

Houston Firefighters' Relief and Retirement Fund

Actuarial Valuation Report

Plan Year

As of July 1, 2016

May 2017

Summary of Key Results (\$000)

	July 1, 2016	July 1, 2016	July 1, 2015
	Based upon 7.25% rate	Based upon 8.5% rate, before valuation rate assumption change	Based upon 8.5% rate
Actuarial Contribution Rate			
Normal Cost (City Portion)	27.9%	19.8%	19.5%
Amortization of Unfunded			
Actuarial Accrued Liability (Surplus)	20.6%	11.6%	11.3%
Additional Statutory Requirement	<u>0</u>	<u>0</u>	<u>0</u>
City's Actuarial Contribution Rate	48.5%	31.4%	30.8%
Employee Contribution Rate	9.0%	9.0%	9.0%
Summary of Assets			
Market Value	\$ 3,729,670	\$ 3,729,670	\$ 3,877,651
Rate of Return	-1.2%	-1.2%	1.3%
Actuarial Value ¹	\$ 4,089,047	\$ 4,089,047	\$ 3,929,988
Rate of Return	6.7%	6.7%	9.3%
Summary of Liabilities			
Actuarial Accrued Liability	\$ 5,073,523	\$ 4,569,569	\$ 4,397,007
Actuarial Value of Assets	<u>\$ (4,089,047)</u>	<u>\$ (4,089,047)</u>	<u>\$ (3,929,988)</u>
Unfunded Actuarial Accrued Liability	\$ 984,476	\$ 480,522	\$ 467,019
Funded Ratio	80.6%	89.5%	89.4%
Summary of Data			
Number of Participants Included in the Valuation			
Active Participants	3,321	3,321	3,142
DROP Participants	773	773	796
Retirees and beneficiaries	3,138	3,138	3,060
Vested terminated participants	<u>43</u>	<u>43</u>	<u>23</u>
Total	7,275	7,275	7,021
Projected Annual Payroll			
Active Participants	\$ 227,862	\$ 227,862	\$ 221,668
DROP Participants	<u>68,916</u>	<u>68,916</u>	<u>70,821</u>
Total	\$ 296,778	\$ 296,778	\$ 292,489

¹ Past gains and losses were fully recognized in the Actuarial Value of Assets at July 1, 2013.

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Section 1: Asset Information

Summary of Market Value of Assets (\$000)

Investment Category	July 1, 2016		July 1, 2015		July 1, 2014	
	Amount	Percentage	Amount	Percentage	Amount	Percentage
Cash & Short Term Investments	\$ 228,539	6.2%	\$ 163,566	4.2%	\$ 127,736	2.6%
Fixed Income Investments	1,138,667	30.5%	1,216,922	31.4%	1,220,890	34.6%
Equity Securities	1,357,842	36.4%	1,503,799	38.8%	1,557,858	36.2%
Other Assets						
Alternative Investments - Partnerships	795,039	21.3%	808,707	20.9%	812,356	19.5%
Real Estate	186,825	5.0%	171,053	4.4%	195,472	6.6%
Land, building, etc.	5,724	0.2%	5,659	0.1%	5,950	0.2%
Other Net Assets, Receivables & Payables						
Accrued Interest & Dividends	11,928	0.3%	16,984	0.4%	16,457	0.5%
Accrued City Contributions	3,434	0.1%	2,828	0.1%	2,474	0.0%
Accrued Member Contributions	927	0.0%	769	0.0%	671	0.0%
Net Other	745	0.0%	(12,636)	(0.3)%	(27,039)	(0.2)%
Total Market Value of Assets	\$ 3,729,670	100.0%	\$ 3,877,651	100.0%	\$ 3,912,825	100.0%

Change in Market Value of Assets

	Fiscal Year End June 30, 2016	Fiscal Year End June 30, 2015
Beginning of Year Market Value	\$ 3,877,650,516	\$ 3,912,825,278
Increases Due to:		
a. Contributions:		
i. City	\$ 94,279,235	\$ 92,609,565
ii. Members	<u>25,510,801</u>	<u>25,091,582</u>
iii. Total	\$ 119,790,036	\$ 117,701,147
b. Investment Income	<u>\$ (47,437,117)</u>	<u>\$ 51,802,139</u>
c. Total Increases	\$ 72,352,919	\$ 169,503,286
Decreases Due to:		
a. Benefit Payments	\$ 211,127,901	\$ 195,493,351
b. Refund of Member Contributions	544,717	868,618
c. Administrative Expenses	6,771,158	6,640,148
d. Professional Services	<u>1,889,650</u>	<u>1,675,931</u>
e. Total Decreases	\$ 220,333,426	\$ 204,678,048
End of Year Market Value	\$ 3,729,670,009	\$ 3,877,650,516

Development of the Actuarial Value of Assets (\$000)

Actuarial Investment Gain (Loss)

	Fiscal Year End June 30, 2016	Fiscal Year End June 30, 2015
Market Value of Assets at beginning of year	\$ 3,877,651	\$ 3,912,825
Net Cash Flow		
a. Contributions	\$ 119,790	\$ 117,701
b. Disbursements	<u>211,673</u>	<u>196,362</u>
c. Net Cash Flow [2.a. - 2.b.]	\$ (91,883)	\$ (78,661)
Expected Investment Return[1. x .085] + [2.c. x .0425]	\$ 325,695	\$ 329,247
Expected Market Value of Assets at end of year [1. + 2.c. + 3.]	\$ 4,111,463	\$ 4,163,411
Market Value of Assets at end of year	\$ 3,729,670	\$ 3,877,651
Investment Gain / (Loss) [5. - 4.]	\$ (381,793)	\$ (285,760)

Schedule of Actuarial Investment Gains (Losses)

Plan Year Ending	Initial Actuarial Gain (Loss)	Five-Year Recognition	Gain (Loss) ¹ As of July 1, 2016
July 1, 2016	\$ (381,793)	\$ (76,359)	\$ (305,434)
July 1, 2015	\$ (285,760)	\$ (57,152)	\$ (171,457)
July 1, 2014	\$ 293,785	\$ 58,757	\$ 117,514

Actuarial Value of Assets

Market Value as of July 1, 2016	\$ 3,729,670
(Gain) Loss to be Recognized in Future Years	\$ 359,377
Actuarial Value as of July 1, 2016	\$ 4,089,047

¹ Past gains and losses were fully recognized in the Actuarial Value of Assets at July 1, 2013. For 2013, the Actuarial Value of Assets is equal to the Market Value of Assets. Starting in July 1, 2014, assets gains and losses are deferred for recognition in future years.

Section II: Basic Valuation Results

Unfunded Actuarial Accrued Liability (\$000)

	July 1, 2016 Based upon 7.25% rate	July 1, 2016 Based upon 8.5% rate, before valuation rate assumption change	July 1, 2015 Based upon 8.5% rate
Actuarial Present Value of:			
Future Benefits			
Active	\$ 1,893,138	\$ 1,434,587	\$ 1,380,606
DROP	1,210,689	1,085,143	1,079,558
Deferred Vested	1,819	1,567	1,869
Retired	<u>3,108,041</u>	<u>2,853,759</u>	<u>2,711,549</u>
Total for All Participants	\$ 6,213,687	\$ 5,375,056	\$ 5,173,582
Future Employee Contributions	\$ 265,349	\$ 240,815	\$ 235,139
Future Normal Cost - City Portion	\$ 874,815	\$ 564,672	\$ 541,436
Actuarial Accrued Liability	\$ 5,073,523	\$ 4,569,569	\$ 4,397,007
Actuarial Value of Assets	\$ (4,089,047)	\$ (4,089,047)	\$ (3,929,988)
Unfunded Actuarial Accrued Liability	\$ 984,476	\$ 480,522	\$ 467,019
Total Normal Cost (BOY)	\$ 105,570	\$ 81,887	\$ 79,670

Change in Key Results since the Prior Valuation (\$000)

Analysis of Change in Unfunded Liability	2015/2016
A. Unfunded at Beginning of Period	\$ 467,019
B. Estimated Change Due to Normal Operation	
Normal Cost	\$ 79,670
Contributions	(119,790)
Interest	<u>41,377</u>
Net Change	\$ 1,257
C. Estimated Change due to Actuarial Experience	
Actuarial (gain) loss from asset sources	\$ 79,202
Actuarial (gain) loss from liability sources	<u>(70,921)</u>
Net change	\$ 8,281
D. Change due to Update in Mortality Table	\$ 3,965
E. Change due to Change in Discount Rate	\$ 503,954
F. Unfunded Actuarial Accrued Liability at End of Period	\$ 984,476

Analysis of Change in Actuarial Asset Value	2015/2016
A. Value at Beginning of Period	\$ 3,929,988
B. Contributions	\$ 119,790
C. Distributions	\$ (211,673)
D. Expected Investment Return at 8.5%	\$ 330,144
E. Expected Value at End of Period	\$ 4,168,249
F. Actual Actuarial Asset Value	\$ 4,089,047
G. Actuarial Gain (Loss) Due to Asset Sources	\$ (79,202)

Analysis of Change in Actuarial Accrued Liability	2015/2016
A. Actuarial Accrued Liability at Beginning of Period	\$ 4,397,007
B. Increase Due to Normal Cost	\$ 79,670
C. Decrease Due to Distributions	\$ (211,673)
D. Interest and Other	\$ 371,521
E. Expected Actuarial Accrued Liability at End of Period	\$ 4,636,525
F. Actuarial Loss (Gain) from Liability Sources	\$ (70,921)
G. Change due to Change in Mortality Table	\$ 3,965
H. Change due to Change in Discount Rate	\$ 503,954
H. Actuarial Accrued Liability	\$ 5,073,523

Section III: Contribution Rate

Actuarially Determined City Contribution Rates

	July 1, 2016 Based upon 7.25% rate	July 1, 2016 Based upon 8.5% rate, before valuation rate assumption change	July 1, 2015 Based upon 8.5% rate
Normal Cost (City Portion)	27.9%	19.8%	19.5%
Amortization of Unfunded Actuarial Accrued Liability (Surplus)	20.6%	11.6%	11.3%
Additional Statutory Requirement	<u>0.0%</u>	<u>0.0%</u>	<u>0.0%</u>
City's Contribution Rate	48.5%	31.4%	30.8%
Employee Contribution Rate	9.0%	9.0%	9.0%

Analysis of Actual Contribution Rates	Contribution Rate	
	City	Employee
Fiscal Year 2009	29.4%	9.0%
Fiscal Year 2010	29.4%	9.0%
Fiscal Year 2011	29.4%	9.0%
Fiscal Year 2012	23.9%	9.0%
Fiscal Year 2013	23.9%	9.0%
Fiscal Year 2014	23.9%	9.0%
Fiscal Year 2015	33.2%	9.0%
Fiscal Year 2016	33.2%	9.0%

Historical City Contributions as a Percentage of Covered Payroll

Actuarially Calculated City Contribution Rate ¹		Actual City Contribution Rate	
Valuation Date	Rate	Period	Rate
July 1, 1987	13.0%	July 1, 1988 through June 30, 1989	15.0%
July 1, 1988	13.3	July 1, 1989 through June 30, 1990	15.0
July 1, 1989	12.9	July 1, 1990 through June 30, 1991	15.0
July 1, 1990	13.2	July 1, 1991 through June 30, 1992	15.0
July 1, 1991	15.4	July 1, 1992 through June 30, 1993	15.0 ²
July 1, 1992	15.3	July 1, 1993 through June 30, 1994	15.3
July 1, 1993	15.6	July 1, 1994 through June 30, 1995	15.0
July 1, 1994	14.9	July 1, 1995 through June 30, 1996	15.0
July 1, 1995	13.4 ³	July 1, 1996 through June 30, 1997	15.4
July 1, 1996	14.1 ³	July 1, 1997 through June 30, 1998	15.4
July 1, 1997	14.9 ³	July 1, 1998 through June 30, 1999	15.4
July 1, 1998	11.5	July 1, 1999 through June 30, 2000	15.4
July 1, 1999	11.0	July 1, 2000 through June 30, 2001	15.4
July 1, 2000	9.9 ³	July 1, 2001 through June 30, 2002	15.4
July 1, 2001	14.9 ³	July 1, 2002 through June 30, 2003	15.4
July 1, 2002	23.8	July 1, 2003 through June 30, 2004	16.5 ³
July 1, 2003	N/A ⁴	July 1, 2004 through June 30, 2005	18.0
July 1, 2004	31.1	July 1, 2005 through June 30, 2006	23.8
July 1, 2005	33.5	July 1, 2006 through June 30, 2007	23.8
July 1, 2006	32.7	July 1, 2007 through June 30, 2008	23.8
July 1, 2007	29.4	July 1, 2008 through June 30, 2009	29.4
July 1, 2008	24.1	July 1, 2009 through June 30, 2010	29.4
July 1, 2009	23.8	July 1, 2010 through June 30, 2011	29.4
July 1, 2010	23.9	July 1, 2011 through June 30, 2012	23.9
July 1, 2011	26.9	July 1, 2012 through June 30, 2013	23.9
July 1, 2012	31.1	July 1, 2013 through June 30, 2014	23.9
July 1, 2013	33.2	July 1, 2014 through June 30, 2015	33.2
July 1, 2014	N/A ⁴	July 1, 2015 through June 30, 2016	33.2
July 1, 2015	30.8	July 1, 2016 through June 30, 2017	33.2
July 1, 2016	48.5	July 1, 2017 through June 30, 2018	TBD

¹ Before application of statutory minimum contribution.

² Excluding additional contribution due to settlement of lawsuit.

³ Average for the year.

⁴ No valuation performed.

Section IV: Valuation Forecast

Projection of Estimated Assets and Liabilities (\$000)¹

Fiscal Year	Annual Payroll	Estimated Contributions			Benefit Payments	Market Value of Assets (BOY)	Market Return	Actuarial Value of Assets (BOY)	Actuarial Liability (BOY)	Unfunded Liability Amount (BOY)	Funded Percent (BOY)
		City Amount	City Percent	Actuarially Determined Rate							
2017	\$ 296,778	\$ 98,530	33.2%	48.5%	\$ 272,806	\$ 3,729,670	7.25%	\$ 4,089,047	\$ 5,073,523	\$ 984,476	81%
2018	305,681	148,255	48.5%	51.4%	300,344	\$ 3,847,156	7.25%	\$ 4,131,779	\$ 5,268,854	1,137,075	78%
2019	314,852	161,834	51.4%	53.4%	326,583	\$ 3,996,982	7.25%	\$ 4,206,851	\$ 5,452,976	1,246,125	77%
2020	324,297	173,175	53.4%	56.4%	347,693	\$ 4,145,406	7.25%	\$ 4,221,764	\$ 5,626,508	1,404,744	75%
2021	334,026	188,391	56.4%	58.1%	372,074	\$ 4,295,348	7.25%	\$ 4,295,348	\$ 5,794,083	1,498,735	74%
2022	344,047	199,891	58.1%	58.1%	396,800	\$ 4,447,571	7.25%	\$ 4,447,571	\$ 5,951,969	1,504,398	75%
2023	354,368	205,888	58.1%	57.9%	421,439	\$ 4,598,060	7.25%	\$ 4,598,060	\$ 6,099,196	1,501,136	75%
2024	365,000	211,335	57.9%	57.7%	449,202	\$ 4,741,104	7.25%	\$ 4,741,104	\$ 6,235,173	1,494,069	76%
2025	375,949	216,923	57.7%	57.4%	474,831	\$ 4,872,385	7.25%	\$ 4,872,385	\$ 6,355,942	1,483,557	77%
2026	387,228	222,269	57.4%	57.2%	509,679	\$ 4,993,437	7.25%	\$ 4,993,437	\$ 6,462,707	1,469,270	77%
2027	398,845	228,139	57.2%	57.0%	351,680	\$ 5,093,746	7.25%	\$ 5,093,746	\$ 6,544,997	1,451,251	78%
2028	410,810	234,162	57.0%	56.9%	363,831	\$ 5,372,221	7.25%	\$ 5,372,221	\$ 6,807,589	1,435,368	79%
2029	423,134	240,764	56.9%	56.7%	378,587	\$ 5,665,651	7.25%	\$ 5,665,651	\$ 7,081,204	1,415,553	80%
2030	435,828	247,115	56.7%	56.6%	396,267	\$ 5,973,053	7.25%	\$ 5,973,053	\$ 7,364,077	1,391,024	81%
2031	448,903	254,079	56.6%	56.5%	415,653	\$ 6,292,187	7.25%	\$ 6,292,187	\$ 7,653,991	1,361,804	82%
2032	462,370	261,239	56.5%	56.4%	422,859	\$ 6,622,806	7.25%	\$ 6,622,806	\$ 7,949,835	1,327,029	83%
2033	476,242	268,600	56.4%	56.2%	437,009	\$ 6,978,603	7.25%	\$ 6,978,603	\$ 8,264,810	1,286,207	84%
2034	490,529	275,677	56.2%	56.0%	454,185	\$ 7,354,453	7.25%	\$ 7,354,453	\$ 8,593,261	1,238,808	86%
2035	505,245	282,937	56.0%	55.9%	477,643	\$ 7,748,420	7.25%	\$ 7,748,420	\$ 8,933,190	1,184,770	87%
2036	520,402	290,905	55.9%	55.7%	501,931	\$ 8,155,537	7.25%	\$ 8,155,537	\$ 9,279,082	1,123,545	88%
2037	536,014	298,560	55.7%	55.5%	525,098	\$ 8,576,672	7.25%	\$ 8,576,672	\$ 9,630,679	1,054,007	89%
2038	552,095	306,412	55.5%	55.3%	548,880	\$ 9,013,720	7.25%	\$ 9,013,720	\$ 9,989,730	976,010	90%
2039	568,657	314,468	55.3%	55.1%	570,906	\$ 9,467,447	7.25%	\$ 9,467,447	\$ 10,356,316	888,869	91%
2040	585,717	322,730	55.1%	54.8%	595,532	\$ 9,941,137	7.25%	\$ 9,941,137	\$ 10,732,989	791,852	93%
2041	603,289	330,602	54.8%	54.4%	616,719	\$ 10,433,804	7.25%	\$ 10,433,804	\$ 11,117,975	684,171	94%
2042	621,387	338,035	54.4%	54.0%	638,861	\$ 10,950,031	7.25%	\$ 10,950,031	\$ 11,515,636	565,605	95%
2043	640,029	345,616	54.0%	53.5%	659,483	\$ 11,490,129	7.25%	\$ 11,490,129	\$ 11,926,104	435,975	96%
2044	659,230	352,688	53.5%	52.5%	677,775	\$ 12,057,609	7.25%	\$ 12,057,609	\$ 12,352,089	294,480	98%
2045	679,007	356,478	52.5%	50.3%	694,719	\$ 12,656,395	7.25%	\$ 12,656,395	\$ 12,797,345	140,950	99%
2046	699,377	351,787	50.3%	27.9%	708,072	\$ 13,286,808	7.25%	\$ 13,286,808	\$ 13,264,886	(21,922)	100%

¹ The projections shown on this page assume:
 Assets will return 7.25% in all future years (i.e. no gains or losses).
 Contributions will be made as anticipated in the "City Percent" column above.
 Payroll will increase at 3% annually.

Section V: Participant Information

Participant Data Reconciliation

	Active	DROP	Deferred Vested	Retired	Total
Number of members as of July 1, 2015	3,142	796	23	3,060	7,021
Change in status during the plan year:					
Actives who retired	(2)	(91)		93	0
Actives who terminated	(29)		29		0
Actives who entered DROP	(71)	71			0
Inactives who retired			(2)	2	0
Participants who became disabled	(3)	(1)		4	0
No longer members due to:					
Death	(1)	(2)		(53)	(56)
Non-vested terminations					0
Child attained cut-off age				(7)	(7)
Benefits no longer due	(15)		(7)		(22)
New member due to:					
Initial membership	300				300
Death of another member				37	37
Correction				2	2
Number of members as of July 1, 2016	3,321	773	43	3,138	7,275

Summary of Active Participants as of July 1, 2016

Attained Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	Total
Under 25	41	55	-	-	-	-	-	-	-	-	96
Avg. Pay	11,938	46,576	-	-	-	-	-	-	-	-	31,783
25 to 29	72	328	68	-	-	-	-	-	-	-	468
Avg. Pay	8,821	51,992	64,878	-	-	-	-	-	-	-	47,223
30 to 34	48	274	315	110	-	-	-	-	-	-	747
Avg. Pay	10,244	51,531	66,794	75,827	-	-	-	-	-	-	58,892
35 to 39	13	73	207	484	45	-	-	-	-	-	822
Avg. Pay	10,270	52,820	66,433	74,871	79,220	-	-	-	-	-	70,004
40 to 44	-	2	81	342	198	38	-	-	-	-	661
Avg. Pay	-	62,542	65,927	73,398	84,982	88,653	-	-	-	-	76,797
45 to 49	-	-	1	154	212	53	5	-	-	-	425
Avg. Pay	-	-	74,679	74,315	84,452	97,324	113,950	-	-	-	82,708
50 to 54	-	-	-	4	76	14	4	-	-	-	98
Avg. Pay	-	-	-	69,576	84,655	83,990	97,629	-	-	-	84,474
55 to 59	-	-	-	-	-	3	1	-	-	-	4
Avg. Pay	-	-	-	-	-	90,297	75,190	-	-	-	86,520
60 to 64	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
65 to 69	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
70 & up	-	-	-	-	-	-	-	-	-	-	-
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-
Total	174	732	672	1,094	531	108	10	-	-	-	3,321
Avg. Pay	10,056	51,524	66,396	74,409	84,235	92,349	103,545	-	-	-	66,614
Average Age:				37.14		Average Service:				9.7	

Summary of DROP Participants as of July 1, 2016

Attained Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	Total				
Under 25	-	-	-	-	-	-	-	-	-	-	-				
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-				
25 to 29	-	-	-	-	-	-	-	-	-	-	-				
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-				
30 to 34	-	-	-	-	-	-	-	-	-	-	-				
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-				
35 to 39	-	-	-	-	-	-	-	-	-	-	-				
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-				
40 to 44	-	-	-	-	-	14	1	-	-	-	15				
Avg. Pay	-	-	-	-	-	89,722	96,497	-	-	-	90,173				
45 to 49	-	-	-	-	-	104	72	2	-	-	178				
Avg. Pay	-	-	-	-	-	84,013	90,047	115,910	-	-	86,812				
50 to 54	-	-	-	-	-	82	110	77	1	-	270				
Avg. Pay	-	-	-	-	-	83,749	86,977	88,123	76,279	-	86,284				
55 to 59	-	-	-	-	-	29	56	131	59	-	275				
Avg. Pay	-	-	-	-	-	82,053	83,166	88,230	89,611	-	86,844				
60 to 64	-	-	-	-	-	-	-	14	17	2	33				
Avg. Pay	-	-	-	-	-	-	-	81,223	85,914	74,675	83,243				
65 to 69	-	-	-	-	-	-	-	-	-	2	2				
Avg. Pay	-	-	-	-	-	-	-	-	-	89,095	89,095				
70 & up	-	-	-	-	-	-	-	-	-	-	-				
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-				
Total	-	-	-	-	-	229	239	224	77	4	773				
Avg. Pay	-	-	-	-	-	84,019	87,049	88,003	88,622	81,885	86,558				
Average Age:				53.37				Average Service:				28.32			

Summary of Active and DROP Participants as of July 1, 2016

Attained Age	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	Total	
Under 25	41	55	-	-	-	-	-	-	-	-	96	
Avg. Pay	11,938	46,576	-	-	-	-	-	-	-	-	31,783	
25 to 29	72	328	68	-	-	-	-	-	-	-	468	
Avg. Pay	8,821	51,992	64,878	-	-	-	-	-	-	-	47,223	
30 to 34	48	274	315	110	-	-	-	-	-	-	747	
Avg. Pay	10,244	51,531	66,794	75,827	-	-	-	-	-	-	58,892	
35 to 39	13	73	207	484	45	-	-	-	-	-	822	
Avg. Pay	10,270	52,820	66,433	74,871	79,220	-	-	-	-	-	70,004	
40 to 44	-	2	81	342	198	52	1	-	-	-	676	
Avg. Pay	-	62,542	65,927	73,398	84,982	88,941	96,497	-	-	-	77,094	
45 to 49	-	-	1	154	212	157	77	2	-	-	603	
Avg. Pay	-	-	74,679	74,315	84,452	88,507	91,599	115,910	-	-	83,919	
50 to 54	-	-	-	4	76	96	114	77	1	-	368	
Avg. Pay	-	-	-	69,576	84,655	83,784	87,351	88,123	76,279	-	85,802	
55 to 59	-	-	-	-	-	32	57	131	59	-	279	
Avg. Pay	-	-	-	-	-	82,826	83,026	88,230	89,611	-	86,839	
60 to 64	-	-	-	-	-	-	-	14	17	2	33	
Avg. Pay	-	-	-	-	-	-	-	81,223	85,914	74,675	83,243	
65 to 69	-	-	-	-	-	-	-	-	-	2	2	
Avg. Pay	-	-	-	-	-	-	-	-	-	89,095	89,095	
70 & up	-	-	-	-	-	-	-	-	-	-	-	
Avg. Pay	-	-	-	-	-	-	-	-	-	-	-	
Total	174	732	672	1,094	531	337	249	224	77	4	4,094	
Avg. Pay	10,056	51,524	66,396	74,409	84,235	86,689	87,711	88,003	88,622	81,885	70,380	
		Average Age:				40.20		Average Service:			13.22	

Historical Active and DROP Participant Data

Valuation Date	Number of Participants	Average Age	Projected Annual Payroll (\$000)	Average Annual Salary	Percentage Increase in Average Salary
January 1, 1976	2,262	33.0	34,600	15,318	31.2%
January 1, 1978	2,158	33.5	40,200	18,639	21.7
January 1, 1980	2,543	32.5	49,900	19,646	5.4
January 1, 1982	2,942	32.5	73,844	25,100	27.8
July 1, 1984	3,204	34.0	86,068	26,863	7.0
July 1, 1986	3,167	33.7	99,619	31,455	17.1
July 1, 1987	3,164	35.3	99,837	31,554	0.3
July 1, 1988	3,023	36.1	96,051	31,774	0.7
July 1, 1989	2,967	36.7	98,091	33,061	4.1
July 1, 1990	2,926	37.1	97,633	33,367	0.9
July 1, 1991	2,969	37.6	104,350	35,147	5.3
July 1, 1992	2,913	38.3	102,360	35,139	0.0
July 1, 1993	2,958	38.6	119,503	40,400	15.0
July 1, 1994	2,945	39.2	120,082	40,775	0.9
July 1, 1995	3,084	39.2	126,977	41,173	1.0
July 1, 1996	3,039	40.1	131,641	43,317	5.2
July 1, 1997	3,202	40.2	141,949	44,331	2.3
July 1, 1998	3,229	40.9	149,045	46,158	4.1
July 1, 1999	3,282	41.4	158,965	48,435	4.9
July 1, 2000	3,271	42.1	163,630	50,024	3.3
July 1, 2001	3,318	42.1	164,315	49,522	(1.0)
July 1, 2002	3,375	41.8	190,578	56,468	14.0
July 1, 2004	3,656	40.4	181,526	48,206	(14.6)
July 1, 2005	3,894	39.4	192,084	49,358	2.4
July 1, 2006	3,796	41.2	218,746	52,731	6.8
July 1, 2007	3,819	40.5	232,397	57,581	9.2
July 1, 2008	3,876	40.2	239,172	59,909	4.0
July 1, 2009	3,949	40.3	258,949	61,053	1.9
July 1, 2010	3,911	40.5	265,836	63,296	3.7
July 1, 2011	3,861	40.5	272,462	65,712	3.8
July 1, 2012	3,788	40.8	270,873	66,631	1.0
July 1, 2013	3,745	40.4	271,828	67,746	1.2
July 1, 2014	3,826	40.6	278,166	70,586	4.2
July 1, 2015	3,938	40.1	292,489	69,343	(1.8)
July 1, 2016	4,094	40.2	296,778	70,380	1.5

Summary of Inactive Participants as of July 1, 2016

	Number	Annual Benefits (\$000)	Average Annual Benefits
Benefits in Pay Status			
Retirees	2,232	\$ 111,348	\$ 49,887
Beneficiaries	591	23,281	39,392
Disabled Participants	<u>315</u>	<u>15,376</u>	<u>48,814</u>
Total	3,138	\$ 150,005	\$ 47,803
Deferred Benefits			
Vested Terminated Participants	43	\$ 100 ¹	\$ 2,334
Beneficiaries	N/A	N/A	N/A
Disabled Participants	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Total	43	\$ 100	\$ 2,334

¹ Does not include \$561,000 in pending refunds.

Retirees and Beneficiaries Added to and Removed from Rolls

Period Ended	Added to Rolls		Removed from Rolls		Rolls at the End of the Year		Percentage Increase in Annual Benefits	Average Annual Benefit
	Number	Annual Benefits (\$000)	Number	Annual Benefits (\$000)	Number	Annual Benefits (\$000)		
December 31, 1978	72	719	23	76	794	4,294	15.8%	5,408
December 31, 1979	67	719	21	83	840	5,008	16.6	5,962
December 31, 1980	33	473	23	84	850	5,498	9.8	6,468
December 31, 1981	61	862	38	159	873	6,097	10.9	6,983
December 31, 1982	63	644	26	171	910	6,772	11.1	7,442
December 31, 1983	54	605	39	207	925	7,403	9.3	8,003
June 30, 1984 ¹	41	619	17	98	949	3,952	6.8	8,328
June 30, 1985	75	968	53	290	971	8,432	6.7	8,684
June 30, 1986	54	752	38	243	987	9,550	13.3	9,676
June 30, 1987	76	1,101	33	235	1,030	10,522	10.2	10,215
June 30, 1988	121	2,002	38	311	1,113	12,754	21.2	11,459
June 30, 1989	74	1,306	42	299	1,145	14,032	10.0	12,255
June 30, 1990	111	1,996	37	288	1,219	16,428	17.1	13,477
June 30, 1991	129	1,784	38	401	1,310	17,888	8.9	13,665
June 30, 1992	78	1,588	44	401	1,344	19,866	11.1	14,781
June 30, 1993	82	1,717	48	585	1,378	21,516	8.3	15,614
June 30, 1994	112	2,006	58	660	1,432	23,297	8.3	16,269
June 30, 1995	87	1,728	28	353	1,491	25,142	7.9	16,863
June 30, 1996	67	1,402	56	660	1,502	26,379	4.9	17,563
June 30, 1997	56	1,050	37	487	1,521	27,581	4.6	18,133
June 30, 1998	54	1,064	43	477	1,532	28,675	4.0	18,717
June 30, 1999	64	1,840	28	551	1,568	30,233	5.4	19,281
June 30, 2000	95	2,364	71	1,167	1,592	34,583	14.4	21,723
June 30, 2001	127	3,581	47	775	1,672	38,347	10.9	22,935
June 30, 2002	172	5,493	61	998	1,783	44,300	15.5	24,846

¹ Six-month period

Retirees and Beneficiaries Added to and Removed from Rolls (continued)

Period Ended	Added to Rolls		Removed from Rolls		Rolls at the End of the Year		Percentage Increase in Annual Benefits	Average Annual Benefit
	Number	Annual Benefits (\$000)	Number	Annual Benefits (\$000)	Number	Annual Benefits (\$000)		
June 30, 2004 ¹	377	N/A	109	N/A	2,051	57,676	30.2	28,121
June 30, 2005	135	4,353	53	1,107	2,133	62,882	9.0	29,481
June 30, 2006	195	7,231	60	1,437	2,268	70,420	12.0	31,050
June 30, 2007	106	3,822	59	1,407	2,315	74,948	6.4	32,375
June 30, 2008	166	9,334	21	828	2,460	98,216	31.0	39,925
June 30, 2009	133	3,369	43	2,081	2,550	94,536	-3.7	37,073
June 30, 2010	162	7,159	103	2,886	2,609	96,580	2.2	37,018
June 30, 2011	181	8,905	64	1,489	2,726	106,832	10.6	39,190
June 30, 2012	141	7,042	77	2,398	2,790	114,176	6.8	40,923
June 30, 2013	170	8,286	54	1,837	2,906	124,080	8.7	42,698
June 30, 2014	162	7,772	70	1,401	2,998	132,749	7.0	44,279
June 30, 2015	147	7,273	85	383	3,060	140,629	5.9	45,957
June 30, 2016	138	7,496	60	2,302	3,138	150,005	6.7	47,803

¹ Two-year period

Section VI: Miscellaneous Information

Summary of Actuarial Methods and Assumptions

Basis for Assumptions

The economic and demographic assumptions used in the valuation were adopted by the Board in consultation with Conduent Human Resource Services (Conduent). The Board's established practice is to review the experience of the Retirement System at least once every five years to determine if any changes to the valuation assumptions are warranted. In general, the assumptions used in the valuation are based on recommendations made and approved by the Board as part of an Experience Study covering plan years from July 1, 2009 through June 30, 2013. On October 18, 2016, the Board voted to interpret the amortization period to be a closed 30 year period as of July 1, 2015. In addition on May 30, 2017, the Board reviewed the investment rate of return assumption and adopted a rate of 7.25% based upon a review of the portfolio and current analysis available that future investment expectations have declined over the last 10-15 years and an additional 0.25% margin for possible adverse deviations. Valuation results at the prior assumed investment return rate of 8.50% have also been provided at July 1, 2016 in order to quantify the impact of the assumption change.

Actuarial Methods

Actuarial Value of Assets

Gains and losses on the market value of assets, based on the difference between the actual rate of return and the assumed rate of return, are recognized in the actuarial value over five years. Past gains and losses were fully recognized in the Actuarial Value of Assets at July 1, 2013. New gains and losses will be recognized over five years beginning July 1, 2014.

Actuarial Cost Method

Entry Age Method with liabilities allocated from date of entry to expected payment of benefit. The Unfunded Actuarial Accrued Liability (Surplus), including the effects of actuarial gains and losses, is amortized as a level percentage of payroll over a closed amortization period 30 years effective July 1, 2015. The contribution is increased for interest for one-half of a year to reflect the anticipated timing of payment.

Summary of Actuarial Methods and Assumptions (continued)

Key Economic Assumptions

Investment Return

Real Rate of Return	4.25%
Price Inflation	<u>3.0%</u>
Total Nominal Rate	7.25%

Investment Returns prior to July 1, 2016 are assumed to be 8.5%. Expected future investment returns are assumed to be net of administrative and investment expenses.

Wage and Price Inflation

3.0%

Payroll Growth Rate

3.0%

Individual Pay Increase Rate

	(Nominal = Merit + Wage Inflation)	
Age	Nominal	Merit
20	7.00%	4.00%
25	6.25%	3.25%
30	5.50%	2.50%
35	5.00%	2.00%
40	4.00%	1.00%
45	3.70%	0.70%
50	3.40%	0.40%
55	3.00%	0.00%

Summary of Actuarial Methods and Assumptions (continued)

Key Demographic Assumptions

Retirement Rates

Number of Years of Service	Probability of Retiring Within One Year
20	1%
21	1%
22	1%
23	1%
24	1%
25	5%
26	5%
27	5%
28	5%
29	5%
30	15%
31	15%
32	15%
33	15%
34	15%
35	25%
36	25%
37	30%
38	35%
39	40%
40+	100%

Summary of Actuarial Methods and Assumptions (continued)

DROP Duration

Duration of DROP at Retirement	Percentage of Participants Electing Retirement at the Specified Duration
0	0%
3	0
5	5
8	30
10	65

Sample Rates

Number of Years of Service at Actual Retirement	Percentage of Participants Retiring with Specific Drop Durations				
	0 yr.	3 yrs.	5 yrs.	8 yrs.	10 yrs.
20	0%	0%	0%	0%	0%
25	0	0	100	0	0
30	0	0	5	30	65
35	0	0	5	30	65
40	0	0	0	0	100

Mortality Rates

Active participants and nondisabled pensioners

RP-2000 Table projected to year 2026 using Scale AA.

Note: The RP-2000 Mortality Table projected to year 2026 using scale AA is used to determine the mortality assumptions for the plan, including the probability of ceasing active service due to death.

Disabled pensioners

Graduated rates (see table below for sample rates).

Disability Rates

Graduated rates (see table below for sample rates).

Percentage of Deaths and Disabilities in the Line of Duty

Age	Death	Disability ¹
25	100%	60%
35	100	60
45	42	34
55	20	25

¹ 1% of firefighters who become disabled in the line of duty are assumed to be incapable of performing any substantial gainful activity.

Summary of Actuarial Methods and Assumptions (continued)

Termination Rates

Age	Termination Rate
20	1.30%
25	1.30
30	1.18
35	0.70
40	0.40
45	0.45
50	0.00

For participants terminating with at least 10 years but less than 20 years of service:

- 50% will elect a contribution refund
- 50% will elect a deferred monthly pension benefit

Marital Status at Benefit Eligibility

Percentage married

90% of participants are assumed to be married.

No beneficiaries other than the spouse assumed.

Age difference

Husbands assumed to be three years older than wives.

Adjustment to Reflect Definition of Average Monthly Salary

Active liabilities and normal costs were increased 5% to account for differences between the plan's definition of average monthly salary (average of the highest 78 pay periods), and the average of the final 78 pay periods.

Development of Valuation Pay

Valuation pay is developed by increasing the prior year's pay with the nominal individual pay increase rate.

Age at which Benefits End for Child Beneficiaries

Benefits are assumed to end once the child beneficiary reaches age 23.

Missing Data Assumptions

Pay for New Hires

None were missing.

Employee Contributions

Based on the prior year's contributions and current year's pay.

Age at First Payment for Vested Terminations:

50

Benefits Not Valued

The proportional retirement program between the Houston municipal, police and fire pension funds which allows for combining service credit from two or more City of Houston pension plans was not valued because its impact is expected not to be material.

Summary of Actuarial Methods and Assumptions (continued)

Sample Rates

Age	Sample Rates per 100 Participants				
	Non-disabled Mortality		Disabled Mortality		Disability
	Male	Female	Male	Female	All
20	0.03	0.02	2.30	0.70	0.75
25	0.04	0.02	2.60	1.30	0.75
30	0.04	0.03	2.90	1.90	0.75
35	0.07	0.05	2.80	2.20	1.50
40	0.10	0.07	3.10	2.30	1.50
45	0.15	0.11	3.50	2.30	1.50
50	0.21	0.17	4.01	2.60	1.50
55	0.36	0.27	5.30	3.00	1.50
60	0.67	0.50	6.50	3.40	3.00

Changes in Assumptions and Methods since the Prior Year

The following changes in assumptions and methods have taken place since the July 1, 2015 valuation:

- In general, the mortality rates applicable to active and non-disabled participants are based on the RP-2000 table projected 10 years from the valuation date. Therefore, the mortality rates have been updated from the RP-2000 table projected to 2025 using scale AA to the RP-2000 table projected to 2026 using Scale AA. This increased the actuarial accrued liability by approximately \$4 million.
- The assumed investment rate of return was changed from 8.5% to 7.25%. This change increased the actuarial accrued liability by approximately \$504,000,000.

Summary of Plan Provisions

Membership

Any firefighter who has not reached the age of 36 at the time he or she first enters employment shall automatically become a participant in the Fund upon completing the training period. Before October 1, 1990, the eligibility age was age 31. Before 1984, participants entered the Fund on January 1 or July 1.

Average Salary

The average of the highest 36 months of salary (or 78 pay periods), including base pay and overtime, before reduction for pre-tax employee contributions and salary deferrals.

Standard Service Pension

Eligibility

20 years of service

Benefit

For retirement on or after November 1, 1997, 50% of average monthly salary; plus 3% of average monthly salary per year of service in excess of 20 years.

For retirement on or after November 1, 1996 and prior to November 1, 1997, 48.334% of average monthly salary, plus 2.834% of average monthly salary per year of service in excess of 20 years.

For retirement on or after November 1, 1995 and prior to November 1, 1996, 46.667% of average monthly salary, plus 2.667% of average monthly salary per year of service in excess of 20 years.

For retirement on or after September 1, 1991 and prior to November 1, 1995, 45% of average monthly salary, plus 2.5% of average monthly salary per year of service in excess of 20 years, up to 30 years, plus 1.0% of average monthly salary in excess of 30 years.

For retirement on or after September 1, 1989 and prior to September 1, 1991, 45% of average monthly salary, plus 2.5% of average monthly salary per year of service in excess of 20 years.

For retirement on or after September 1, 1987 and prior to September 1, 1989, 45% of average monthly salary, plus 2% of average monthly salary per year of service in excess of 20 years.

For retirement on or after July 1, 1986 and prior to September 1, 1987, 40% of average monthly salary plus 2% of average monthly salary per year of service in excess of 20 years.

For retirement on or after January 1, 1970 and prior to July 1, 1986, 35% of average monthly salary plus 3% of average monthly salary per year of service in excess of salary per year of service in excess of 25 years.

Maximum

For retirement on or after September 1, 1991, 80% of average monthly salary.

For retirement on or after September 1, 1989 and prior to September 1, 1991, 70% of average monthly salary.

For retirement on or after September 1, 1987 and prior to September 1, 1989, 65% of average monthly salary.

For retirements on or after January 1, 1970 and prior to September 1, 1987, 60% of average monthly salary.

In addition, a member will receive a \$5,000 lump sum payment upon retirement.

Summary of Plan Provisions (continued)

Alternate Service Pension

Eligibility

Firefighters who became participants prior to September 1, 1987 and who attain age 50 with 20 years of service will receive the greater of the standard or alternate pension.

Benefit

50% of average monthly salary plus 1% of average monthly salary per year of service after becoming eligible to retire on an alternate pension.

Maximum

65% of average monthly salary.

Supplemental Bonus Check

Supplemental payments totaling up to \$5 million will be payable on a prorated basis determined by the Board of Trustees to all retirees and survivors.

Deferred Retirement Option Plan (DROP)

Eligibility

20 years of service.

Benefit

Effective July 1, 2000, eligible participants may elect to participate in the DROP for up to ten years or until they leave active service. The member's standard or alternate service pension (whichever is greater) will be calculated based on service and earnings at the time the DROP is elected.

A notional account will be maintained for each DROP participant. This account will be credited with the following amounts while the member is a participant of the DROP:

- The member's monthly retirement pension, including applicable cost-of-living adjustments,
- The member's contribution to the Retirement Fund, and
- Investment earnings/losses at the rate of the Retirement Fund's earnings/losses averaged over a five-year period.

A benefit equal to the DROP account balance would be paid at the time the member leaves active service. The payment would be made as a single lump sum or as the member chooses.

Effective on July 1, 2000, a three-year back DROP is available for all eligible participants. The DROP account would be recalculated based on what the account balance would have been had the participant elected the DROP up to 3 years earlier than he/she actually did. The initial DROP entry date cannot be backdated prior to September 1, 1995, or prior to 20 years of credited service, and must be on the first of the month selected.

The monthly benefit for a participant at actual retirement will increase 2% for every year of DROP participation (Phased in at 1% effective September 1, 2000 and 1% effective September 1, 2001).

Members can remain in the DROP for 13 years. However, the member's contributions to the Fund will only be credited to his DROP account for the first ten years. Additionally, a maximum of 20% will be added to his benefit at actual retirement.

If a DROP participant suffers an on-duty disability resulting in the inability to perform any gainful activity or dies in the line of duty, the death or disability annuity benefit would be calculated as though the participant had not entered the DROP. In addition, the DROP account would be payable to the participant or beneficiary.

Summary of Plan Provisions (continued)

Service-Connected Disability Pension

Eligibility

No age or service requirements.

Benefit

50% of average monthly salary or service pension if greater and eligible. Firefighters who are not capable of performing any substantial gainful activity will receive 75% of average monthly salary, or service pension, if greater and eligible.

In addition, a member will receive a \$5,000 lump sum.

Non-Service-Connected Disability Pension

Eligibility

No age or service requirements.

Benefit

25% of average monthly salary, plus 2.5% of average monthly salary per year of service.

Maximum

50% of average monthly salary or service pension, if greater and eligible.

In addition, a member will receive a \$5,000 lump sum.

Vested Pension

Eligibility

At least 10 but less than 20 years of service.

Benefit

1.7% of average monthly salary per year of service, payable beginning at age 50 or optional refund of contributions with interest at a flat rate of 5% not compounded.

Summary of Plan Provisions (continued)

Death Benefits

Payable as specified below if survived by a spouse, dependent children, or dependent parents. Effective November 1, 1997 dependent children can continue to receive benefits between the ages of 18 and 22 if they are in college.

Non-service-connected

Monthly benefit that would have been payable had the participant retired for non-service-connected disability on the date of his or her death (or service pension if greater).

Postretirement

Monthly benefit payable to the participant prior to his or her death. Effective July 1, 1998, a “graded” postretirement death benefit is payable to a surviving spouse if the retiree was not married at the time of retirement. This “graded” benefit is equal to 20% of the postretirement death benefit for each year of marriage to a maximum 100% after five years of marriage.

Preretirement

In the case of the death of an active firefighter in the line of duty, eligible survivor will receive a benefit equal to 100% of the decedent’s average monthly salary. Refund of contributions made if no eligible survivors. If death occurs after 10 years of service, interest is credited on the contributions at the flat rate of 5% not compounded. If death occurs before 10 years of service, no interest is credited.

Lump sum

A one-time \$5,000 lump sum death benefit for any active or retired firefighter. This benefit applies to active members, current retirees, and disabled participants.

Summary of Plan Provisions (continued)

Additional Benefit

Effective on or after July 1, 2001, an extra monthly benefit of \$150 is payable for life to any retired or disabled member or to an eligible survivor of a deceased member. This benefit is not subject to the postretirement adjustment.

Excess Benefit

Benefit equal to the excess of any members' standard service pension benefit over the limit imposed by Section 415 of the code.

Postretirement Adjustment

Prior to October 1, 1990

Pensions adjusted each year based on changes in the CPI-U, but not below original amount or above original amount increased 3% each year, not compounded.

Pension adjustments for participants who retire after March 1, 1982 begin at age 55.

Pension adjustments begin immediately for participants whose benefits become payable on or after July 1, 1986 and are based upon 30 or more years of service.

On or after October 1, 1990 and prior to November 1, 1997

Pensions adjusted each year based on changes in the CPI-U. The adjustment is based on the amount of benefits payable at the time of adjustment. The maximum annual increase shall be 3% of the benefits payable at the time of adjustment.

Pension adjustments begin immediately for participants whose benefits become payable on or after July 1, 1986 and are based upon 30 or more years of service.

On or after November 1, 1997

Pensions adjusted each year at a fixed rate of 3%. The adjustment is based on the amount of benefits payable at the time of adjustment.

Pension adjustments for participants who retire or terminate with a vested benefit after March 1, 1982 begin at age 48. Pension adjustments begin immediately for participants who become disabled and cannot perform any substantial gainful activity (current and future) and qualify for general on-duty disability benefits. Participants whose benefits become payable on or after July 1, 1986 and are based upon 30 or more years of service are also eligible for pension adjustments to begin immediately.

Contribution Rates

Members

9% of salary. Participants receive a refund of contributions without interest in the event of termination before 10 years of service.

City

Beginning in 1983, the rate required to fund the Retirement Fund on an actuarial reserve basis. However, a minimum contribution of twice the employee contribution rate is required by statute.

Changes in Plan Provisions since the Prior Year

Plan provisions reflected in the July 1, 2016 valuation are the same as those in the prior valuation.

Actuarial Certification

We certify that the information contained in this Actuarial Report has been prepared in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information fairly presents the actuarial position of the Houston Firefighters' Relief & Retirement Fund as of July 1, 2016.

The Board of Trustees of the Fund can use this report for determining the Actuarial City Contribution Rate. Use of this report for any other purpose or by anyone other than the Board may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Conduent recommends requesting it to perform an advance review of any statement, document, or filing based on information contained in this report. Conduent will accept no liability for any such statement, document or filing made without prior review by Conduent.

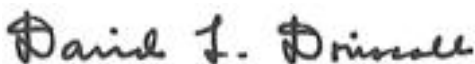
Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of this valuation. Where presented, references to "funded ratio" and "unfunded accrued liability" typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

In preparing the actuarial results, we have relied upon information provided by the Board of Trustees regarding plan provisions, plan participants, plan assets, contribution rates and other matters used in the actuarial valuation. Although we did not audit the data, we reviewed the data for reasonableness and consistency with the prior year's information. The results of the valuation are dependent on the accuracy of the data. The prior actuaries prepared historical information for 2004 and prior fiscal years. We did not verify or provide an actuarial review of this historical information.


The Board of Trustees selected the actuarial methods and assumptions used in this valuation (other than the investment return assumption, as noted earlier) on the basis of an experience study covering the five-year period ending June 30, 2013. The Board has sole authority to determine the expected investment return and other actuarial assumptions. In our opinion, the actuarial assumptions used are appropriate for purposes of the valuation and are reasonably related to the experience of the Fund and to reasonable long-term expectations. The mortality improvement assumption was updated in accordance with Actuarial Standard of Practice No. 35. The plan provisions are the same as those used in the previous valuation.

We are Members of the American Academy of Actuaries and meet the Qualification Standards of the Academy to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Conduent Human Resource Services



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DLD