,824	99,236	157,191	1,408	16,137	0	20,675	38,220
Westford Housing Authority	13,887	39,303	19,196	72,386	1,293	14,810	0	7,543	23,646
Shirley Water District	11,796	33,385	66,680	111,861	1,098	12,580	0	38,910	52,588
Tyngsboro Housing Authority	12,868	36,420	17,436	66,724	1,198	13,724	0	20,240	35,162
Pepperell Housing Authority	6,117	17,314	55,577	79,008	569	6,524	0	6,073	13,166
Groton Housing Authority	0	0	17,077	17,077	0	0	0	10,287	10,287

Section 2: GASB Information

Employer Name	Deferred Outflows of Resources				Deferred Inflows of Resources				
	Differences Between Expected and Actual Experience (14)	Changes of Assumptions (15)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (16)	Total Deferred Outflows of Resources (17)	Differences Between Expected and Actual Experience (18)	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments (19)	Changes of Assumptions (20)	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions (21)	Total Deferred Inflows of Resources (22)
Tyngsboro Water District	11,721	33,175	27,904	72,800	1,091	12,501	0	12,123	25,715
North Reading Housing Authority	5,213	14,753	51,883	71,849	485	5,559	0	3,204	9,248
West Groton Water	895	2,533	11,782	15,210	83	955	0	6,560	7,598
Ayer-Shirley RSD	<u>114,694</u>	<u>324,614</u>	<u>434,072</u>	<u>873,380</u>	<u>10,675</u>	<u>122,320</u>	<u>0</u>	<u>688,041</u>	<u>821,036</u>
Grand Totals:	\$38,932,789	\$110,189,599	\$43,163,151	\$192,285,539	\$3,623,756	\$41,521,333	\$0	\$43,163,151	\$88,308,240

Section 2: GASB Information

Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30)

Employer Name	2021 (23)	2022 (24)	2023 (25)	2024 (26)	Thereafter (27)
Middlesex County Retirement Board	\$0	\$0	\$0	\$0	\$0
Middlesex County	0	0	0	0	0
Middlesex Hospital	0	0	0	0	0
Town of Acton	1,492,083	1,213,723	934,713	-4,088	0
Town of Ashby	78,474	102,402	34,026	-33,430	0
Town of Ashland	1,925,048	977,590	907,208	128,115	0
Town of Ayer	504,435	477,440	352,715	-58,722	0
Town of Bedford	921,444	432,124	645,057	-362,019	0
Town of Billerica	4,273,499	1,465,619	2,427,112	375,106	0
Town of Boxborough	775,140	395,572	376,445	165,406	0
Town of Burlington	5,117,452	3,145,891	3,035,635	1,055,532	0
Town of Carlisle	416,985	207,138	300,298	-34,816	0
Town of Chelmsford	3,340,143	2,014,750	1,581,451	205,721	0
Town of Dracut	2,579,458	1,547,431	1,310,223	272,086	0
Town of Dunstable	178,781	191,209	130,573	52,465	0
Town of Groton	921,879	552,548	726,736	279,170	0
Town of Holliston	583,903	408,547	481,307	-190,389	0
Town of Hopkinton	1,308,351	896,684	994,351	71,567	0
Town of Hudson	1,913,022	929,986	919,447	-295,116	0
Town of Lincoln	605,959	276,095	446,601	-95,687	0
Town of Littleton	1,494,286	881,183	1,009,987	222,735	0
Town of North Reading	1,061,788	488,305	521,335	-244,684	0
Town of Pepperell	889,463	210,603	286,963	-12,869	0

Section 2: GASB Information

Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30)

Employer Name	2021 (23)	2022 (24)	2023 (25)	2024 (26)	Thereafter (27)
Town of Sherborn	16,233	-58,114	-13,027	-234,794	0
Town of Shirley	32,089	72,978	162,871	7,446	0
Town of Stow	420,012	194,011	221,915	-795	0
Town of Sudbury	1,633,379	858,571	636,481	-240,176	0
Town of Tewksbury	3,426,677	1,902,851	1,337,797	95,114	0
Town of Townsend	219,985	-71,213	113,772	-113,471	0
Town of Tyngsborough	1,223,434	377,685	718,993	212,542	0
Town of Wayland	791,218	416,360	824,469	-229,501	0
Town of Westford	2,209,540	1,137,700	1,356,041	-145,384	0
Town of Weston	1,125,437	361,300	865,255	-166,478	0
Town of Wilmington	2,923,985	1,517,309	1,344,099	44,266	0
Acton-Boxborough RSD	1,390,012	651,181	735,506	143,332	0
Acton Water Supply	101,838	16,801	27,092	-27,871	0
Bedford Housing Authority	14,254	4,644	4,232	-1,839	0
Billerica Housing Authority	92,751	41,997	43,355	25,318	0
Chelmsford Housing Authority	239,790	214,569	61,449	-10,836	0
Chelmsford Water District	121,793	59,342	83,960	-59,525	0
Dracut Housing Authority	60,299	41,580	26,498	9,280	0
Dracut Water Supply	110,802	88,688	23,801	-9,332	0
E. Chelmsford Water	20,236	12,920	13,745	1,246	0
E. Middlesex Mosq Control	34,916	18,356	32,694	4,133	0
Greater Lowell RVTSD	529,355	471,779	394,468	154,805	0
Groton-Dunstable RSD	780,455	421,681	377,490	74,723	0

Section 2: GASB Information

Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30)

Employer Name	2021 (23)	2022 (24)	2023 (25)	2024 (26)	Thereafter (27)
Hudson Housing Authority	-141,926	-131,773	-82,144	-88,706	0
Lincoln Sudbury	127,381	90,538	66,673	-61,648	0
Nashoba Vally THSD	79,023	60,952	26,134	3,737	0
N. Chelmsford Water	39,668	46,119	33,345	-3,532	0
North Middlesex RSD	364,820	219,414	274,748	24,543	0
Shawsheen Valley RVS	199,393	22,833	133,618	11,227	0
South Middlesex RVTS	50,982	-73,506	74,686	-50,705	0
Sudbury Water District	171,579	74,930	136,509	72,324	0
Tewksbury Housing Authority	78,520	33,170	30,077	5,518	0
Wayland Housing Authority	31,729	4,163	6,267	-11,202	0
Hopkinton Housing Authority	11,386	205	11,371	1,085	0
Sudbury Housing Authority	36,595	17,090	6,841	-1,022	0
Wilmington Housing Authority	20,352	11,005	8,321	2,128	0
Acton Housing Authority	9,444	-16,833	27,376	5,299	0
Burlington Housing Authority	45,067	51,050	50,623	31,512	0
Ayer Housing Authority	52,402	-184,962	13,172	7,873	0
Holliston Housing Authority	-4,852	-6,628	7,278	2,499	0
Littleton Housing Authority	45,047	27,672	26,592	19,660	0
Westford Housing Authority	25,363	15,156	8,517	-296	0
Shirley Water District	14,363	14,704	21,343	8,863	0
Tyngsboro Housing Authority	20,161	9,721	3,608	-1,928	0
Pepperell Housing Authority	27,190	15,541	13,210	9,901	0
Groton Housing Authority	292	-27	4,259	2,266	0

Section 2: GASB Information

Employer Name	Deferred Inflows/(Outflows) Recognized In Future Pension Expense (Year Ended June 30)				
	2021 (23)	2022 (24)	2023 (25)	2024 (26)	Thereafter (27)
Tyngsboro Water District	17,861	11,502	16,545	1,177	0
North Reading Housing Authority	26,004	13,469	14,224	8,904	0
West Groton Water	2,580	3,523	2,138	-629	0
Ayer-Shirley RSD	<u>3,222</u>	<u>25,570</u>	<u>104,340</u>	<u>-80,788</u>	<u>0</u>
Grand Totals:	\$49,253,729	\$25,922,414	\$27,854,810	\$946,346	\$0

Appendix – Glossary of Terms

Definitions of certain terms as they are used in Statement 68. The terms may have different meanings in other contexts.

Active Employees:	Individuals employed at the end of the reporting or measurement period, as applicable.
Actual Contributions:	Cash contributions recognized as additions to a pension Plan Fiduciary Net Position.
Actuarial Present Value of Projected Benefit Payments:	Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.
Actuarial Valuation:	The determination, as of a point in time (the actuarial valuation date), of the service cost, Total Pension Liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice unless otherwise specified by the GASB.
Actuarial Valuation Date:	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution:	A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.
Ad Hoc Cost-of-Living Adjustments (Ad Hoc COLAs):	Cost-of-living adjustments that require a decision to grant by the authority responsible for making such decisions.
Ad Hoc Postemployment Benefit Changes:	Postemployment benefit changes that require a decision to grant by the authority responsible for making such decisions.
Agent Employer:	An employer whose employees are provided with pensions through an agent multiple-employer defined benefit pension plan.
Agent Multiple-Employer Defined Benefit Pension Plan (Agent Pension Plan):	A multiple-employer defined benefit pension plan in which pension plan assets are pooled for investment purposes but separate accounts are maintained for each individual employer so that each employer's share of the pooled assets is legally available to pay the benefits of only its employees.
Allocated Insurance Contract:	A contract with an insurance company under which related payments to the insurance company are currently used to purchase immediate or deferred annuities for individual employees. Also may be referred to as an annuity contract.
Automatic Cost-of-Living Adjustments (Automatic COLAs):	Cost-of-living adjustments that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).
Automatic Postemployment Benefit Changes:	Postemployment benefit changes that occur without a requirement for a decision to grant by a responsible authority, including those for which the amounts are determined by reference to a specified experience factor (such as the earnings experience of the pension plan) or to another variable (such as an increase in the consumer price index).

Appendix – Glossary of Terms

Closed Period:	A specific number of years that is counted from one date and declines to zero with the passage of time. For example, if the recognition period initially is five years on a closed basis, four years remain after the first year, three years after the second year, and so forth.
Collective Deferred Outflows of Resources and Deferred Inflows of Resources Related to Pensions:	Deferred outflows of resources and deferred inflows of resources related to pensions arising from certain changes in the collective Net Pension Liability.
Collective Net Pension Liability:	The Net Pension Liability for benefits provided through (1) a cost-sharing pension plan or (2) a single-employer or agent pension plan in circumstances in which there is a special funding situation.
Collective Pension Expense:	Pension expense arising from certain changes in the collective Net Pension Liability.
Contributions:	Additions to a pension Plan Fiduciary Net Position for amounts from employers, non-employer contributing entities (for example, state government contributions to a local government pension plan), or employees. Contributions can result from cash receipts by the pension plan or from recognition by the pension plan of a receivable from one of these sources.
Cost-of-Living Adjustments:	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Employer:	An employer whose employees are provided with pensions through a cost-sharing multiple-employer defined benefit pension plan.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (Cost-Sharing Pension Plan):	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered-Employee Payroll:	The payroll of employees that are provided with pensions through the pension plan.
Deferred Retirement Option Program (DROP):	A program that permits an employee to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The employee continues to provide service to the employer and is paid for that service by the employer after the DROP entry date; however, the pensions that would have been paid to the employee (if the employee had retired and not entered the DROP) are credited to an individual employee account within the defined benefit pension plan until the end of the DROP period.
Defined Benefit Pension Plans:	Pension plans that are used to provide defined benefit pensions.
Defined Benefit Pensions:	Pensions for which the income or other benefits that the employee will receive at or after separation from employment are defined by the benefit terms. The pensions may be stated as a specified dollar amount or as an amount that is calculated based on one or more factors such as age, years of service, and compensation. (A pension that does not meet the criteria of a defined contribution pension is classified as a defined benefit pension for purposes of Statement 68.)
Defined Contribution Pension Plans:	Pension plans that are used to provide defined contribution pensions.

Appendix – Glossary of Terms

Defined Contribution Pensions:	Pensions having terms that (1) provide an individual account for each employee; (2) define the contributions that an employer is required to make (or the credits that it is required to provide) to an active employee's account for periods in which that employee renders service; and (3) provide that the pensions an employee will receive will depend only on the contributions (or credits) to the employee's account, actual earnings on investments of those contributions (or credits), and the effects of forfeitures of contributions (or credits) made for other employees, as well as pension plan administrative costs, that are allocated to the employee's account.
Discount Rate:	The 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 total of the following: 1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension Plan Fiduciary Net Position is projected (under the requirements of Statement 68) to be greater than the benefit payments that are projected to be made in that period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments. 2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.
Entry Age Actuarial Cost Method:	A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the actuarial accrued liability.
Inactive Employees:	Terminated individuals that have accumulated benefits but are not yet receiving them, and retirees or their beneficiaries currently receiving benefits.
Measurement Period:	The period between the prior and the current measurement dates.
Multiple-Employer Defined Benefit Pension Plan:	A defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
Net Pension Liability (NPL):	The liability of employers and non-employer contributing entities to employees for benefits provided through a defined benefit pension plan.
Non-Employer Contributing Entities:	Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statement 68, employees are not considered non-employer contributing entities.
Other Postemployment Benefits:	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits, regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.
Pension Plans:	Arrangements through which pensions are determined, assets dedicated for pensions are accumulated and managed and benefits are paid as they come due.

Appendix – Glossary of Terms

Pensions:	Retirement income and, if provided through a pension plan, postemployment benefits other than retirement income (such as death benefits, life insurance, and disability benefits). Pensions do not include postemployment healthcare benefits and termination benefits.
Plan Members:	Individuals that are covered under the terms of a pension plan. Plan members generally include (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).
Postemployment:	The period after employment.
Postemployment Benefit Changes:	Adjustments to the pension of an inactive employee.
Postemployment Healthcare Benefits:	Medical, dental, vision, and other health-related benefits paid subsequent to the termination of employment.
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 their expected future service.
Public Employee Retirement System:	A special-purpose government that administers one or more pension plans; also may administer other types of employee benefit plans, including postemployment healthcare plans and deferred compensation plans.
Real Rate of Return:	The rate of return on an investment after adjustment to eliminate inflation.
Service Costs:	The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.
Single Employer:	An employer whose employees are provided with pensions through a single-employer defined benefit pension plan.
Single-Employer Defined Benefit Pension Plan (Single-Employer Pension Plan):	A defined benefit pension plan that is used to provide pensions to employees of only one employer.
Special Funding Situations:	Circumstances in which a non-employer entity is legally responsible for making contributions directly to a pension plan that is used to provide pensions to the employees of another entity or entities and either of the following conditions exists: 1. The amount of contributions for which the non-employer entity legally is responsible is not dependent upon one or more events or circumstances unrelated to the pensions. 2. The non-employer entity is the only entity with a legal obligation to make contributions directly to a pension plan.
Termination Benefits:	Inducements offered by employers to active employees to hasten the termination of services, or payments made in consequence of the early termination of services. Termination benefits include early-retirement incentives, severance benefits, and other termination-related benefits.
Total Pension Liability (TPL):	The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of Statement 68.