

**CITY OF MADISON HEIGHTS  
POLICEMEN AND FIREMEN RETIREMENT SYSTEM  
ACTUARIAL VALUATION REPORT  
JUNE 30, 2014**

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232	Item 233	Item 234	Item 235	Item 236	Item 237	Item 238	Item 239	Item 240	Item 241	Item 242	Item 243	Item 244	Item 245	Item 246	Item 247	Item 248	Item 249	Item 250	Item 251	Item 252	Item 253	Item 254	Item 255	Item 256	Item 257	Item 258	Item 259	Item 260	Item 261	Item 262	Item 263	Item 264	Item 265	Item 266	Item 267	Item 268	Item 269	Item 270	Item 271	Item 272	Item 273	Item 274	Item 275	Item 276	Item 277	Item 278	Item 279	Item 280	Item 281	Item 282	Item 283	Item 284	Item 285	Item 286	Item 287	Item 288	Item 289	Item 290	Item 291	Item 292	Item 293	Item 294	Item 295	Item 296	Item 297	Item 298	Item 299	Item 300	Item 301	Item 302	Item 303	Item 304	Item 305	Item 306	Item 307	Item 308	Item 309	Item 310	Item 311	Item 312	Item 313	Item 314	Item 315	Item 316	Item 317	Item 318	Item 319	Item 320	Item 321	Item 322	Item 323	Item 324	Item 325	Item 326	Item 327	Item 328	Item 329	Item 330	Item 331	Item 332	Item 333	Item 334	Item 335	Item 336	Item 337	Item 338	Item 339	Item 340	Item 341	Item 342	Item 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454	Item 455	Item 456	Item 457	Item 458	Item 459	Item 460	Item 461	Item 462	Item 463	Item 464	Item 465	Item 466	Item 467	Item 468	Item 469	Item 470	Item 471	Item 472	Item 473	Item 474	Item 475	Item 476	Item 477	Item 478	Item 479	Item 480	Item 481	Item 482	Item 483	Item 484	Item 485	Item 486	Item 487	Item 488	Item 489	Item 490	Item 491	Item 492	Item 493	Item 494	Item 495	Item 496	Item 497	Item 498	Item 499	Item 500	Item 501	Item 502	Item 503	Item 504	Item 505	Item 506	Item 507	Item 508	Item 509	Item 510	Item 511	Item 512	Item 513	Item 514	Item 515	Item 516	Item 517	Item 518	Item 519	Item 520	Item 521	Item 522	Item 523	Item 524	Item 525	Item 526	Item 527	Item 528	Item 529	Item 530	Item 531	Item 532	Item 533	Item 534	Item 535	Item 536	Item 537	Item 538	Item 539	Item 540	Item 541	Item 542	Item 543	Item 544	Item 545	Item 546	Item 547	Item 548	Item 549	Item 550	Item 551	Item 552	Item 553	Item 554	Item 555	Item 556	Item 557	Item 558	Item 559	Item 560	Item 561	Item 562	Item 563	Item 564	Item 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898	Item 899	Item 900	Item 901	Item 902	Item 903	Item 904	Item 905	Item 906	Item 907	Item 908	Item 909	Item 910	Item 911	Item 912	Item 913	Item 914	Item 915	Item 916	Item 917	Item 918	Item 919	Item 920	Item 921	Item 922	Item 923	Item 924	Item 925	Item 926	Item 927	Item 928	Item 929	Item 930	Item 931	Item 932	Item 933	Item 934	Item 935	Item 936	Item 937	Item 938	Item 939	Item 940	Item 941	Item 942	Item 943	Item 944	Item 945	Item 946	Item 947	Item 948	Item 949	Item 950	Item 951	Item 952	Item 953	Item 954	Item 955	Item 956	Item 957	Item 958	Item 959	Item 960	Item 961	Item 962	Item 963	Item 964	Item 965	Item 966	Item 967	Item 968	Item 969	Item 970	Item 971	Item 972	Item 973	Item 974	Item 975	Item 976	Item 977	Item 978	Item 979	Item 980	Item 981	Item 982	Item 983	Item 984	Item 985	Item 986	Item 987	Item 988	Item 989	Item 990	Item 991	Item 992	Item 993	Item 994	Item 995	Item 996	Item 997	Item 998	Item 999	Item 1000
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December 17, 2014

The Retirement Board  
City of Madison Heights Policemen  
and Firemen Retirement System  
Madison Heights, Michigan

Dear Board Members:

*Submitted in this report* are the results of the Fifty-Eighth Annual Actuarial Valuation of the City of Madison Heights Policemen and Firemen Retirement System, based upon Act No. 345 of the Public Acts of 1937, as amended. The purpose of the June 30, 2014 valuation and gain/loss analysis is to measure funding progress in relation to the actuarial cost method and to determine employer contribution rates for the fiscal year ending June 30, 2016. The results of the valuation are not applicable for other purposes.

Calculations required for compliance with the Governmental Accounting Standards Board (GASB) Statement No. 67 were issued in a separate report dated September 5, 2014.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. This report should not be relied on for any purpose other than the purpose described.

The valuation was based upon information, furnished by the City Treasurer, concerning Retirement System benefits, financial transactions, and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. We are not responsible for the accuracy or completeness of the data provided.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events. We believe that the assumptions and methods used in this report are reasonable and appropriate for the purpose for which they have been used. However, other assumptions and methods could also be reasonable and could result in materially different results. In addition, because it is not possible or practical to consider every possible contingency, we may use summary information, estimates or simplifications of calculations to facilitate the modeling of future events. We may also exclude factors or data that are deemed to be immaterial. The actuarial methods and assumptions used in the actuarial valuation are summarized in Section D of this report. The assumptions are established by the Board after consulting with the actuary.




Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

To the best of our knowledge, this report is complete and accurate and was made in accordance with generally recognized actuarial methods recognized by the Actuarial Standards Board of the American Academy of Actuaries and in compliance with the provisions of Act 345, as amended. The actuarial assumptions used for the valuation produce results which individually and, in the aggregate, are reasonable.

Brad Lee Armstrong and Heidi G. Barry are independent of the plan sponsor and are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



Brad Lee Armstrong,  
ASA, EA, FCA, MAAA



Heidi G. Barry  
ASA, MAAA

BLA/HGB:ah





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## **SECTION A**

### **BASIC FINANCIAL OBJECTIVE AND OPERATION OF THE RETIREMENT SYSTEM**

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## Basic Financial Objective and Operation of the Retirement System

***Benefit Promises Made Which Must Be Paid For.*** A retirement system is an orderly means of handing out, keeping track of, and financing contingent pension promises to a group of employees. As each member of the retirement system acquires a unit of service credit he is, in effect, handed an "IOU" which reads: "The Employees Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire."

The principal related financial question is: When shall the money required to cover the "IOU" be contributed? This year, when the benefit of the member's service is received? Or, some future year when the "IOU" becomes a cash demand?

The constitution of the State of Michigan is directed to the question:

"Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities."

Section 9(2) of Act 345 is also directed to the question:

"Sec. 9(2). - - - For the purpose of creating and maintaining a fund for the payment of the pensions and other benefits payable hereunder the said city, village or municipality, subject to the provisions of this act, shall appropriate, at the end of such regular intervals as may be adopted, quarterly, semi-annually, or annually, an amount sufficient to maintain actuarially determined reserves covering pensions payable or which might be payable on account of service performed and to be performed by active members and pensions being paid retired members and beneficiaries - - - ."

This retirement system meets this constitutional requirement by having as its *financial objective to establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level from year-to-year* and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

**Normal Cost** (the current value of benefits likely to be paid on account of members' service being rendered in the current year)

... plus ...

Interest on the Unfunded Actuarial Accrued Liability (the difference between the actuarial accrued liability and current system assets).

A by-product of the level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. *Invested assets are a by-product of level percent-of-payroll contributions, not the objective.* Investment income becomes a major contributor to the retirement system and the amount is directly related to the amount of contributions and investment performance.

If contributions to the retirement system are less than the preceding amount, the difference, plus investment earnings not realized thereon, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate; that is:

$$B = C + I - E$$

The aggregate amount of **B**enefit payments to any group of members and their beneficiaries cannot exceed the sum of:

The aggregate amount of **C**ontributions received on behalf of the group

... plus ...

**I**nternal investment earnings on contributions received and not required for immediate payment of benefits

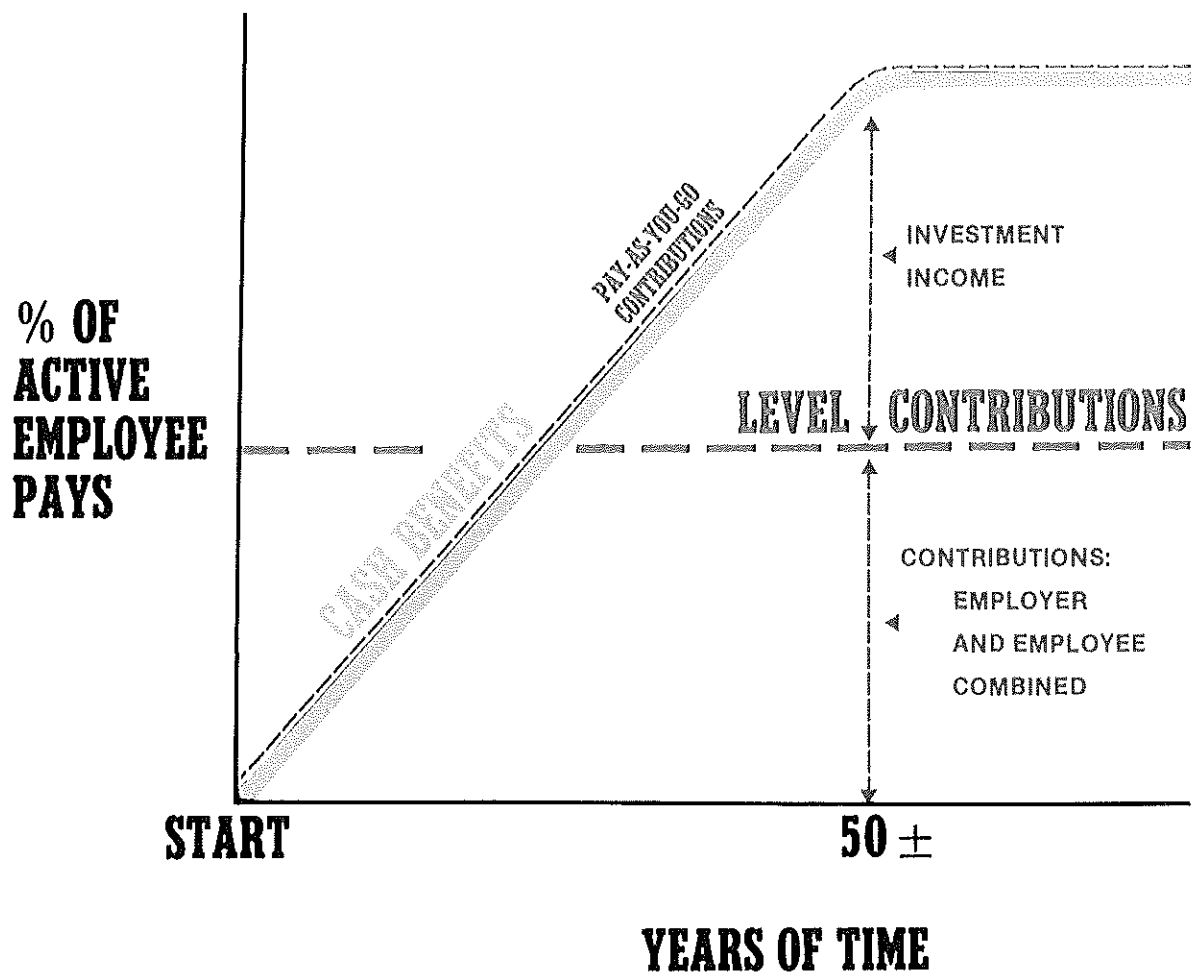
... minus ...

The **E**xpenses of operating the program.

There are retirement systems designed to defer the bulk of contributions far into the future. Lured by artificially low present contributions, the inevitable consequence of a relentlessly increasing contribution rate -- to a level greatly in excess of the level percent-of-payroll rate -- is ignored.

*This method of financing is prohibited in Michigan by the state constitution.*

**Computed Contribution Rate Needed to Finance Benefits.** From a given schedule of benefits and from the data furnished him, the actuary calculates the contribution rate by means of an actuarial valuation - the technique of assigning monetary values to the risks assumed in operating a retirement system.



**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

**Economic Risk Areas**

- Rates of investment return
- Rates of pay increase
- Changes in active member group size

**Non-Economic Risk Areas**

- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

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**SECTION B**  
VALUATION RESULTS

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# City's Computed Contributions for the Fiscal Year Beginning July 1, 2015

Contributions for	Contributions Expressed as Percents of Annual Pay							
	Department Heads	Police		Fire		Totals		
		Command	Other	Command	Other			
<b>NORMAL COST</b>								
Age and service pensions	22.19 %	19.46 %	18.62 %	17.69 %	17.69 %	18.68 %		
Disability pensions	0.69	0.81	1.03	1.23	1.06	0.99		
Death pensions	<u>0.82</u>	<u>0.69</u>	<u>0.68</u>	<u>0.84</u>	<u>0.90</u>	<u>0.75</u>		
Totals	23.70	20.96	20.33	19.76	19.65	20.42		
<b>MEMBERS' CONTRIBUTIONS</b>								
Gross contributions	11.91	9.17	9.17	8.90	8.90	9.24		
Less prospective refunds	<u>0.70</u>	<u>0.70</u>	<u>0.67</u>	<u>0.48</u>	<u>0.47</u>	<u>0.61</u>		
Available for pensions	11.21	8.47	8.50	8.42	8.43	8.63		
<b>CITY'S NORMAL COST</b>	12.49	12.49	11.83	11.34	11.22	11.79		
<b>UNFUNDED ACTUARIAL ACCRUED LIABILITIES</b>								
Retirees and beneficiaries						0.00		
Active members*						<u>16.15</u>		
Totals						16.15		
<b>CITY'S TOTAL CONTRIBUTION (PENSIONS)</b>								
Administrative & Investment Expenses						27.94 %		
Retiree health insurance costs are not included in this report.						7.98 %		

Retiree health insurance costs are not included in this report.

\* Financed as a level percent-of-payroll over a closed period of 30 years.

*In financing the actuarial accrued liabilities*, the funding value of assets, \$49,322,706 were distributed as shown at the bottom of the page. Please see page C-10 for information concerning the reporting of assets, and page C-11 for the derivation of the funding value of assets.

<u>Market Value</u>	<u>Present Reserves Reported for</u>		
	<u>Member Actuarial Accrued Liabilities</u>	<u>Retired Life Actuarial Liabilities</u>	<u>Totals</u>
Employees' Contributions	\$ 8,071,001		\$ 8,071,001
Employer Contributions	(1,730,641)	\$ 15,397,651	13,667,010
Retired Benefit Payments		27,947,192	27,947,192
Deferred Retirement			
Totals *	\$ 6,340,360	\$ 43,344,843	\$ 49,685,203

\* As reported.

Assets were applied against actuarial accrued liabilities in determining unfunded actuarial accrued liabilities as follows:

	<u>Retired Lives</u>	<u>Active Members</u>	<u>Total</u>
Computed Actuarial Accrued Liabilities	\$ 43,344,843	\$ 27,148,637	\$ 70,493,480
Applied Assets (4-yr. smoothed market value)	43,344,843	5,977,863	49,322,706
Unfunded Actuarial Accrued Liabilities	\$ -	\$ 21,170,774	\$ 21,170,774

## Derivation of Experience Gain (Loss) Year Ended June 30, 2014

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is hoped that aggregate gains and losses will cancel each other over a period of years, but sizeable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below, along with a year-by-year comparative schedule.

	<b>Total</b>
(1) UAAL* at start of year	\$ 19,678,024
(2) Employer normal cost from last valuation	631,302
(3) Actual employer contributions	2,105,693
(4) Interest accrual: $[(1) + 1/2 [(2) - (3)] ] \times .075$	1,420,562
(5) Expected UAAL before changes: $(1) + (2) - (3) + (4)$	19,624,195
(6) Change from benefit provision application	-
(7) Change from revised actuarial assumptions	-
(8) Expected UAAL after changes: $(5) + (6) + (7)$	19,624,195
(9) Actual UAAL at end of year	21,170,774
(10) Gain (loss): $(8) - (9)$	(1,546,579)
(11) Actuarial accrued liability at start of the year	67,745,324
(12) Gain (loss) as percent of actuarial accrued liabilities at start of year	(2.3)%

\* *Unfunded Actuarial Accrued Liabilities.*

Valuation Date June 30,	Experience Gain (Loss) As % of Beginning Accrued Liability
	<u>Total</u>
2005	(0.9) %
2006	(0.7)
2007	2.3
2008	(1.2)
2009	(5.2)
2010	(2.1)
2011	(9.0)
2012	(8.5)
2013	(1.5)
2014	(2.3)

# Summary Statement of System Resources and Obligations

## PRESENT RESOURCES AND EXPECTED FUTURE RESOURCES

A. Present valuation assets:	
1. Net assets from System financial statements	\$ 49,685,203
2. Market value adjustment	(362,497)
3. Valuation assets	<u>49,322,706</u>
B. Actuarial present value of expected future employer contributions:	
1. For normal costs	5,796,234
2. For unfunded actuarial accrued liability	<u>21,170,774</u>
3. Total of (1) + (2)	26,967,008
C. Actuarial present value of expected future member contributions	4,528,213
D. Total present and expected future resources	<u>\$ 80,817,927</u>

## ACTUARIAL PRESENT VALUE OF EXPECTED FUTURE BENEFIT PAYMENTS

A. To retirees and beneficiaries	\$ 43,344,843
B. To vested terminated members	1,251,661
C. To present active members:	
1. Allocated to service rendered prior to valuation date - actuarial accrued liability	25,896,976
2. Allocated to service likely to be rendered after valuation date	<u>10,324,447</u>
3. Total	36,221,423
D. Total actuarial present value of expected future benefit payments	<u>\$ 80,817,927</u>

## Comments, Recommendation and Conclusion

**COMMENT A:** The overall actuarial experience was less favorable than anticipated as shown on page B-3. Recognized investment return rate of 7.5% matched the assumed 7.5%. Losses due to retired mortality, reserve transfers and low annuity withdrawal interest rates were greater than gains due to less than expected salary increases. Market performance from 2011 to 2014 was smoothed over 4 years by the Board's use of an asset smoothing technique. Unrecognized losses in investment return will put upward pressure on the City's contribution rate next year.

**COMMENT B:** This valuation does not include funding requirements for retiree health insurance (this is submitted in a separate report).

**COMMENT C:** A 30-year closed amortization period was used for this valuation. Historical funded ratios are shown on page B-6. As of June 30, 2014, the System's funded ratio was 70.0% compared to 71.0% as of June 30, 2013. On a market value basis the funded ratio would be 70.5% compared to 67.1% last year.

**COMMENT D:** The ratio of the Funding Value of Assets to the Market Value of Assets is 99.3%. Over time, this ratio is intended to stay near 100%. However, highly volatile markets can create distortions in this ratio. The System may wish to establish a "corridor" around the market value of assets such as 80% to 120%.

**COMMENT E:** The mortality table used to measure pre and post-retirement mortality in this valuation was the 1971 Group Annuity Mortality Table projected to 1984, set back 0 years for men and 6 years for women. The current table is out of date. Life expectancies continue to increase. The current preferred table for U.S. pension plans is the RP-2014 table. The RP-2014 table was originally constructed to reflect mortality improvements through the year 2014, but it also has projection scales to reflect mortality improvements after the year 2014. Since mortality rates continue to improve, we recommend projecting the table to 2015 to anticipate some future mortality improvement. The table below shows the results in this valuation had the mortality tables been updated to the RP-2014 Mortality Tables projected to 2015.

	Current Mortality Tables	RP-2014 Projected to 2015
<b>AAL</b>	\$70,493,480	\$75,507,079
<b>Funded Ratio</b>	70.0%	65.3%
<b>Contribution Rate</b>	27.94%	33.01%

**RECOMMENDATION:** We recommend that the board adopt the RP-2014 Mortality Tables projected to 2015 beginning with the 2015 valuation.

**CONCLUSION:** The City's contributions (member contributions are additional) to the City of Madison Heights Policemen and Firemen Retirement System, for the fiscal year beginning July 1, 2015, have been computed to be 27.94% of active member payroll for pensions with an additional 7.98% for administrative and investment expenses.

It is the actuary's opinion that the required contribution rates determined by the most recent actuarial valuation are sufficient to meet the System's funding objective, presuming continued timely receipt of required contributions.

# Comparative Statement

Valuation Date	Fiscal Year	Actuarial		Unfunded Actuarial Accrued Liabilities & Reserves			City's Contribution Rate		
		Accrued Liabilities & Reserves	Actuarial Accrued Assets	Funded Ratio	Amortiz.		Percents	Dollars	
					Dollars	% of Payroll		Recommended	Actual
1995 #	96-97	\$ 34,542,883	\$ 33,373,255	96.6 %	\$ 1,169,628	20	17.81 %	\$ 966,710	\$ 1,025,363
1996	97-98	36,147,252	35,924,274	99.4	222,978	19	17.01	892,281	948,377
1997	98-99	38,437,709	38,540,778	100.3	(103,069)	18	16.77	883,868	988,090
1998	99-00	40,087,394	41,907,540	104.5	(1,820,146)	17	14.25	750,633	909,016
1999 #	00-01	44,416,775	45,285,637	102.0	(868,862)	16	14.44	802,364	850,457
2000	01-02	46,244,023	47,689,403	103.1	(1,445,380)	15	13.45	727,203	845,881
2001	02-03	48,139,671	48,997,093	101.8	(857,422)	14	13.76	798,609	951,923
2002 #	03-04	50,633,078	49,200,870	97.2	1,432,208	13	17.31	1,113,946	1,221,459
2003 #	04-05	51,665,535	48,919,496	94.7	2,746,039	12	20.49	1,292,438	1,513,225
2004 *#	05-06	56,133,839	48,976,377	87.2	7,157,462	20	23.15	1,618,638	1,656,681
2005	06-07	57,733,862	49,887,362	86.4	7,846,500	19	23.86	1,697,809	1,794,618
2006 @	07-08	59,879,584	51,533,008	86.1	8,346,576	25	22.88	1,615,365	1,745,795
2007	08-09	61,959,805	55,004,366	88.8	6,955,439	25	21.90	1,581,304	1,625,338
2008 *	09-10	61,187,814	57,130,630	93.4	4,057,184	25	17.48	1,327,971	1,589,770
2009 @	10-11	63,175,083	56,156,781	88.9	7,018,302	30	18.82	1,411,463	1,391,859
2010	11-12	63,161,498	54,888,388	86.9	8,273,110	30	19.92	1,363,478	1,240,859
2011 #	12-13	65,466,348	51,374,542	78.5	14,091,806	30	22.72	1,365,401	1,757,601
2012	13-14	67,929,700	47,691,751	70.2	20,237,949	30	27.82	1,711,368	2,105,693
2013 **	14-15	67,745,324	48,067,300	71.0	19,678,024	30	24.99	1,588,802	
<b>2014</b>	<b>15-16</b>	<b>70,493,480</b>	<b>49,322,706</b>	<b>70.0</b>	<b>21,170,774</b>	<b>30</b>	<b>27.94</b>	<b>1,683,896</b>	

\* Revised actuarial assumptions. # Retirement System was amended. @ Amortization period was changed.  
 \*\* Changes in the application of the benefit provisions.

The Ratio of Valuation Assets to AAL is a traditional measure of a system's funding progress. Except in years when the system is amended or actuarial assumptions are revised, this ratio can be expected to increase gradually toward 100%.

The Ratio of UAAL to Valuation Payroll is another relative index of condition. Unfunded actuarial accrued liabilities represent debt, while active member payroll represents the system's capacity to collect contributions to pay toward debt. The lower the ratio, the greater the financial strength and vice-versa.

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## **SECTION C**

### **SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA**

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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## Brief Summary of Act 345 Benefit Provisions (June 30, 2014)

Eligibility	Amount
<b>SERVICE RETIREMENT</b>	
<b>Members hired after 7/1/2009 (excluding Dept. Heads)</b> Age 55 with 25 or more years of service or age 60 with 10 years of service.	Straight life pension equals 2.5% of 3-year Average Final Compensation (AFC) times 25 years of service plus 1.0% of AFC times years of service in excess of 25 years.
<b>Dept. Heads and Members hired before 7/1/2009</b> 25 or more years of service regardless of age or age 60 with 10 years of service.	Straight life pension equals 2.0% (2.8% if member has at least 25 years of service) of 3-year Average Final Compensation (AFC) times first 25 years of service plus 1.0% of AFC times years of service in excess of 25 years.
<b>DEFERRED RETIREMENT</b>	
10 or more years of service.	Computed as service retirement but based upon service, AFC and benefits in effect at termination. Benefit begins at date retirement would have occurred had member remained in employment.
<b>DEATH AFTER RETIREMENT SURVIVOR'S PENSION</b>	
Payable to a surviving spouse, if any, upon the death of a retired member who was receiving a straight life pension which was effective July 1, 1975 or later.	Spouse's pension equals 60% of the straight life pension the deceased retiree was receiving.
<b>NON-DUTY DEATH-IN-SERVICE SURVIVOR'S PENSION</b>	
Payable to a surviving spouse, if any, upon the death of a member with 20 or more years of service.	Accrued straight life pension actuarially reduced in accordance with an Option I election.

## **DUTY DEATH-IN-SERVICE SURVIVOR'S PENSION**

Payable upon the expiration of workers' compensation to the survivors of a member who died in the line of duty. Same amount that was paid by workers' compensation.

## **NON-DUTY DISABILITY**

Payable upon the total and permanent disability of a member with 5 or more years of service. To Age 55: 1.5% of AFC times years of service.  
At Age 55: Same as Service Retirement Pension.

## **DUTY DISABILITY**

Payable upon the total and permanent disability of a member in line of duty. To Age 55: 50% of AFC.  
At Age 55: Same as Service Retirement Pension with service credit from date of disability to age 55.

## **MEMBER CONTRIBUTIONS**

8.9% of pay for Firefighters  
8.9% of pay for Fire Command  
9.17% for Police  
9.17% for Police Command  
11.91% for Department Heads

Annuity withdrawal based on Merrill Lynch Bond Index available at retirement with 25 years of service.

Interest earned on Member Contributions is 3.5% annually effective July 1, 2011.

# **Retirees and Beneficiaries Added to and Removed from Rolls Comparative Statement**

Year Ended June 30	Added to Rolls		Removed from Rolls		Rolls End of Year			% Incr. in		Average Pension	Present Value of Pensions
	No.	Annual	No.	Annual	Active	No.	Per Retired	Annual Pensions	Annual Pensions		
		Pensions		Pensions							
1995	2	\$ 26,017	2	\$ 37,037	1.7	60	1.7	\$ 1,131,962	20.9 %	(1.0) %	\$ 12,420,297
1996	9	284,932	3	47,452	1.5	66	1.5	1,369,442	26.1	32.3	14,974,854
1997	9	378,255	1	37,802	1.3	74	1.3	1,709,895	32.4	24.9	18,742,035
1998	9	239,598	3	50,033	1.2	80	1.2	1,899,460	36.1	11.1	20,770,987
1999	11	350,221	4	71,463	1.1	87	1.1	2,178,218	37.5	14.7	24,146,654
2000	13	515,306	3	59,400	1.0	97	1.0	2,634,124	47.1	20.9	29,462,600
2001	5	233,147	1	34,484	0.9	101	0.9	2,832,787	48.8	7.5	31,482,029
2002	2	38,323	2	63,872	1.0	101	1.0	2,807,238	43.6	(0.9)	30,706,301
2003	3	122,791	2	15,098	1.0	102	1.0	2,914,931	46.2	3.8	31,583,764
2004	4	99,475	3	76,875	1.0	103	1.0	2,937,531	42.0	0.8	31,928,907
2005	1	23,232	3	79,834	1.0	101	1.0	2,880,929	40.5	(1.9)	30,919,712
2006	3	170,036	1	3,880	0.9	103	0.9	3,047,085	43.2	5.8	32,399,560
2007	2	93,031	4	83,266	0.9	101	0.9	3,056,850	42.3	0.3	32,176,238
2008	5	78,960	4	114,827	0.9	102	0.9	3,020,983	39.8	(1.2)	30,142,812
2009	3	82,044	1	25,502	0.9	104	0.9	3,077,525	41.0	1.9	30,340,870
2010	5	142,333	4	104,122	0.8	105	0.8	3,115,736	45.5	1.2	30,412,190
2011	12	634,045	2	32,757	0.7	115	0.7	3,717,024	61.9	19.3	37,300,027
2012	7	440,833	2	27,202	0.6	120	0.6	4,130,655	72.8	11.1	41,541,931
2013	4	195,238	4	148,883	0.6	120	0.6	4,177,010	71.2	1.1	41,555,510
2014	4	223,638	0	0	0.5	124	0.5	4,400,648	79.1	5.4	43,344,843

## Retirees and Beneficiaries as of June 30, 2014

### Tabulated by Type of Pensions Being Paid

Type of Pensions Being Paid	Number	Annual Pensions
Age and Service Pensions		
Regular pensions - benefit terminating at death of retiree	14	\$ 525,659
Regular pensions - automatic 60% to spouse	67	3,069,038
Regular pension - survivor	26	447,213
Option 1 pension	1	55,531
Option 2 pension - modified joint and survivor benefit	<u>0</u>	<u>0</u>
Total age and service pensions	108	\$ 4,097,441
Casualty Pensions		
Duty disability pensions	5	\$ 118,226
Non-duty disability pensions	3	81,717
Duty disability pension - survivor	4	39,072
Non-duty disability pension - survivor	0	0
Duty death pension - survivor	1	14,484
Non-duty death pensions - survivor	<u>3</u>	<u>49,708</u>
Total casualty pensions	<u>16</u>	<u>\$ 303,207</u>
<b>Total Pensions Being Paid</b>	<b>124</b>	<b>\$ 4,400,648</b>

## Retirees and Beneficiaries as of June 30, 2014

### Tabulated by Attained Ages

Attained Ages	No.	Annual Pensions
33	1	\$ 14,484
46	1	37,589
49	2	123,563
50	2	67,882
51	3	111,851
52	4	229,705
53	3	185,009
54	2	138,958
55	4	171,206
56	3	197,038
57	1	34,814
58	4	208,823
59	6	262,662
60	8	334,721
61	1	46,462
62	2	80,491
63	1	44,864
64	3	130,693
65	6	227,934
66	3	160,624
67	2	60,041
68	4	172,939
69	3	79,520
71	5	109,927
72	10	296,602
73	3	103,183
74	5	93,156
75	3	84,539
76	5	163,021
77	5	139,413
78	1	23,674
79	2	42,659
80	2	20,567
81	3	47,508
82	1	18,941
83	4	64,572
84	2	37,053
85	1	8,783
88	1	13,205
90	1	9,458
91	1	2,514
<b>Totals</b>	<b>124</b>	<b>\$ 4,400,648</b>

**Vested Terminated Members as of June 30, 2014\***  
**Tabulated by Attained Age**

<u>Attained Ages</u>	<u>No.</u>	<u>Estimated</u>
		<u>Annual Pensions</u>
32	1	\$ 30,664
35	1	23,125
42	1	23,876
45	1	36,997
56	1	47,928
<b>Totals</b>	<b>5</b>	<b>\$ 162,590</b>

*\* Members currently on leave of absence from service.*

## Active Members Included in Valuation by Division

Division	No.	Valuation Payroll	Average Pay
Police - Command	11	\$ 1,040,324	\$ 94,575
- Other	30	2,306,753	76,892
Fire - Command	7	620,199	88,600
- Other	17	1,273,938	74,938
Department Heads	3	320,518	106,839
<b>Totals</b>	<b>68</b>	<b>\$5,561,732</b>	<b>\$ 81,790</b>

## Active Members Added to and Removed from Rolls

Year Ended June 30	Number Added During Year		Terminations										Active Members End of Year
			Normal Retirement		Disabled		Died-in Service		Withdrawal				
									Vested	Other	Total		
	A	E	A	E	A	E	A	E	A	A	A	E	
1995	0	0	0	3.3	0	0.1	0	0.3	0	0	0	2	102
1996	4	7	6	3.1	1	0.2	0	0.2	0	0	0	1.1	99
1997	8	9	8	2.1	0	0.2	0	0.3	0	1	1	2.2	98
1998	8	8	5	1.8	1	0.2	0	0.2	0	2	2	1.2	98
1999	7	8	7	2.4	0	0.2	0	0.2	0	1	1	1.2	97
2000	8	11	11	1.0	0	0.2	0	0.1	0	0	0	1.0	94
2001	4	5	4	0.7	0	0.2	0	0.1	0	1	1	0.9	93
2002	6	0	0	0.2	0	0.2	0	0	0	0	0	1.0	99
2003	1	2	2	0.6	0	0.2	0	0.1	0	0	0	1.1	98
2004	1	1	1	1.0	0	0.2	0	0.0	0	0	0	1.1	98
2005	0	2	0	0.5	0	0.2	0	0.1	0	2	2	1.9	96
2006	1	3	3	0.4	0	0.3	0	0.1	0	0	0	1.6	94
2007	1	3	1	0.5	0	0.3	0	0.1	0	2	2	1.4	92
2008	0	0	0	0.4	0	0.3	0	0.1	0	0	0	1.3	92
2009	0	2	1	0.6	0	0.3	1	0.1	0	0	0	1.1	90
2010	0	8	1	0.6	1	0.4	0	0.2	0	6	6	1.0	82
2011	3	10	10	2.1	0	0.3	0	0.2	0	0	0	0.8	75
2012	4	9	7	1.5	0	0.3	0	0.2	2	0	2	0.7	70
2013	5	3	2	1.0	0	0.3	0	0.2	1	0	1	0.8	72
2014	2	6	4	3.0	0	0.3	0	0.1	0	2	2	1.3	68
5-Yr. Totals	14	36	24	8.2	1	1.6	0	0.9	3	8	11	4.6	
Expected for 2015				3.6		0.2		0.1				1.0	

A = actual

E = expected

## Active Members in Valuation Comparative Schedule

Valuation Date June 30	No.	Valuation Payroll	Average Pay	% Incr.	Age	Service
1995	102	\$ 5,427,906	\$ 53,215	11.2 %	40.9	14.6 yrs.
1996	99	5,245,624	52,986	4.3	40.5	14.1
1997	98	5,270,531	53,781	1.5	39.4	12.8
1998	98	5,267,598	53,751	0.0	38.8	12.2
1999	97	5,801,619	59,811	11.3	38.5	11.5
2000	94	5,593,871	59,509	(0.5)	36.9	9.9
2001	93	5,799,631	62,362	4.8	37.1	9.8
2002	99	6,435,274	65,003	4.2	37.5	10.2
2003	98	6,307,652	64,364	(1.0)	38.1	10.8
2004	98	6,991,955	71,346	10.8	38.8	11.6
2005	96	7,115,713	74,122	3.9	39.9	12.6
2006	94	7,060,160	75,108	1.3	40.2	13.0
2007	92	7,220,564	78,484	4.5	41.0	13.8
2008	92	7,597,087	82,577	5.2	42.0	14.8
2009	90	7,499,803	83,331	0.9	43.1	15.8
2010	82	6,844,767	83,473	0.2	44.1	16.8
2011	75	6,009,688	80,129	(4.0)	44.0	16.6
2012	70	5,676,851	81,098	1.2	43.8	16.2
2013	72	5,867,119	81,488	0.5	43.8	15.8
2014	68	5,561,732	81,790	0.4	44.2	16.3



# **Active Members as of June 30, 2014** **By Near Age and Years of Service**

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
25-29	4							4	\$ 190,574
30-34	2	1	1					4	252,513
35-39			2	3				5	430,339
40-44	2		5	14				21	1,728,154
45-49			3	4	11			18	1,610,950
50-54			1	3	8	1		13	1,104,425
55-59					1			1	76,104
60+					2			2	168,673
<b>Totals</b>	<b>8</b>	<b>1</b>	<b>12</b>	<b>24</b>	<b>22</b>	<b>1</b>		<b>68</b>	<b>\$ 5,561,732</b>

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 44.2 years.

Service: 16.3 years.

Annual Pay: \$ 81,790

# Summary of Current Asset Information Furnished for Valuation

## BALANCE SHEET

Current Assets (Market Value)		Reserve for	
Accrued Interest & Dividends	\$ 192,814	Employees' Contributions	\$ 8,071,001
Contributions Receivable	521,121	Employers' Contributions	13,667,010
Stocks	10,896,449	Retired Benefit Payments	27,947,192
Stock Mutual Funds	25,515,209		
U.S. Government Bonds	7,560,267		
Corporate Bonds	4,968,391		
Cash and Short Term Investments	30,952		
Accounts Payable	<u>0</u>		
Total Current Assets	<u>\$ 49,685,203</u>	Total Reserves *	<u>\$ 49,685,203</u>

\* As reported.

## RECEIPTS AND DISBURSEMENTS

	2013-14	2012-13
Balance - July 1,	\$ 45,451,011	\$ 45,299,336
Receipts:		
Employees' contributions	549,025	534,290
- for EE service purchase	30,780	N/A
Employer contributions	2,105,693	1,757,601
- for retiree health insurance	N/A	N/A
- for admin. & inv. expenses	N/A	N/A
Investment income	6,943,979	2,798,640
Disbursements:		
Benefit payments	4,311,787	4,153,843
Refund of member contributions	544,552	365,515
Retiree health insurance	95,232	N/A
Administrative & investment expenses	443,714	419,498
Audit Adjustment	0	0
Balance June 30,	<u>\$ 49,685,203</u>	<u>\$ 45,451,011</u>
Gross rate of investment return	15.7%	6.4%

## Development of Funding Value of Retirement System Assets

Year Ended June 30:	2012	2013	2014	2015	2016	2017
(A) Funding Value Beginning of Year	\$51,374,542	\$47,691,751	\$48,067,300			
(B) Market Value End of Year	45,299,336	45,451,011	49,685,203			
(C) Market Value Beginning of Year	50,159,010	45,299,336	45,451,011			
(D) Non Investment Net Cash Flow (EE+ER cont.)-(Ret. Ben.+Refunds +Health Ret. Ben.)	(3,325,863)	(2,227,467)	(2,266,073)			
(E) Investment Income:						
(E1) Market Total: B-C-D	(1,533,811)	2,379,142	6,500,265			
(E2) Assumed Rate	7.50%	7.50%	7.50%			
(E3) Amount for Immediate Recognition E2 * (A + D/2)	3,728,371	3,493,351	3,520,070			
(E4) Amount for Phased-In Recognition: E1-E3	(5,262,182)	(1,114,209)	2,980,195			
(F) Phased-In Recognition Investment Income:						
(F1) From Current Year = .25 x (E3)	(1,315,546)	(278,552)	745,049			
(F2) First Year Prior	850,458	(1,315,546)	(278,552)	\$ 745,049		
(F3) Second Year Prior	(146,697)	850,458	(1,315,546)	(278,552)	\$ 745,049	
(F4) Third Year Prior	(3,473,514)	(146,695)	850,458	(1,315,544)	(278,553)	\$ 745,048
(F5) Total Recognized Investment Gain	(4,085,299)	(890,335)	1,409	(849,047)	466,496	745,048
(G) Funding Value End of Year = (A) + (D) + (E3) + (F5)	\$47,691,751	\$48,067,300	\$49,322,706			
(H) Difference between Market & Funding Value	(2,392,415)	(2,616,289)	362,497			
(I) Recognized Rate of Return	-0.7%	5.6%	7.5%			
(J) Ratio of Funding Value of Assets to Market Value	105.3%	105.8%	99.3%			

The Funding Value of Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased-in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. The Funding Value of Assets is *unbiased* with respect to Market Value. At any time, it may be either greater or less than Market Value. If actual and assumed rates of investment income are exactly equal for 3 consecutive years, the Funding Value will become equal to Market Value.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

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## **SECTION D**

### **SUMMARY OF ACTUARIAL COST METHOD AND ASSUMPTIONS**

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	12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## Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an individual *entry-age normal cost* method having the following characteristics:

- (i) the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement;
- (ii) each annual normal cost is a constant percentage of the member's year-by-year projected covered pay.

**Financing of Unfunded Actuarial Accrued Liabilities.** Unfunded actuarial accrued liabilities (the portion of total liabilities not covered by present assets or expected future normal cost contributions) were amortized by level (principal or interest combined) percent-of-payroll contributions over a closed period of 30 years beginning July 1, 2015.

## **Actuarial Assumptions Used for the Valuations**

The actuary calculates the contribution requirements and benefit values of the System by applying actuarial assumptions to the benefit provisions and people information furnished, using the actuarial cost method described on the previous page.

The principal areas of financial risk which require assumptions about future experiences are:

- (i) Long-term rates of investment return to be generated by the assets of the System.
- (ii) Patterns of pay increases to members.
- (iii) Rates of mortality among members, retirees and beneficiaries.
- (iv) Rates of withdrawal of active members (without entitlement to a retirement benefit).
- (v) Rates of disability among members.
- (vi) The age patterns of actual retirement.

In making a valuation, the actuary calculates the monetary effect of each assumption for as long as a present covered person survives - - - a period of time which can be as long as a century.

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Actual experience of the System will not coincide exactly with assumed experience, regardless of the wisdom of the assumptions, or the skill of the actuary and the precision of the many calculations made. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations).



## Valuation Assumptions

The rate of investment return was 7.5% a year, compounded annually. This assumption is used to make money payable at one point in time equal in value to a different amount of money payable at another point in time.

This rate is not the assumed real return which, for funding purposes, is the rate of return in excess of average salary increases. Considering other assumptions used in the valuation, the 7.5% translates to a real return of approximately 2.0%. Experience over the last 5 years has been as illustrated below:

	Year Ending June 30,					5-Year Average
	2014	2013	2012	2011	2010	
1) Recognized rate*	7.5 %	5.6 %	(0.7) %	(0.7) %	(0.3) %	2.3 %
2) Increase in CPI	2.1	1.8	1.7	3.6	1.1	2.1
3) Average salary increase	1.1	4.4	4.7	(2.5)	(0.3)	1.5
4) Real return						
- investment purposes	5.4	3.8	(2.4)	(4.3)	(1.4)	0.2
- funding purposes	6.4	1.2	(5.4)	1.8	0.0	0.8

\* The recognized rate of return was computed using the approximate formula:  $i = I$  divided by  $1/2 (A+B-I)$ , where  $I$  is realized investment income,  $A$  is the beginning of year asset value and  $B$  is the end of year asset value.

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based.

Salary Increase Assumptions For an Individual Member			
Sample Ages	Merit & Seniority	Base (Economic)	Increase Next Year
20	3.0 %	5.5 %	8.5 %
25	3.0	5.5	8.5
30	2.6	5.5	8.1
35	1.1	5.5	6.6
40	0.2	5.5	5.7
45	0.2	5.5	5.7
50	0.2	5.5	5.7
55	0.1	5.5	5.6
60	0.0	5.5	5.5

If the number of active members remains constant, then the total active member payroll will increase 5.5% annually, the base portion of the individual salary increase assumptions. This increasing payroll was recognized in amortizing unfunded actuarial accrued liabilities.

The mortality table used to measure pre and post-retirement mortality was the 1971 Group Annuity Mortality Table projected to 1984, set back 0 years for men and 6 years for women. Disabled mortality rates are the standard post-retirement mortality rates set forward 10 years. No margin for future mortality improvements are included in these tables.

Sample Ages	Single Life Retirement Values			
	Present Value of \$1 Monthly for Life		Future Life Expectancy (Years)	
	Men	Women	Men	Women
45	\$142.21	\$149.34	32.01	37.64
50	134.71	143.55	27.53	32.93
55	125.72	136.32	23.28	28.40
60	114.86	127.65	19.27	24.11
65	102.12	117.20	15.55	20.05
70	88.28	104.80	12.25	16.27
75	74.58	91.07	9.49	12.87
80	60.87	77.36	7.17	10.02

This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. For purposes of the pre-retirement death benefit, it was assumed that 100% of members were married at the time of death. 25% of pre-retirement deaths were assumed to be duty related.

Probabilities of retirement for members eligible to retire were:

Hired Before July 1, 2009			Hired On or After July 1, 2009		
Retirement Ages	Percent of Active Members Retiring Within Next Year		Retirement Ages	Percent of Active Members Retiring Within Next Year	
	Police	Fire & Dept. Heads		Police	Fire & Dept. Heads
45	40 %	20 %	55	62.5 %	50 %
46	40	20	56	47.5	30
47	40	20	57	47.5	30
48	40	20	58	47.5	30
49	40	20	59	47.5	30
50	40	20	60	100.0	100
51	35	15			
52	20	10			
53	15	10			
54	15	10			
55	15	10			
56	15	10			
57	15	10			
58	15	10			
59	25	20			
60	100	100			

**Sample Rates of Separation From Active Employment Before Retirement, other than Death or Disability**

Sample Ages	Years of Service	% of Active Members Separating Within Next Year	
		Police	Fire & Dept. Heads
ALL	0	12.00 %	10.00 %
	1	9.00	7.00
	2	7.00	5.00
	3	5.00	4.00
	4	4.50	3.50
25	5 & Over	4.50	3.50
30		3.90	2.90
35		2.30	1.50
40		0.90	0.60
45		0.50	0.50
50		0.50	0.50
55		0.50	0.50
60		0.50	0.50

**Sample Rates of Disability**

Sample Ages	Probabilities of Becoming Disabled During Next Year	
	Men	Women
20	0.07 %	0.03 %
25	0.09	0.05
30	0.10	0.07
35	0.14	0.13
40	0.21	0.19
45	0.32	0.28
50	0.52	0.45
55	0.92	0.76
60	1.53	1.10

50% of disabilities were assumed to be duty related.

## **Summary of Assumptions Used June 30, 2014**

### **Pensions in an Inflationary Environment**

#### **Value of \$1,000/month Retirement Benefit To an Individual Who Retires at Age 50 In an Environment of 5.5% Wage Inflation**

<b>Age</b>	<b>Value</b>
50	\$ 1,000
51	948
52	898
53	852
54	807
55	765
60	585
65	448
70	343
75	262
80	201
85	154

## Miscellaneous and Technical Assumptions

**Marriage Assumption.** 100% of members are assumed to be married for purposes of death-in-service benefits. 90% of members are assumed to be married at time of retirement for purposes of death after retirement benefits.

**Pay Increase Timing.** Beginning of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

**Decrement Timing.** Decrements of all types are assumed to occur at the middle of the year.

**Eligibility Testing.** Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.

**Benefit Service.** Exact fractional service is used to determine the amount of benefit payable.

**Decrement Relativity.** Decrement rates are used directly from tabular rates, without adjustment for multiple decrement table effects.

**Decrement Operation.** Disability and mortality decrements do not operate during the first 5 years of service. Disability and separation do not operate during retirement eligibility.

**Normal Form of Benefit.** The assumed normal form of benefit is straight life for single members and joint and 60% survivor for married members.

**Loads.** Normal Retirement Present Values were loaded by 5% of age and service actuarial liabilities for Police and Fire hired before July 1, 2009 and 20% of age and service actuarial liabilities for Department Heads hired before July 1, 2009 for lump sums payable at retirement.

**Incidence of Contributions.** Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. New entrant normal cost contributions are applied to the funding of new entrant benefits.

**Annuity Withdrawal.** It was assumed that 80% of all future retirees will elect to withdraw their employee contributions at retirement resulting in a corresponding reduction to the monthly annuity. A 4% interest rate assumption was used to determine the annuity equivalent of the member contribution balance at retirement.

## Glossary

**Actuarial Accrued Liability.** The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

**Accrued Service.** The service credited under the plan which was rendered before the date of the actuarial valuation.

**Actuarial Assumptions.** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method.** A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

**Actuarial Equivalent.** A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

**Actuarial Present Value.** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Amortization.** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

**Experience Gain (Loss).** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

**Funding Value of Assets.** Also referred to as actuarial value of assets, smoothed market value of assets, or valuation assets.

Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased in over a closed 4-year period. During periods when investment performance exceeds the assumed rate, valuation assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, valuation assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, valuation assets will become equal to market value.

**Normal Cost.** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Plan Termination Liability.** The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for the future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

**Reserve Account.** An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

**Unfunded Actuarial Accrued Liability.** The difference between the actuarial accrued liability and the funding value of assets. Sometimes referred to as "unfunded accrued liability."

Most retirement systems have unfunded actuarial accrued liability. An amount arises each time new benefits are added and each time an experience loss occurs.

The existence of unfunded actuarial accrued liability is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liability does not represent a debt that is payable today. What is important is the ability to control the amount of unfunded actuarial accrued liability and the trend in the amount (after due allowance for devaluation of the dollar).

[illegible]



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## **SECTION E**

### **DISCLOSURES REQUIRED BY THE GOVERNMENTAL ACCOUNTING STANDARDS BOARD**

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**This information is presented for the final time in this report. Future valuation reports will not include GASB Statement No. 25 disclosures. Additional plan disclosures under the new GASB Statement No. 67 are issued in a separate report.**

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# **Statement of Plan Net Assets** **as of June 30, 2014**

	<u>2014</u>	<u>2013</u>
Cash and short-term investments	\$ 30,952	\$ 1,191,850
Receivables		
Contributions	521,121	435,716
Accrued interest and dividends	<u>192,814</u>	<u>190,379</u>
Total receivables	713,935	626,095
Investments, at fair value		
U.S. Government bonds	7,560,267	9,109,726
Corporate bonds	4,968,391	6,597,108
Stocks	10,896,449	9,909,691
Stock mutual funds	<u>25,515,209</u>	<u>18,016,541</u>
Total investments	<u>48,940,316</u>	<u>43,633,066</u>
Total assets	<u><u>\$49,685,203</u></u>	<u><u>\$45,451,011</u></u>

**Statement of Changes in Plan Net Assets**  
**Fiscal Year Ended**  
**June 30, 2014**

	2014		
	Pension	Administration Expenses	Total
Additions:			
Contributions			
Employer	\$ 2,105,693	N/A	\$ 2,105,693
Plan Members	579,805		579,805
Total	\$ 2,685,498	\$ -	2,685,498
Investment Income #			6,500,265
Total Additions			\$ 9,185,763
Deductions:			
Benefits Paid	\$ 4,311,787		\$ 4,311,787
Refund of Contributions	544,552		544,552
Health Premiums	95,232		95,232
Total Deductions	\$ 4,951,571		\$ 4,951,571
Net Increase			\$ 4,234,192
Net Assets Held in Trust Fund at Fair Value:			
Beginning of Year			\$ 45,451,011
End of Year			\$ 49,685,203

# Net of expenses.

## Plan Contributions Pension Only

**Plan Description.** The City of Madison Heights Policemen and Firemen Retirement System is a single-employer Act 345 defined benefit pension plan that covers Public Safety Officers of Madison Heights, Michigan.

The plan provides retirement, disability, and death benefits to plan members and their beneficiaries.

**Contributions.** Plan members contribute 8.90% of pay for Firefighters; 8.90% for Fire Command; 9.17% for Police Command; 9.17% of pay for Police and 11.91% of pay for Department Heads.

The employer's funding policy provides for periodic employer contributions based upon a *fundamental financial objective of having rates of contribution which remain relatively level from generation to generation of Madison Heights citizens*. To determine the employer contribution rates and to assess the extent to which the fundamental financial objective is being achieved, the System has actuarial valuations prepared annually. In preparing those valuations, the individual entry-age actuarial cost method is used to determine normal cost and actuarial accrued liabilities.

Unfunded actuarial accrued liabilities (full funding credit) are amortized by level percent-of-payroll contributions over a closed period of 30 future years.

On the basis of the June 30, 2014 and 2013 actuarial valuations, the employer rates were determined to be as follows:

Contributions for Fiscal Year Ending June 30,	Percents of Total Active Member Payroll (Weighted Average)	
	2016	2015
Normal Cost	11.79 %	10.76 %
Unfunded Actuarial Accrued Liabilities	16.15	14.23
Retiree Health Care	N/A	N/A
Expenses	<u>7.98</u>	<u>7.15</u>
Total Employer Rate excluding Retiree Health Care	35.92 %	32.14 %

## Required Supplementary Information

### Schedule of Funding Progress Pension Only (Dollar amounts in millions)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a Percent of Covered Payroll (b) - (a) / (c)
6/30/2000	\$47.69	\$46.24	(1.45) %	103.1 %	\$5.59	(25.8) %
6/30/2001	49.00	48.14	(0.86)	101.8	5.80	(14.8)
6/30/2002 *	49.20	50.63	1.43	97.2	6.44	22.2
6/30/2003 *	48.92	51.67	2.75	94.7	6.31	43.5
6/30/2004 *	48.98	56.13	7.16	87.2	6.99	102.4
6/30/2005	49.89	57.73	7.85	86.4	7.12	110.3
6/30/2006	51.53	59.88	8.35	86.1	7.06	118.2
6/30/2007	55.00	61.96	6.96	88.8	7.22	96.3
6/30/2008 *	57.13	61.19	4.06	93.4	7.60	53.4
6/30/2009 *	56.16	63.18	7.02	88.9	7.50	93.6
6/30/2010	54.89	63.16	8.27	86.9	6.84	120.9
6/30/2011 *	51.37	65.47	14.09	78.5	6.01	234.5
6/30/2012	47.69	67.93	20.24	70.2	5.68	356.5
6/30/2013 #	48.07	67.75	19.68	71.0	5.87	335.4
6/30/2014	49.32	70.49	21.17	70.0	5.56	380.7

# Changes in the application of the benefit provisions.

\* After changes in benefit provisions and/or assumptions/methods.

### Schedule of Employer Contributions Pension Only

Year Ended June 30,	Annual Required Contributions	Actual Employer Contributions#	Percentage Contributed
2000	\$ 909,016	\$ 909,016	100 %
2001	850,457	850,457	100
2002	845,881	845,881	100
2003	951,923	951,923	100
2004	1,221,459	1,221,459	100
2005	1,513,225	1,513,225	100
2006	1,656,681	1,656,681	100
2007	1,794,618	1,794,618	100
2008	1,745,795	1,745,795	100
2009	1,625,338	1,625,338	100
2010	1,589,770	1,589,770	100
2011	1,391,859	1,391,859	100
2012	1,240,859	1,240,859	100
2013	1,757,601	1,757,601	100
2014	2,105,693	2,105,693	100

# Excludes contributions made for expenses and retiree health care.

## Summary of Actuarial Methods and Assumptions

The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	June 30, 2014
Actuarial cost method	Individual entry-age actuarial cost method
Amortization method	Level percent-of-payroll
Amortization period	30 years closed
Asset valuation method	4-year smoothed market
Actuarial assumptions:	
Investment rate of return	7.50%
Projected salary increases	5.5% - 8.5%
Assumed rate of payroll growth	5.50%
Assumed rate of membership growth	0%
Cost-of-living adjustments	None

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	