

**WORCESTER REGIONAL RETIREMENT SYSTEM**

**INDEPENDENT AUDITORS' REPORT ON  
SCHEDULES OF EMPLOYER ALLOCATIONS AND  
SCHEDULES OF PENSION AMOUNTS BY EMPLOYER**

**FOR THE YEAR ENDED DECEMBER 31, 2017**



**WORCESTER REGIONAL RETIREMENT SYSTEM**  
**INDEPENDENT AUDITORS' REPORT ON**  
**SCHEDULES OF EMPLOYER ALLOCATIONS AND**  
**SCHEDULES OF PENSION AMOUNTS BY EMPLOYER**  
**FOR THE YEAR ENDED DECEMBER 31, 2017**

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# *Independent Auditors' Report*

## **Independent Auditors' Report**

To the Honorable Retirement Board  
Worcester Regional Retirement System  
Auburn, Massachusetts 01501

### **Report on Schedules**

We have audited the accompanying schedule of employer allocations of the Worcester Regional Retirement System as of and for the year ended December 31, 2017, and the related notes. We have also audited the total for all entities of the rows titled ending net pension liability, total deferred outflows of resources, total deferred inflows of resources, pension expense, and covered payroll as of and for the year ended December 31, 2017 and the beginning net pension liability, as of and for the year ended December 31, 2016 (specified row totals) included in the accompanying schedule of pension amounts by employer of the Worcester Regional Retirement System, and the related notes.

### **Management's Responsibility for the Schedules**

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

### **Auditor's Responsibility**

Our responsibility is to express opinions on the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

**Opinions**

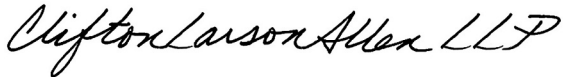
In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and ending net pension liability, total deferred outflows of resources, total deferred inflows of resources, total pension expense and total covered payroll for the total of all participating entities for the Worcester Regional Retirement System as of and for the year ended December 31, 2017 and the beginning net pension liability for the total of all participating entities of the Worcester Regional Retirement System as of and for the year ended December 31, 2016, in accordance with accounting principles generally accepted in the United States of America.

**Other Matter**

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the Worcester Regional Retirement System as of and for the year ended December 31, 2017, and our report thereon, dated September 20, 2018, expressed an unmodified opinion on those financial statements.

**Restriction on Use**

Our report is intended solely for the information and use of the Worcester Regional Retirement System management, the Worcester Regional Retirement System Board of Retirement, the Worcester Regional Retirement System employers and their auditors and is not intended to be and should not be used by anyone other than these specified parties.



**CliftonLarsonAllen LLP**

Boston, Massachusetts  
September 20, 2018

## *Schedule of Employer Allocations*



WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF EMPLOYER ALLOCATIONS  
FOR THE YEAR ENDED DECEMBER 31, 2017

Employer	Employer Contributions	Employer Allocation Percentage
Ashburnham	\$ 673,313	1.330676%
Ashburnham-Westminster Regional	549,269	1.085526%
Athol	1,214,566	2.400360%
Athol Housing Authority	34,263	0.067714%
Athol-Royalston Regional	478,043	0.944762%
Auburn	2,633,613	5.204838%
Auburn Housing Authority	55,533	0.109750%
Auburn Water District	85,812	0.169591%
Barre	272,096	0.537746%
Barre Housing Authority	13,640	0.026957%
Berlin	419,681	0.829420%
Berlin-Boylston Regional	111,699	0.220752%
Blackstone	666,186	1.316591%
Blackstone Housing Authority	17,102	0.033799%
Blackstone-Millville Regional	445,596	0.880636%
Bolton	374,912	0.740943%
Boylston	555,757	1.098349%
Boylston Water District	9,366	0.018510%
Brookfield	247,043	0.488234%
Charlton	1,063,085	2.100986%
Cherry Valley-Rochdale Water	40,675	0.080386%
Cherry Valley Sewer District	1,519	0.003002%
Douglas	914,509	1.807354%
Dudley	732,393	1.447436%
Dudley Housing Authority	11,953	0.023623%
Dudley-Charlton Regional	845,764	1.671493%
East Brookfield	127,037	0.251065%
Grafton	1,527,028	3.017882%
Grafton Housing Authority	46,298	0.091499%
Hardwick	173,984	0.343846%
Harvard	756,788	1.495648%
Hillcrest Water District	6,452	0.012751%
Holden	1,878,211	3.711929%
Holden Housing Authority	26,631	0.052631%
Hopedale	833,168	1.646599%
Hopedale Housing Authority	4,348	0.008593%
Hubbardston	238,741	0.471826%
Lancaster	508,868	1.005681%
Lancaster Housing Authority	13,397	0.026477%
Leicester	1,055,412	2.085822%
Leicester Housing Authority	34,326	0.067839%
Leicester Water District	40,028	0.079108%
Lunenburg	1,106,982	2.187741%
Lunenburg Housing Authority	1,285	0.002540% (continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF EMPLOYER ALLOCATIONS  
FOR THE YEAR ENDED DECEMBER 31, 2017

Employer	Employer Contributions	Employer Allocation Percentage
Lunenburg Water District	\$ 43,998	0.086954%
Mendon	519,386	1.026468%
Mendon-Upton Regional	649,442	1.283499%
Millbury	1,590,876	3.144066%
Millbury Housing Authority	82,506	0.163058%
Millville	148,282	0.293051%
Narragansett Regional	336,860	0.665740%
Nashoba Regional	896,139	1.771049%
New Braintree	45,267	0.089462%
Northboro	1,699,113	3.357976%
Northboro Housing Authority	56,695	0.112047%
Northboro-Southboro Regional	324,449	0.641212%
North Brookfield	384,681	0.760249%
North Brookfield Housing Authority	16,072	0.031763%
Oakham	58,451	0.115517%
Oxford	1,705,012	3.369634%
Oxford Housing Authority	52,150	0.103065%
Oxford-Rochdale Sewer District	26,515	0.052402%
Paxton	598,706	1.183229%
Petersham	138,452	0.273624%
Phillipston	112,731	0.222792%
Princeton	317,271	0.627026%
Quabbin Regional	859,367	1.698376%
Quaboag Regional	301,439	0.595737%
Royalston	47,264	0.093408%
Rutland	511,543	1.010968%
Southboro	1,611,713	3.185246%
Southboro Housing Authority	14,141	0.027947%
Spencer	762,375	1.506690%
Spencer-East Brookfield Regional	523,348	1.034298%
Spencer Housing Authority	35,499	0.070157%
Sterling	847,421	1.674767%
Sterling Housing Authority	8,167	0.016141%
Sturbridge	1,171,263	2.314780%
Sutton	966,685	1.910470%
Tantasqua Regional	574,007	1.134416%
Templeton	667,573	1.319332%
Templeton Housing Authority	37,368	0.073851%
Upton	511,372	1.010630%
Uxbridge	1,566,330	3.095555%
Uxbridge Housing Authority	42,581	0.084153%
Wachusett Regional	1,678,385	3.317011%
Warren	330,813	0.653789%
Warren Water District	14,096	0.027858% (continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF EMPLOYER ALLOCATIONS  
FOR THE YEAR ENDED DECEMBER 31, 2017

<u>Employer</u>	<u>Employer Contributions</u>	<u>Employer Allocation Percentage</u>
Westboro	\$ 3,394,054	6.707706%
Westboro Housing Authority	33,774	0.066748%
West Boylston	1,058,022	2.090980%
West Boylston Housing Authority	9,208	0.018198%
West Boylston Water District	45,645	0.090209%
West Brookfield	233,082	0.460642%
Westminster	735,164	1.452913%
Winchendon	1,274,147	2.518111%
Winchendon Housing Authority	<u>84,054</u>	<u>0.166117%</u>
Totals	<u>\$ 50,599,326</u>	<u>100.000000%</u>

*Schedule of Pension Amounts by Employer*

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Ashburnham	Ashburnham- Westminster Regional	Athol	Athol Housing Authority
<u>Net Pension Liability</u>				
Beginning Net Pension Liability	\$ 10,418,478	8,524,725	29,628,351	1,061,692
Ending Net Pension Liability	\$ 10,850,701	8,851,684	19,573,204	552,162
<u>Deferred Outflows of Resources</u>				
Net Difference Between Expected and Actual Experience	\$ 72,183	58,885	130,209	3,673
Assumption Changes	\$ 1,034,040	843,539	1,865,268	52,619
Change in Allocated Proportion	\$ 505,908	394,869	10,448,376	380,600
Total Deferred Outflows of Resources	\$ 1,612,131	1,297,293	12,443,853	436,892
<u>Deferred Inflows of Resources</u>				
Net Difference Between Projected and Actual Investment Earnings	338,328	275,998	610,298	17,217
Change in Allocated Proportion	\$ 437,358	170,253	6,625,323	353,036
Total Deferred Inflows of Resources	\$ 775,686	446,251	7,235,621	370,253
<u>Pension Expense</u>				
Proportionate Share of Pension Expense	\$ 1,406,447	1,147,338	2,537,040	71,570
Net Amortization of Deferred Amounts from Changes in Proportion	\$ (43,255)	24,259	2,166,473	55,461
Total Pension Expense	\$ 1,363,192	1,171,597	4,703,513	127,031
Covered Payroll	\$ 3,252,999	3,456,372	4,915,678	238,879

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Athol- Royalston Regional	Auburn	Auburn Housing Authority	Auburn Water District	Barre
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	12,541,482	40,458,273	877,291	1,456,841	4,311,118
Ending Net Pension Liability	7,703,849	42,441,700	894,936	1,382,894	4,384,933
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	51,249	282,339	5,953	9,200	29,170
Assumption Changes	734,154	4,044,568	85,285	131,786	417,871
Change in Allocated Proportion	4,500,486	2,182,536	32,830	28,771	142,002
Total Deferred Outflows of Resources	5,285,889	6,509,443	124,068	169,757	589,043
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	240,208	1,323,345	27,904	43,119	136,724
Change in Allocated Proportion	3,332,723	182,303	128,421	25,294	525,068
Total Deferred Inflows of Resources	3,572,931	1,505,648	156,325	68,413	661,792
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	998,558	5,501,210	116,000	179,248	568,366
Net Amortization of Deferred Amounts from Changes in Proportion	828,675	389,161	(36,437)	4,273	(147,756)
Total Pension Expense	1,827,233	5,890,371	79,563	183,521	420,610
Covered Payroll	2,353,633	14,036,616	266,335	529,006	1,768,710

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WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Barre Housing Authority	Berlin	Berlin- Boylston Regional	Blackstone	Blackstone Housing Authority
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	212,059	6,417,586	1,754,720	10,082,957	246,701
Ending Net Pension Liability	219,814	6,763,323	1,800,073	10,735,847	275,605
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	1,462	44,992	11,975	71,419	1,833
Assumption Changes	20,948	644,525	171,542	1,023,094	26,264
Change in Allocated Proportion	16,694	542,423	65,595	671,349	30,116
Total Deferred Outflows of Resources	39,104	1,231,940	249,112	1,765,862	58,213
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	6,854	210,882	56,127	334,747	8,593
Change in Allocated Proportion	-	-	93,650	1,350,573	-
Total Deferred Inflows of Resources	6,854	210,882	149,777	1,685,320	8,593
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	28,492	876,649	233,322	1,391,559	35,723
Net Amortization of Deferred Amounts from Changes in Proportion	4,300	133,966	(18,136)	(317,385)	6,660
Total Pension Expense	32,792	1,010,615	215,186	1,074,174	42,383
Covered Payroll	100,268	1,809,105	541,031	3,862,150	37,083

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WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Blackstone- Millville Regional	Bolton	Boylston	Boylston Water District	Brookfield
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	7,661,333	5,856,055	8,063,655	135,688	3,728,896
Ending Net Pension Liability	7,180,953	6,041,853	8,956,241	150,937	3,981,194
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	47,770	40,193	59,580	1,004	26,484
Assumption Changes	684,324	575,771	853,503	14,384	379,396
Change in Allocated Proportion	73,144	471,313	790,360	13,679	250,819
Total Deferred Outflows of Resources	805,238	1,087,277	1,703,443	29,067	656,699
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	223,904	188,387	279,258	4,706	124,135
Change in Allocated Proportion	284,083	17,283	250,431	82,002	182,032
Total Deferred Inflows of Resources	507,987	205,670	529,689	86,708	306,167
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	930,781	783,133	1,160,890	19,564	516,035
Net Amortization of Deferred Amounts from Changes in Proportion	(38,310)	122,586	79,108	(24,879)	(9,218)
Total Pension Expense	892,471	905,719	1,239,998	(5,315)	506,817
Covered Payroll	2,552,660	2,079,408	2,804,604	60,809	1,075,165

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WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Charlton	Cherry Valley- Rochdale Water	Cherry Valley Sewer District	Douglas
<u>Net Pension Liability</u>				
Beginning Net Pension Liability	17,132,615	692,580	-	13,952,024
Ending Net Pension Liability	17,132,029	655,493	24,479	14,737,669
<u>Deferred Outflows of Resources</u>				
Net Difference Between Expected and Actual Experience	113,969	4,361	163	98,041
Assumption Changes	1,632,632	62,467	2,333	1,404,456
Change in Allocated Proportion	820,014	5,835	17,494	825,295
Total Deferred Outflows of Resources	<u>2,566,615</u>	<u>72,663</u>	<u>19,990</u>	<u>2,327,792</u>
<u>Deferred Inflows of Resources</u>				
Net Difference Between Projected and Actual Investment Earnings	534,182	20,438	763	459,525
Change in Allocated Proportion	4,702	52,245	1,816	163,614
Total Deferred Inflows of Resources	<u>538,884</u>	<u>72,683</u>	<u>2,579</u>	<u>623,139</u>
<u>Pension Expense</u>				
Proportionate Share of Pension Expense	2,220,620	84,964	3,173	1,910,268
Net Amortization of Deferred Amounts from Changes in Proportion	233,075	(14,369)	2,986	117,096
Total Pension Expense	<u>2,453,695</u>	<u>70,595</u>	<u>6,159</u>	<u>2,027,364</u>
Covered Payroll	5,223,794	274,647	-	5,726,211

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Dudley	Dudley Housing Authority	Dudley- Charlton Regional	East Brookfield	Grafton
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	12,639,235	376,906	13,842,943	1,675,607	24,934,206
Ending Net Pension Liability	11,802,799	192,627	13,629,816	2,047,251	24,608,648
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	78,517	1,281	90,671	13,619	163,706
Assumption Changes	1,124,772	18,357	1,298,881	195,097	2,345,132
Change in Allocated Proportion	-	-	228,186	407,391	238,896
Total Deferred Outflows of Resources	<u>1,203,289</u>	<u>19,638</u>	<u>1,617,738</u>	<u>616,107</u>	<u>2,747,734</u>
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	368,015	6,006	424,982	63,834	767,305
Change in Allocated Proportion	1,036,731	162,200	10,380	2,548	116,718
Total Deferred Inflows of Resources	<u>1,404,746</u>	<u>168,206</u>	<u>435,362</u>	<u>66,382</u>	<u>884,023</u>
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	1,529,856	24,968	1,766,670	265,361	3,189,723
Net Amortization of Deferred Amounts from Changes in Proportion	(302,354)	(38,137)	59,940	97,710	10,594
Total Pension Expense	<u>1,227,502</u>	<u>(13,169)</u>	<u>1,826,610</u>	<u>363,071</u>	<u>3,200,317</u>
Covered Payroll	3,132,977	51,225	4,952,250	562,695	9,948,856

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Grafton Housing Authority	Hardwick	Harvard	Hillcrest Water District	Holden
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	791,384	3,329,488	12,722,244	143,999	32,367,046
Ending Net Pension Liability	746,110	2,803,820	12,195,933	103,976	30,268,102
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	4,963	18,652	81,132	692	201,355
Assumption Changes	71,102	267,196	1,162,236	9,909	2,884,461
Change in Allocated Proportion	14,240	9,299	3,207	58,487	74,444
Total Deferred Outflows of Resources	90,305	295,147	1,246,575	69,088	3,160,260
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	23,264	87,424	380,273	3,242	943,768
Change in Allocated Proportion	21,088	469,442	624,599	25,877	1,478,102
Total Deferred Inflows of Resources	44,352	556,866	1,004,872	29,119	2,421,870
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	96,709	363,426	1,580,813	13,477	3,923,292
Net Amortization of Deferred Amounts from Changes in Proportion	275	(114,888)	(192,284)	10,234	(362,810)
Total Pension Expense	96,984	248,538	1,388,529	23,711	3,560,482
Covered Payroll	213,338	855,402	3,892,960	-	8,715,703

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Holden Housing Authority	Hopedale	Hopedale Housing Authority	Hubbardston	Lancaster
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	458,312	12,890,264	116,410	3,688,477	8,414,126
Ending Net Pension Liability	429,169	13,426,827	70,070	3,847,404	8,200,606
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	2,855	89,320	466	25,594	54,554
Assumption Changes	40,899	1,279,537	6,677	366,646	781,493
Change in Allocated Proportion	14,125	627,216	1,389	368,166	25,278
Total Deferred Outflows of Resources	57,879	1,996,073	8,532	760,406	861,325
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	13,382	418,652	2,185	119,963	255,697
Change in Allocated Proportion	14,160	646,712	34,615	22,190	76,707
Total Deferred Inflows of Resources	27,542	1,065,364	36,800	142,153	332,404
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	55,628	1,740,359	9,082	498,693	1,062,947
Net Amortization of Deferred Amounts from Changes in Proportion	1,751	(88,537)	(7,252)	94,418	(19,715)
Total Pension Expense	57,379	1,651,822	1,830	593,111	1,043,232
Covered Payroll	120,102	4,840,183	-	1,094,952	2,689,773

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WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Lancaster Housing Authority	Leicester	Leicester Housing Authority	Leicester Water District	Lunenburg
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	146,086	17,661,849	613,812	797,920	18,136,490
Ending Net Pension Liability	215,898	17,008,376	553,177	645,067	17,839,446
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	1,436	113,146	3,680	4,291	118,675
Assumption Changes	20,574	1,620,848	52,716	61,473	1,700,046
Change in Allocated Proportion	53,640	22,945	1,558	-	328,810
Total Deferred Outflows of Resources	75,650	1,756,939	57,954	65,764	2,147,531
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	6,732	530,326	17,248	20,113	556,239
Change in Allocated Proportion	41,853	1,241,575	39,859	177,430	-
Total Deferred Inflows of Resources	48,585	1,771,901	57,107	197,543	556,239
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	27,984	2,204,592	71,702	83,612	2,312,314
Net Amortization of Deferred Amounts from Changes in Proportion	(3,049)	(395,945)	(8,872)	(43,852)	89,008
Total Pension Expense	24,935	1,808,647	62,830	39,760	2,401,322
Covered Payroll	51,542	5,205,603	183,792	245,965	5,865,311

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Lunenburg Housing Authority	Lunenburg Water District	Mendon	Mendon- Upton Regional	Millbury
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	63,835	810,818	8,067,655	10,503,488	26,104,168
Ending Net Pension Liability	20,708	709,045	8,370,108	10,466,011	25,637,587
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	138	4,717	55,681	69,624	170,551
Assumption Changes	1,973	67,570	797,646	997,380	2,443,186
Change in Allocated Proportion	-	11,907	590,282	399,498	197,618
Total Deferred Outflows of Resources	<u>2,111</u>	<u>84,194</u>	<u>1,443,609</u>	<u>1,466,502</u>	<u>2,811,355</u>
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	646	22,108	260,982	326,333	799,387
Change in Allocated Proportion	42,229	130,265	-	40,231	916,103
Total Deferred Inflows of Resources	<u>42,875</u>	<u>152,373</u>	<u>260,982</u>	<u>366,564</u>	<u>1,715,490</u>
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	2,684	91,905	1,084,917	1,356,584	3,323,094
Net Amortization of Deferred Amounts from Changes in Proportion	(10,210)	(33,343)	145,554	101,846	(266,840)
Total Pension Expense	<u>(7,526)</u>	<u>58,562</u>	<u>1,230,471</u>	<u>1,458,430</u>	<u>3,056,254</u>
Covered Payroll	43,051	280,959	2,674,232	4,331,019	7,071,781

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Millbury Housing Authority	Millville	Narragansett Regional	Nashoba Regional	New Braintree
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	1,371,003	2,082,447	5,824,310	13,258,496	1,076,866
Ending Net Pension Liability	1,329,616	2,389,622	5,428,630	14,441,629	729,495
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	8,845	15,897	36,113	96,071	4,853
Assumption Changes	126,709	227,724	517,332	1,376,245	69,519
Change in Allocated Proportion	26,885	547,075	-	1,096,235	48,457
Total Deferred Outflows of Resources	162,439	790,696	553,445	2,568,551	122,829
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	41,458	74,509	169,266	450,294	22,746
Change in Allocated Proportion	3,648	24,343	302,965	792,365	234,891
Total Deferred Inflows of Resources	45,106	98,852	472,231	1,242,659	257,637
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	172,342	309,738	703,648	1,871,896	94,556
Net Amortization of Deferred Amounts from Changes in Proportion	8,204	144,322	(79,055)	(37,927)	(32,335)
Total Pension Expense	180,546	454,060	624,593	1,833,969	62,221
Covered Payroll	402,818	682,493	1,903,545	6,360,163	184,094

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Northboro	Northboro Housing Authority	Northboro- Southboro Regional	North Brookfield	North Brookfield Housing Authority
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	27,829,488	883,826	4,773,948	6,660,251	262,996
Ending Net Pension Liability	27,381,868	913,662	5,228,622	6,199,284	259,007
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	182,155	6,078	34,783	41,240	1,723
Assumption Changes	2,609,411	87,069	498,272	590,773	24,683
Change in Allocated Proportion	295,545	100,682	415,203	6,772	12,490
Total Deferred Outflows of Resources	3,087,111	193,829	948,258	638,785	38,896
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	853,775	28,488	163,030	193,296	8,076
Change in Allocated Proportion	497,671	1,271	277,567	385,726	-
Total Deferred Inflows of Resources	1,351,446	29,759	440,597	579,022	8,076
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	3,549,184	118,427	677,724	803,539	33,572
Net Amortization of Deferred Amounts from Changes in Proportion	(102,571)	28,661	(7,607)	(101,686)	3,749
Total Pension Expense	3,446,613	147,088	670,117	701,853	37,321
Covered Payroll	10,251,693	392,781	1,995,581	2,072,387	56,674

(continued)



WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Oakham	Oxford	Oxford Housing Authority	Oxford- Rochdale Sewer District	Paxton
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	1,137,476	30,791,813	888,482	306,570	8,299,837
Ending Net Pension Liability	941,961	27,476,933	840,418	427,300	9,648,380
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	6,266	182,787	5,591	2,843	64,185
Assumption Changes	89,766	2,618,470	80,089	40,720	919,462
Change in Allocated Proportion	-	-	19,699	120,575	1,127,181
Total Deferred Outflows of Resources	96,032	2,801,257	105,379	164,138	2,110,828
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	29,371	856,739	26,204	13,323	300,839
Change in Allocated Proportion	241,496	2,508,058	17,545	-	184,028
Total Deferred Inflows of Resources	270,867	3,364,797	43,749	13,323	484,867
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	122,095	3,561,506	108,933	55,386	1,250,604
Net Amortization of Deferred Amounts from Changes in Proportion	(65,809)	(610,021)	2,935	28,275	170,106
Total Pension Expense	56,286	2,951,485	111,868	83,661	1,420,710
Covered Payroll	203,353	7,340,857	329,350	80,192	3,036,780

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Petersham	Phillipston	Princeton	Quabbin Regional	Quaboag Regional
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	2,337,390	1,889,356	5,736,524	14,986,023	5,052,135
Ending Net Pension Liability	2,231,208	1,816,704	5,112,946	13,849,034	4,857,807
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	14,843	12,085	34,013	92,129	32,316
Assumption Changes	212,628	173,127	487,249	1,319,772	462,935
Change in Allocated Proportion	-	153,615	79,509	-	-
Total Deferred Outflows of Resources	227,471	338,827	600,771	1,411,901	495,251
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	69,570	56,645	159,423	431,817	151,468
Change in Allocated Proportion	651,882	22,628	934,139	901,935	206,057
Total Deferred Inflows of Resources	721,452	79,273	1,093,562	1,333,752	357,525
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	289,205	235,478	662,730	1,795,085	629,659
Net Amortization of Deferred Amounts from Changes in Proportion	(215,729)	46,897	(250,462)	(233,550)	(62,820)
Total Pension Expense	73,476	282,375	412,268	1,561,535	566,839
Covered Payroll	581,892	518,030	1,776,813	4,633,757	2,019,582

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Royalston	Rutland	Southboro	Southboro Housing Authority	Spencer
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	855,495	7,445,877	26,413,514	234,820	11,972,140
Ending Net Pension Liability	761,678	8,243,715	25,973,383	227,888	12,285,970
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	5,067	54,840	172,785	1,516	81,731
Assumption Changes	72,586	785,602	2,475,187	21,717	1,170,817
Change in Allocated Proportion	113,065	710,967	233,049	-	461,571
Total Deferred Outflows of Resources	190,718	1,551,409	2,881,021	23,233	1,714,119
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	23,749	257,041	809,858	7,106	383,080
Change in Allocated Proportion	50,865	450,501	260,022	27,688	314,808
Total Deferred Inflows of Resources	74,614	707,542	1,069,880	34,794	697,888
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	98,727	1,068,534	3,366,619	29,538	1,592,483
Net Amortization of Deferred Amounts from Changes in Proportion	27,546	(5,550)	(37,331)	(8,904)	(10,801)
Total Pension Expense	126,273	1,062,984	3,329,288	20,634	1,581,682
Covered Payroll	238,569	2,851,634	9,256,067	53,417	3,458,720

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Spencer- East Brookfield Regional	Spencer Housing Authority	Sterling	Sterling Housing Authority	Sturbridge
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	8,634,600	634,194	13,633,694	129,446	18,270,609
Ending Net Pension Liability	8,433,957	572,080	13,656,520	131,614	18,875,360
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	56,106	3,806	90,848	876	125,566
Assumption Changes	803,731	54,518	1,301,426	12,542	1,798,766
Change in Allocated Proportion	26,699	39,025	274,147	13,038	777,695
Total Deferred Outflows of Resources	886,536	97,349	1,666,421	26,456	2,702,027
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	262,973	17,838	425,814	4,104	588,539
Change in Allocated Proportion	100,527	32,395	279,352	661	96,178
Total Deferred Inflows of Resources	363,500	50,233	705,166	4,765	684,717
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	1,093,193	74,152	1,770,131	17,060	2,446,587
Net Amortization of Deferred Amounts from Changes in Proportion	(28,107)	6,370	(37,772)	3,705	130,427
Total Pension Expense	1,065,086	80,522	1,732,359	20,765	2,577,014
Covered Payroll	2,574,126	284,432	4,620,740	-	6,400,051

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Sutton	Tantasqua Regional	Templeton	Templeton Housing Authority	Upton
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	15,808,187	9,332,508	11,442,390	626,055	7,759,223
Ending Net Pension Liability	15,578,505	9,250,346	10,758,199	602,200	8,240,959
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	103,634	61,537	71,568	4,006	54,822
Assumption Changes	1,484,585	881,531	1,025,225	57,388	785,339
Change in Allocated Proportion	145,673	117,779	18,976	-	507,317
Total Deferred Outflows of Resources	<u>1,733,892</u>	<u>1,060,847</u>	<u>1,115,769</u>	<u>61,394</u>	<u>1,347,478</u>
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	485,742	288,429	335,444	18,777	256,956
Change in Allocated Proportion	818,990	88,880	1,349,032	80,020	547,324
Total Deferred Inflows of Resources	<u>1,304,732</u>	<u>377,309</u>	<u>1,684,476</u>	<u>98,797</u>	<u>804,280</u>
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	2,019,255	1,199,012	1,394,457	78,056	1,068,177
Net Amortization of Deferred Amounts from Changes in Proportion	(246,134)	(3,977)	(414,841)	(25,968)	(79,650)
Total Pension Expense	<u>1,773,121</u>	<u>1,195,035</u>	<u>979,616</u>	<u>52,088</u>	<u>988,527</u>
Covered Payroll	6,087,190	3,746,283	3,379,162	58,039	3,363,936

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Uxbridge	Uxbridge Housing Authority	Wachusett Regional	Warren	Warren Water District
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	26,771,228	900,397	24,584,493	4,923,172	200,402
Ending Net Pension Liability	25,242,018	686,209	27,047,828	5,331,180	227,163
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	167,920	4,565	179,933	35,465	1,511
Assumption Changes	2,405,490	65,394	2,577,578	508,046	21,648
Change in Allocated Proportion	306,417	42,886	2,225,290	439,259	40,208
Total Deferred Outflows of Resources	<u>2,879,827</u>	<u>112,845</u>	<u>4,982,801</u>	<u>982,770</u>	<u>63,367</u>
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	787,054	21,396	843,359	166,228	7,083
Change in Allocated Proportion	896,470	136,035	1,152,393	19,325	947
Total Deferred Inflows of Resources	<u>1,683,524</u>	<u>157,431</u>	<u>1,995,752</u>	<u>185,553</u>	<u>8,030</u>
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	3,271,821	88,945	3,505,887	691,017	29,444
Net Amortization of Deferred Amounts from Changes in Proportion	(146,013)	(13,670)	97,918	92,585	10,312
Total Pension Expense	<u>3,125,808</u>	<u>75,275</u>	<u>3,603,805</u>	<u>783,602</u>	<u>39,756</u>
Covered Payroll	7,722,133	209,477	11,159,876	1,457,012	84,934

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	Westboro	Westboro Housing Authority	West Boylston	West Boylston Housing Authority	West Boylston Water District
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	56,209,901	515,732	17,235,420	177,917	764,657
Ending Net Pension Liability	54,696,505	544,281	17,050,437	148,391	735,587
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	363,864	3,621	113,426	987	4,893
Assumption Changes	5,212,412	51,868	1,624,856	14,141	70,099
Change in Allocated Proportion	826,747	32,433	193,756	3,346	3,929
Total Deferred Outflows of Resources	<u>6,403,023</u>	<u>87,922</u>	<u>1,932,038</u>	<u>18,474</u>	<u>78,921</u>
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	1,705,453	16,971	531,638	4,627	22,936
Change in Allocated Proportion	18,492	-	564,244	17,736	93,724
Total Deferred Inflows of Resources	<u>1,723,945</u>	<u>16,971</u>	<u>1,095,882</u>	<u>22,363</u>	<u>116,660</u>
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	7,089,659	70,549	2,210,044	19,234	95,345
Net Amortization of Deferred Amounts from Changes in Proportion	267,302	6,965	(148,857)	(2,633)	(29,812)
Total Pension Expense	<u>7,356,961</u>	<u>77,514</u>	<u>2,061,187</u>	<u>16,601</u>	<u>65,533</u>
Covered Payroll	18,617,363	197,365	5,126,766	-	298,365

(continued)

WORCESTER REGIONAL RETIREMENT SYSTEM  
SCHEDULE OF PENSION AMOUNTS BY EMPLOYER  
FOR THE YEAR ENDED DECEMBER 31, 2017

	West Brookfield	Westminster	Winchendon	Winchendon Housing Authority	Totals
<u>Net Pension Liability</u>					
Beginning Net Pension Liability	3,890,208	12,186,476	22,792,062	1,287,821	837,593,763
Ending Net Pension Liability	3,756,207	11,847,454	20,533,375	1,354,563	815,427,852
<u>Deferred Outflows of Resources</u>					
Net Difference Between Expected and Actual Experience	24,988	78,814	136,596	9,011	5,424,541
Assumption Changes	357,955	1,129,027	1,956,770	129,086	77,707,861
Change in Allocated Proportion	-	432,552	30,359	135,678	39,088,874
Total Deferred Outflows of Resources	382,943	1,640,393	2,123,725	273,775	122,221,276
<u>Deferred Inflows of Resources</u>					
Net Difference Between Projected and Actual Investment Earnings	117,120	369,407	640,237	42,236	25,425,280
Change in Allocated Proportion	402,741	11,807	1,455,671	7	39,088,874
Total Deferred Inflows of Resources	519,861	381,214	2,095,908	42,243	64,514,154
<u>Pension Expense</u>					
Proportionate Share of Pension Expense	486,872	1,535,644	2,661,496	175,576	105,694,163
Net Amortization of Deferred Amounts from Changes in Proportion	(128,808)	141,884	(327,658)	36,319	-
Total Pension Expense	358,064	1,677,528	2,333,838	211,895	105,694,163
Covered Payroll	1,058,730	3,715,452	5,598,659	606,964	271,037,131

(concluded)



## *Notes to Schedules*

WORCESTER REGIONAL RETIREMENT SYSTEM  
NOTES TO SCHEDULES  
FOR THE YEAR ENDED DECEMBER 31, 2017

**NOTE 1 - DESCRIPTION OF THE ENTITY**

The Worcester Regional Retirement System (System) was established to provide retirement benefits to eligible employees of its member employers. The System is governed by a five-member board comprised of the Chairman/Chief Executive Officer, who serves ex-officio and is appointed by the other members of the board; two members who are elected by the participants in or retired from the services of the System; a fourth member appointed by the member employers; and a fifth member appointed by the other members of the board.

The System issued a publicly available audited financial statement for the year ended December 31, 2017. A copy may be obtained by submitting a request to the System's Chairman/Chief Executive Officer at 23 Midstate Drive, Suite 106, Auburn, Massachusetts 01501.

Plan Description

The System is a cost-sharing multiple-employer public employee retirement system established in 1937, under Massachusetts General Laws (MGL), Chapter 32, and is regulated by the Massachusetts Public Employee Retirement Administration Commission (PERAC). The System is a defined benefit pension plan that covers eligible employees of its member employers.

Membership

Membership in the System is mandatory immediately upon the commencement of employment for all permanent full-time employees working at least 20 hours weekly, except for school teachers and school administrators who participate in the Massachusetts Teachers' Retirement System.

Benefits

Benefit provisions and state law establishes contribution requirements of the System. Members of the System become vested after 10 years of creditable service. Normal retirement occurs at age 65 (age 67 if hired on or after April 2, 2012), except for certain public safety employees and other special situations.

For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 65, this percentage is 2.5%, which is reduced for individuals who retire prior to age 65 to reflect the longer pay out period. A member's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement.

For employees hired on or after April 2, 2012, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 67, this percentage is 2.5%. A member's final five-year average salary is defined as the greater of the highest consecutive five-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last five years of creditable service prior to retirement.

WORCESTER REGIONAL RETIREMENT SYSTEM  
NOTES TO SCHEDULES  
FOR THE YEAR ENDED DECEMBER 31, 2017

Employees may elect early retirement after 20 years of service or at any time after attaining age 55 (age 60 if hired on or after April 2, 2012) with 10 years of eligible service. Plan members who become permanently and totally disabled may be eligible to receive a disability retirement allowance. The amount of benefits to be received depends on several factors, including the member's age, compensation, veteran status, years of service and whether or not the disability is work-related. In addition, certain death benefits exist for beneficiaries of employees who die in active service.

Under MGL, c.32 Section 3(8)(c), members leaving a member employer to work for other Massachusetts governmental units requires the System transfer their accumulated account balances and creditable service to the retirement system of their new employer. Other such retirement systems are in turn required to make comparable transfers to the System for employees coming to work at a member employer of the System. Per statute, the PERAC actuary shall consider length of service as well as acceptance of military service credit and salary cap provisions if applicable in calculating the liability.

Contributions

Chapter 32 of MGL governs the contributions of plan members and member employers. Depending on their employment date, active System members must contribute anywhere between 5%-9% of their gross regular compensation. Members hired after December 31, 1978 must contribute an additional 2% of regular compensation in excess of \$30,000. Employees in Group 1 hired on or after April 2, 2012 with 30 years of creditable service or greater will pay a base contribution rate of 6%. These deductions earn interest at a rate determined by PERAC that vests based upon years of service. Employers are required to pay into the System its share of the system-wide actuarial determined contribution, in accordance with Chapter 32, Section 22D of MGL, apportioned among the employers based on annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability.

Except for a portion of benefits owed due to cost-of-living adjustments (COLA's) granted through June 30, 1998, member employers are required to contribute the remaining amounts necessary to finance benefits. Member employer contributions are determined by actuarial valuations.

COLA's granted through June 30, 1998 are reimbursed by the Commonwealth of Massachusetts (the Commonwealth). COLA's granted subsequent to June 30, 1998 must be granted by the Board and are the responsibility of the System. COLA's may be approved in excess of the Consumer Price Index but not to exceed 3% of the base retirement allowance.

**NOTE 2 - ACTUARIAL ASSUMPTIONS AND METHODS**

The total pension liability was determined by an actuarial valuation as of January 1, 2016, using the following actuarial assumptions, applied to all periods included in the measurement that was updated to December 31, 2017:

Amortization method:	Payment increases 4.0% per year, except for Early Retirement Incentive (ERI) Programs for 2002 and 2003 (4.5%) and 2010 (level dollar)
Remaining amortization period:	19 years, except for ERI for 2002 and 2003 (12 years) and 2010 (6 years)
Asset valuation method:	5-year smoothed market value
Inflation:	3.0% per year

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Salary increases:	Group 1: 4.25-6.00%, based on service
	Group 4: 4.75-7.00%, based on service
Investment rate of return:	7.75%, net of pension plan investment expense, including inflation
Mortality rates:	Based on the RP-2000 Mortality Table (base year 2009) with full generational mortality improvement using Scale BB.
	For disabled lives, the mortality rates were based on the RP-2000 Mortality Table (base year 2012) with full generational mortality improvement using Scale BB.

The actuarial assumptions used in the January 1, 2016 valuation were based on the results of an actuarial experience study for the period January 1, 2015 through December 31, 2015.

**NOTE 3 - NET PENSION LIABILITY**

The components of the net pension liability of the System at December 31, 2017, were as follows:

Total pension liability	\$ 1,521,421,139
Plan fiduciary net position	<u>(705,993,287)</u>
Net pension liability	<u>\$ 815,427,852</u>
Plan fiduciary net position as a percentage of the total pension liability	46.40%

The total pension liability is calculated by the System's actuary and plan fiduciary net position is reported in the System's financial statements. The net pension liability is disclosed in accordance with the requirements of Governmental Accounting Standards Board (GASB) Statement No. 67 in the System's notes to financial statements and required supplementary information.

Discount Rate

The discount rate used to measure the total pension liability was 7.75 percent. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rates and that member employer contributions will be made in accordance with Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws. Based on those assumptions, the System's fiduciary net position was projected to be available to make all projected future benefit payments of 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 total pension liability.

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Long-Term Expected Rate of Return

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2016 are summarized in the following table:

<u>Asset Class</u>	<u>Target Allocation (%)</u>	<u>Long-Term Expected Rate of Return (%)</u>
Global Equity	40.00	4.91
Fixed Income	22.00	2.04
Private Equity	11.00	6.50
Real Estate	10.00	3.70
Timber/Natural Resources	4.00	3.25
Hedge Funds	13.00	3.40

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the System calculated using the discount rate of 7.75 percent, as well as what the System's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75 percent) or 1-percentage-point higher (8.75 percent) than the current rate:

	<u>1% Decrease (6.75%)</u>	<u>Current Discount Rate (7.75%)</u>	<u>1% Increase (8.75%)</u>
Net pension liability	993,831,171	815,427,852	664,765,107

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**NOTE 4 - DEFERRED INFLOWS OF RESOURCES AND DEFERRED OUTFLOWS OF RESOURCES**

The following schedule reflects the amortization of the balance of deferred inflows of resources and deferred outflows of resources at December 31, 2017:

Measurement Period	Amount
<u>Ending December 31:</u>	<u>Amount</u>
2018	\$ 21,004,058
2019	20,914,585
2020	12,007,463
2021	3,781,016
2022	-
Thereafter	-

**NOTE 5 - EMPLOYER CONTRIBUTIONS**

Employers' proportionate shares were calculated on the basis of actual employer contributions for the year ended December 31, 2017. Although GASB Statement No. 68 encourages the use of the employer's projected long-term contribution effort to the System, allocating on the basis of historical employer contributions is considered acceptable.

**NOTE 6 - ADDITIONAL FINANCIAL AND ACTUARIAL INFORMATION**

Information contained in these Notes to Schedules was extracted from the audited financial statements of the System for the year ended December 31, 2017. Additional financial information supporting the preparation of the Schedules (including the unqualified audit opinion on the financial statements and required supplementary information) is located in the audited financial statements of the System for the year ended December 31, 2017. A copy may be obtained by submitting a request to the System's Chairman/Chief Executive Officer at 23 Midstate Drive, Suite 106, Auburn, Massachusetts 01501.