

*Houston Firefighters' Relief and Retirement Fund*

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**Actuarial Report as of July 1, 2002**

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*December 2002*

## Summary of Key Results (\$000)

	July 1, 2002	July 1, 2001
<b>City Contribution Rate<sup>(1)</sup></b>		
■ Normal Cost (City Portion)	22.1%	22.3%
■ Amortization of Unfunded Actuarial Accrued Liability (Surplus)	1.7	(7.4)
■ Additional Statutory Requirement	<u>0.0</u>	<u>0.5</u>
■ City Contribution Rate	23.8	15.4
<b>Summary of Assets</b>		
■ Market Value	\$ 1,655,165	\$ 1,721,488 <sup>(2)</sup>
■ Actuarial Value	1,922,405	1,863,098
<b>Summary of Liabilities</b>		
■ Actuarial Accrued Liability	\$ 1,970,154	\$ 1,650,810
■ Actuarial Value of Assets	<u>(1,922,405)</u>	<u>(1,863,098)</u>
■ Unfunded Actuarial Accrued Liability (Surplus)	47,749	(212,288)
<b>Summary of Data</b>		
■ Number of Participants Included in the Valuation		
— Active participants	2,116	2,030
— DROP participants	1,259	1,288
— Retirees and beneficiaries	1,783	1,672
— Vested terminated participants	<u>12</u>	<u>15</u>
— Total	5,170	5,005
■ Annual Payroll		
— Active participants	\$ 112,477	\$ 93,808
— DROP participants	<u>78,101</u>	<u>70,507</u>
— Total	190,578	164,315

<sup>(1)</sup> Average for the year

<sup>(2)</sup> Revised from prior report; based on current year's financial statement

# Table of Contents

Page

## Section I: Asset Information

Summary of Market Value of Assets .....	1
Change in Market Value of Assets Since the Prior Year .....	2
Development of Actuarial Value of Assets.....	3

## Section II: Basic Valuation Results

Unfunded Actuarial Accrued Liability (Surplus) .....	4
Change in Unfunded Actuarial Accrued Liability (Surplus) Since the Prior Year .....	5
Historical Unfunded Actuarial Accrued Liability (Surplus).....	6
Historical Solvency Test.....	7
Analysis of Financial Experience .....	8

## Section III: Contribution Rate

City Contribution Rate .....	9
Change in City Contribution Rate Since the Prior Year .....	10
Historical City Contribution Rate as a Percentage of Covered Payroll.....	11

## Section IV: Valuation Forecast

Projection of Estimated Assets and Liabilities .....	12
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## Section V: Participant Information

Participant Data Reconciliation .....	13
Summary of Active Participants .....	14
Summary of DROP Participants.....	15
Summary of All Participants .....	16
Historical Active and DROP Participant Data .....	17
Summary of Inactive Participants.....	18
Retirees and Beneficiaries Added to and Removed from Rolls.....	19

# Table of Contents

## Section VI: Miscellaneous Information

Summary of Actuarial Methods and Assumptions .....	20
Changes in Methods and Assumptions Since the Prior Year.....	24
Summary of Plan Provisions.....	25
Changes in Plan Provisions Since the Prior Year .....	31
Actuarial Certification .....	32

## Summary of Market Value of Assets as of July 1, 2002 (\$000)

Investment Category	<u>July 1, 2002</u>		<u>July 1, 2001</u>	
	Amount	Percent	Amount	Percent
■ Cash and Short-Term Investments	\$ 51,659	3.1%	\$ 59,753	3.5%
■ Fixed Income Investments	478,732	28.9	533,230	31.0
■ Equity Securities	703,238	42.6	734,639	42.7
■ Other Investments*	416,677	25.1	386,849	22.4
■ Other Assets (Liabilities)				
— Miscellaneous receivables	26,935	1.6	24,123	1.4
— Miscellaneous payables	(17,076)	(1.0)	(12,106)	(0.7)
— Self-insurance reserve fund	<u>(5,000)</u>	<u>(0.3)</u>	<u>(5,000)</u>	<u>(0.3)</u>
— Net	4,859	0.3	7,017	0.4
■ Total	1,655,165	100.0	1,721,488	100.0

\* Includes land, building and other assets

**Change in Market Value of Assets Since the Prior Year (\$000)**

■ Market Value as of July 1, 2001	\$ 1,721,488
■ Contributions and Disbursements	
— City contributions	28,451
— Employee contributions	14,219
— Benefit payments	(57,820)
— Contributions refunds	(179)
— Contributions to self-insured reserve fund	<u>0</u>
— Net	(15,329)
■ Net Investment Return	(50,994)
■ Market Value of Assets as of July 1, 2002	1,655,165
■ Approximate Annual Rate of Return (after Expenses)	(3.0)%

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

### Actuarial Investment Gain (Loss) for the Year

■ Market Value of Assets as of July 1, 2001	\$ 1,721,488
■ City Contributions	28,451
■ Employee Contributions	14,219
■ Benefit Payments and Contribution Refunds	(57,999)
■ Contributions to Self-Insurance Reserve Fund	0
■ Expected Interest at 8.5%	<u>145,688</u>
■ Expected Market Value of Assets as of June 30, 2002	1,851,847
■ Actual Market Value of Assets as of June 30, 2002	<u>1,655,165</u>
■ Actuarial Investment Gain (Loss)	(196,682)

### Schedule of Actuarial Investment Gains (Losses)

Plan Year Ending	Initial Actuarial Gain (Loss)	Five-Year Amortization	Unrecognized Gain (Loss) as of July 1, 2002*
June 30, 2002	\$ (196,682)	\$ (39,336)	\$ (157,345)
June 30, 2001	(177,576)	(35,515)	(106,546)
June 30, 2000	19,600	3,920	7,840
June 30, 1999	(55,943)	(11,189)	(11,189)
June 30, 1998	55,422	11,084	<u>0</u>
			(267,240)

\* Deferred for recognition in future years.

### Actuarial Value of Assets

■ Market Value as of July 1, 2002	\$ 1,655,165
■ (Gain) Loss to be Recognized in Future Years	<u>267,240</u>
■ Actuarial Value as of July 1, 2002	1,922,405

## Unfunded Actuarial Accrued Liability (Surplus) (\$000)

	July 1, 2002	July 1, 2001
■ Actuarial Present Value of Future Benefits		
— Active participants	\$ 744,645	\$ 624,795
— DROP participants	957,185	832,981
— Vested terminated participants	1,134	1,444
— Retirees and beneficiaries	<u>697,830</u>	<u>553,888</u>
— Total	2,400,794	2,013,108
■ Actuarial Present Value of Future Employee Contributions	(119,135)	(100,268)
■ Actuarial Present Value of Future Normal Costs (City Portion)	<u>(311,505)</u>	<u>(262,030)</u>
■ Actuarial Accrued Liability	1,970,154	1,650,810
■ Actuarial Value of Assets	<u>(1,922,405)</u>	<u>(1,863,098)</u>
■ Unfunded Actuarial Accrued Liability (Surplus)	47,749	(212,288)



## Change in Unfunded Actuarial Accrued Liability (Surplus) Since the Prior Year (\$000)

■ Unfunded Actuarial Accrued Liability (Surplus) as of July 1, 2001	\$ (212,288)
■ Change due to Normal Operation	
— Normal cost (City portion)	36,642
— City contributions	(28,451)
— Interest	17,452
— Recognition of prior asset losses (gains)	<u>31,700</u>
— Net change	57,343
■ Change due to Actuarial Experience	
— Actuarial (gain) loss from asset sources	39,336
— Actuarial (gain) loss from liability sources	<u>163,358</u>
— Net change	202,694
■ Unfunded Actuarial Accrued Liability (Surplus) as of July 1, 2002	47,749

## Historical Unfunded Actuarial Accrued Liability (Surplus) (\$000)

Valuation Date	Actuarial Accrued Liability (AAL)	Actuarial Value of Assets (AVA)	AVA as a Percentage of AAL	Unfunded AAL (Surplus)	Covered Payroll	UAAL (Surplus) as a Percentage of Covered Payroll
July 1, 1982	\$ 208,877	\$ 148,191	71%	\$ 60,686	\$ 73,844	82%
July 1, 1984	294,584	228,032	77	66,552	86,068	77
July 1, 1986	396,609	401,271	101	(4,662)	99,619	(5)
July 1, 1987	415,871	453,322	109	(37,451)	99,837	(38)
July 1, 1988	440,012	478,460	109	(38,448)	96,051	(40)
July 1, 1989	473,431	543,898	115	(70,467)	98,091	(72)
July 1, 1990	512,471	598,814	117	(86,343)	97,633	(88)
July 1, 1991	621,014	642,499	103	(21,485)	104,350	(21)
July 1, 1992	670,123	694,080	104	(23,957)	102,360	(23)
July 1, 1993	758,642	762,794	101	(4,152)	119,503	(3)
July 1, 1994	793,011	831,741	105	(38,730)	120,082	(32)
July 1, 1995	852,327	912,417	107	(60,090)	126,977	(47)
July 1, 1996	989,343*	1,024,569	104	(35,226)	131,641	(27)
July 1, 1997	1,128,230	1,183,817	105	(55,587)	141,989	(39)
July 1, 1998	1,271,416	1,347,414	106	(75,998)	149,045	(51)
July 1, 1999	1,470,597	1,538,487	105	(67,890)	158,965	(43)
July 1, 2000	1,589,350	1,726,302	109	(136,952)	163,630	(84)
July 1, 2001	1,650,810	1,863,098	113	(212,288)	164,315	(129)
July 1, 2002	1,970,154	1,922,405	98	47,749	190,578	25

\* Includes the effect of the change in plan provisions effective November 1, 1996.

## Historical Solvency Test (\$000)

Valuation Date	Actuarial Accrued Liability for:				Portion of Actuarial Accrued Liability Covered by Assets		
	Employee Contributions (1)	Retirees, Beneficiaries, and Vested Participants (2)	Active Participants (City-Financed Portion) (3)	Actuarial Value of Assets	(1)	(2)	(3)
July 1, 1984	\$ 49,367	\$ 106,204	\$ 93,480	\$ 228,032	100%	100%	78%
July 1, 1986	62,253	133,219	201,137	401,271	100	100	100
July 1, 1987	68,057	140,330	207,484	453,322	100	100	100
July 1, 1988	71,001	162,085	206,926	478,460	100	100	100
July 1, 1989	74,324	176,865	222,242	543,898	100	100	100
July 1, 1990	77,472	203,190	231,809	598,814	100	100	100
July 1, 1991	82,301	245,391	293,322	642,499	100	100	100
July 1, 1992	87,254	270,511	312,358	694,080	100	100	100
July 1, 1993	92,709	292,558	373,375	762,794	100	100	100
July 1, 1994	97,583	318,222	377,206	831,741	100	100	100
July 1, 1995	103,552	342,388	406,387	912,417	100	100	100
July 1, 1996	131,421	360,055	497,867	1,024,569	100	100	100
July 1, 1997	156,501	383,605	588,124	1,183,817	100	100	100
July 1, 1998	261,186	389,700	614,957	1,347,414	100	100	100
July 1, 1999	324,154	424,990	721,453	1,538,487	100	100	100
July 1, 2000	376,688	438,303	774,359	1,726,302	100	100	100
July 1, 2001	374,918	555,332	720,560	1,863,098	100	100	100
July 1, 2002	406,522	698,964	864,668	1,922,405	100	100	94

## Analysis of Financial Experience (\$000)

Year Ended	Gain (Loss) During the Year From Financial Experience			Non-Recurring Items*	Composite Gain (Loss) During the Year
	Liability Sources	Asset Sources	Total		
June 30, 1997	\$ (6,027)	\$ 30,894	\$ 24,867	\$ 0	\$ 24,867
June 30, 1998	(9,126)	7,467	(1,659)	(11,082)	(12,741)
June 30, 1999	(30,772)	(11,189)	(41,961)	(57,642)	(99,603)
June 30, 2000	21,667	3,920	25,587	(15,950)	9,637
June 30, 2001	(9,353)	(35,515)	(44,868)	68,166	23,298
June 30, 2002	(163,358)	(39,336)	(202,694)	0	(202,694)

\* Non-recurring items reflect changes in actuarial assumptions, methods and plan provisions.

# City Contribution Rate

	<u>Fiscal Year 2003</u>	<u>Fiscal Year 2002</u>
	July 1, 2002 through June 30, 2003	Average for July 1, 2001 through June 30, 2002
■ City Normal Cost Rate	22.1%	22.3%
■ Rate to Amortize Unfunded Actuarial Accrued Liability (Surplus) Over 40 Years from January 1, 1983	<u>1.7</u>	<u>(7.4)</u>
■ Preliminary City Contribution Rate	23.8	14.9
■ Additional Statutory Requirement	<u>0</u>	<u>0.5</u>
■ City Contribution Rate (Payable Monthly)	23.8	15.4

## Change in City Contribution Rate Since the Prior Year

■ City contribution Rate as of July 1, 2001 reflecting September 1, 2001 Plan Provisions	15.4%
■ Change in the City Contribution Rate	
— Normal operation of the plan*	2.2
— Actuarial (gain) loss from asset sources	1.4
— Actuarial (gain) loss from liability sources	<u>4.8</u>
■ City Contribution Rate as of July 1, 2002	23.8

\* Includes partial recognition of prior asset losses (gains)

## Historical City Contributions as a Percentage of Covered Payroll

Actuarially Calculated City Contribution Rate <sup>(1)</sup>		Actual City Contribution Rate	
Valuation Date	Rate	Period	Rate
July 1, 1986	14.7%	July 1, 1987 through June 30, 1988	15.0%
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 <sup>(2)</sup>
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 <sup>(3)</sup>	July 1, 1996 through June 30, 1997	15.4
July 1, 1996	14.1 <sup>(3)</sup>	July 1, 1997 through June 30, 1998	15.4
July 1, 1997	14.9 <sup>(3)</sup>	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 <sup>(3)</sup>	July 1, 2001 through June 30, 2002	15.4
July 1, 2001	14.9 <sup>(3)</sup>	July 1, 2002 through June 30, 2003	N/A
July 1, 2002	23.8	July 1, 2003 through June 30, 2004	N/A

(1) Before application of statutory minimum contribution

(2) Excluding additional contribution due to settlement of lawsuit

(3) Average for the year.

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

Year Beginning July 1	Annual Payroll	Estimated Contributions				Estimated Benefit Payments	Net Cash Flow	Market Value Value of Assets at End of Year	Unfunded Actuarial Liability (Surplus) at End of Year
		City		Employee					
		Amount	Percent	Amount	Percent				
2002	\$190,578	\$29,349	15.4%	\$14,674	7.7%	\$143,361	\$(99,338)	\$1,692,381	\$169,943
2003	200,107	47,625	23.8%	15,408	7.7%	141,442	(78,409)	1,754,560	267,512
2004	210,112	59,041	28.1%	16,179	7.7%	145,418	(70,198)	1,830,578	361,677
2005	220,618	69,495	31.5%	16,988	7.7%	164,068	(77,585)	1,905,361	413,498
2006	231,648	80,382	34.7%	17,837	7.7%	151,316	(53,097)	2,012,009	418,242
2007	243,231	88,779	36.5%	18,729	7.7%	155,516	(48,008)	2,133,023	417,309
2008	255,392	93,474	36.6%	19,665	7.7%	153,682	(40,543)	2,272,099	414,207
2009	268,162	98,147	36.6%	20,648	7.7%	167,291	(48,496)	2,414,714	408,912
2010	281,570	103,055	36.6%	21,681	7.7%	169,916	(45,180)	2,572,903	401,142
2011	295,649	108,207	36.6%	22,765	7.7%	151,348	(20,376)	2,770,376	390,585
2012	310,431	113,618	36.6%	23,903	7.7%	174,446	(36,925)	2,967,396	376,899
2013	325,953	119,299	36.6%	25,098	7.7%	182,241	(37,844)	3,180,205	359,704
2014	342,250	125,264	36.6%	26,353	7.7%	191,830	(40,213)	3,408,635	338,587
2015	359,363	131,527	36.6%	27,671	7.7%	197,727	(38,529)	3,658,235	313,089
2016	377,331	138,103	36.6%	29,054	7.7%	202,431	(35,274)	3,932,443	282,711
2017	396,197	145,008	36.6%	30,507	7.7%	206,624	(31,109)	4,234,296	246,901
2018	416,007	152,259	36.6%	32,033	7.7%	210,920	(26,628)	4,566,475	205,055
2019	436,808	159,872	36.6%	33,634	7.7%	216,859	(23,353)	4,930,299	156,511
2020	458,648	168,324	36.7%	35,316	7.7%	225,656	(22,016)	5,326,442	100,064
2021	481,580	176,740	36.7%	37,082	7.7%	236,644	(22,822)	5,755,416	35,332

\* Based on actuarially determined rate from the prior year's valuation



## Participant Data Reconciliation

	Active Participants	DROP Participants	Terminated with Deferred Benefits	Currently Receiving Benefits	Total
■ As of July 1, 2001	2,030	1,288	15	1,672	5,005
■ Changes in Status					
— Service retirements	(4)	(113)	(3)	120	0
— Disability retirements	(5)	(6)	0	11	0
— DROP elections	(95)	95	0	0	0
— Deaths	(1)	(5)	0	(39)	(45)
— Vested terminations	0	0	0	0	0
— Contribution refunds	(8)	0	0	0	(8)
— Expiration of benefits	<u>0</u>	<u>0</u>	<u>0</u>	<u>(10)</u>	<u>(10)</u>
— Net	(113)	(29)	(3)	82	(63)
■ New Entrants	196	0	0	0	196
■ New Beneficiaries	0	0	0	39	39
■ Data Adjustments	<u>3</u>	<u>0</u>	<u>0</u>	<u>(10)</u>	<u>(7)</u>
■ Net Change	86	(29)	(3)	111	165
■ As of July 1, 2002	2,116	1,259	12	1,783	5,170

# Summary of Active Participants as of July 1, 2002\*

Age Last Birthday	-----Completed Years of Service-----							Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	
15-19	Number							
	Tot pay							
	Avg pay							
20-24	68							68
	Tot pay 2375161							2375161
	Avg pay 34929							34929
25-29	244	64						308
	Tot pay 9885519 3454233							13339752
	Avg pay 40514 53972							43311
30-34	205	254	64					523
	Tot pay 8803130 13700253 3559876							26063259
	Avg pay 42942 53938 55623							49834
35-39	70	166	122	71				429
	Tot pay 3010353 8919977 6766187 4101893							22798410
	Avg pay 43005 53735 55461 57773							53143
40-44	1	49	49	226	250	1		576
	Tot pay 42202 2600177 2640405 13473332 15774849 67071							34598036
	Avg pay 42202 53065 53886 59617 63099 67071							60066
45-49		2	5	68	103	19		197
	Tot pay 97651 274492 4126583 6524494 1317262							12340482
	Avg pay 48826 54898 60685 63345 69330							62642
50-54				1	10	3	1	15
	Tot pay 66395 600664 215975 78085							961119
	Avg pay 66395 60066 71992 78085							64075
55-59	Number							
	Tot pay							
	Avg pay							
60-64	Number							
	Tot pay							
	Avg pay							
Over 64	Number							
	Tot pay							
	Avg pay							
Total	588	535	240	366	363	23	1	2116
	Tot pay 24116365 28772291 13240960 21768203 22900007 1600308 78085							112,476,219
	Avg pay 41014 53780 55171 59476 63085 69579 78085							53155
	Average Age = 36 7			Average Service = 10 9				

\* Excludes DROP participants

## Summary of DROP Participants as of July 1, 2002

Age Last Birthdays	-----Completed Years of Service-----							Total	
	0-4	5-9	10-14	15-19	20-24	25-29	30-34		Over 34
15-19	Number								
	Tot pay								
	Avg pay								
20-24	Number								
	Tot pay								
	Avg pay								
25-29	Number								
	Tot pay								
	Avg pay								
30-34	Number								
	Tot pay								
	Avg pay								
35-39	Number								
	Tot pay								
	Avg pay								
40-44	Number								
	Tot pay								
	Avg pay								
45-49	Number								
	Tot pay								
	Avg pay								
50-54	Number								
	Tot pay								
	Avg pay								
55-59	Number								
	Tot pay								
	Avg pay								
60-64	Number								
	Tot pay								
	Avg pay								
Over 64	Number								
	Tot pay								
	Avg pay								
Total	Number								
	Tot pay								
	Avg pay								
		Average Age = 50 4							Average Service = 27 2

## Summary of All Participants as of July 1, 2002

Age Last Birthday	-----Completed Years of Service-----								Total
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	Over 34	
15-19	Number								
	Tot pay								
	Avg pay								
20-24	68								68
	Tot pay								2375161
	Avg pay								34929
25-29	244	64							308
	Tot pay								9885519 3454233
	Avg pay								40514 53972
30-34	205	254	64						523
	Tot pay								8803130 13700253 3559876
	Avg pay								42942 53938 55623
35-39	70	166	122	71					429
	Tot pay								3010353 8919977 6766187 4101893
	Avg pay								43005 53735 55461 57773
40-44	1	49	49	226	388	1			714
	Tot pay								42202 2600177 2640405 13473332 24209775 67071
	Avg pay								42202 53065 53886 59617 62396 67071
45-49		2	5	68	394	230	12		711
	Tot pay								97651 274492 4126583 24165200 14585416 784395
	Avg pay								48826 54898 60685 61333 63415 65366
50-54				1	113	144	162	8	428
	Tot pay								66395 6829775 8847603 10103749 497906
	Avg pay								66395 60440 61442 62369 62238
55-59					1	32	95	23	151
	Tot pay								60932 2015280 6045601 1554796
	Avg pay								60932 62978 63638 67600
60-64							7	22	29
	Tot pay								455180 1561239
	Avg pay								65026 70965
Over 64							1	13	14
	Tot pay								48887 846794
	Avg pay								48887 65138
Total	588	535	240	366	896	407	277	66	3375
	Tot pay								24116365 28772291 13240960 21768203 55265682 25515370 17437812 4460735 190,577,418
	Avg pay								41014 53780 55171 59476 61680 62691 62952 67587 56467

Average Age = 41 8      Average Service = 17 0

## Historical Active and DROP Participant Data

Valuation Date	Number of Participants	Average Age	Annual Payroll (\$000)	Average Annual Salary	Percentage Increase in Average Salary
September 1, 1972	1,930	34.5	\$ 22,500	\$ 11,676	N/A
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

## Summary of Inactive Participants as of July 1, 2002

	Number	Annual Benefits (\$000)	Average Annual Benefit
■ Benefits in Pay Status			
— Retirees	1,099	\$ 30,419	\$ 27,679
— Beneficiaries	437	8,597	19,673
— Disabled participants	<u>247</u>	<u>5,284</u>	21,393
— Total	1,783	44,300	24,846
■ Deferred Benefits			
— Vested terminated participants	12	\$ 78	\$ 6,535
— Beneficiaries	N/A	N/A	N/A
— Disabled participants	<u>N/A</u>	<u>N/A</u>	N/A
— Total	12	78	6,535

## 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, 1977	98	\$ 788	17	\$ 40	745	\$ 3,708	27 0%	\$ 4,978
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*	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

\* Six-month period

*Towers Perrin*

# Summary of Actuarial Methods and Assumptions

## Actuarial Methods

- Actuarial Value of Assets Gains and losses in 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.
  
- Actuarial Cost Method Entry Age Method with liabilities allocated from date of entry to 40 years of service. The Unfunded Actuarial Accrued Liability (Surplus), including the effects of actuarial gains and losses, is amortized as a level percentage of payroll ending December 31, 2022. The contribution is increased for interest for one-half of a year to reflect timing of payment

## Economic Assumptions

- General Inflation 4.0% per year
- Investment Return 8.5% per year, net of expenses
- Payroll Growth Rate 5.0% per year
- Individual Pay Increase Rate

<i>Age</i>	<i>Increase</i>
20	10.0%
25	7.5
30	6.0
35	5.0
40	4.5
45	4.0
50	3.5
55+	3.0



## Summary of Actuarial Methods and Assumptions (cont.)

### Demographic Assumptions

#### ■ Retirement Rates

<i>Number of Years of Service</i>	<i>Probability of Retiring Within One Year</i>
20	2.0%
21	3.0
22	3.0
23	4.0
24	4.0
25	4.0
26	5.0
27	5.0
28	5.0
29	10.0
30	20.0
31	30.0
32	40.0
33	50.0
34	60.0
35	70.0
36	80.0
37	85.0
38	90.0
39	95.0
40+	100.0

#### ■ DROP Duration

<i>Duration at Retirement</i>	<i>Percentage of Participants Electing the Duration</i>
0	10%
3	10
5	10
8	30
10	40

## Summary of Actuarial Methods and Assumptions (cont.)

### ■ Mortality Rates

— Active participants and nondisabled pensioners

1994 Group Annuity Mortality Table (see table below for sample rates).

Note The 1994 Group Annuity Mortality Table 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

<u>Age</u>	<u>Death</u>	<u>Disability*</u>
25	100%	60%
35	100	60
45	42	34
55	20	25

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

### ■ Termination Rates

<u>Age</u>	<u>Termination Rate</u>
20	1.3%
25	1.3
30	1.2
35	0.7
40	0.6
45	0.2
50	0 0

Note: The liability for the optional refund of contributions for participants who terminate with at least 10 but less than 20 years of service was determined by assuming that 50% of such participants elect a refund and 50% elect a deferred monthly benefit.

### ■ Marital Status at Benefit Eligibility

— Percentage married

90% (No beneficiaries other than the spouse assumed).

— Age difference

Husbands assumed to be three years older than wives.

## Summary of Actuarial Methods and Assumptions (cont.)

### Missing Data Assumptions

- Current Age.
  - Active participants 37
  - Retirees and spouse beneficiaries 50
  - Children beneficiaries 10
  - Disabled retirees 40
  - Deferred vested terminations 45
  - DROP participants 50
- Service for Active Participants 17
- Pay \$49,500
- 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.

### Sample Rates

Age	Sample Rates per 100 Participants				
	Nondisabled Mortality		Disabled Mortality		Disability
	Male	Female	Male	Female	All
20	0 05	0 03	2 30	0 70	0 75
25	0 07	0 03	2 60	1 30	0 75
30	0 08	0 04	2 90	1.90	0 75
35	0 09	0 05	2 80	2.20	1 50
40	0 11	0 07	3.10	2 30	1 50
45	0 16	0 10	3 50	2 30	1 50
50	0 26	0 14	4 10	2.60	1 50
55	0 44	0 23	5 30	3.00	1.50
60	0 80	0 44	6.50	3 40	3 00



## **Changes in Methods and Assumptions Since the Prior Year**

The actuarial methods and assumptions used in this valuation are the same as those used in the prior valuation.

## 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

## Summary of Plan Provisions (cont.)

- Standard Service Pension (cont)
  - Maximum
    - 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.
    - 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.
- 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.

## Summary of Plan Provisions (cont.)

### ■ 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 as 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 three annual installments, if 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).

## Summary of Plan Provisions (cont.)

- **Deferred Retirement Option Plan (DROP) (cont.)** 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.
  
- **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.
  
- **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.
  
- **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.
  
- **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)

Service-connected: 100% of average monthly salary.



## Summary of Plan Provisions (cont.)

### ■ Death Benefits (cont.)

Postretirement: Monthly benefit which was 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: 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.

### ■ 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

## Summary of Plan Provisions (cont.)

### ■ Postretirement Adjustment (cont.)

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 adjustment 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

7.7% of salary. 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**

There have been no changes in the plan provisions since the prior valuation.

## Actuarial Certification

This report describes the results of an actuarial valuation of the Houston Firefighters' Relief and Retirement Fund. The Houston Firefighters' Relief and Retirement Fund retained Towers Perrin to perform this actuarial valuation for the purposes of determining the funding status for the plan year July 1, 2002 through June 30, 2003.

The consulting actuaries are members of the Society of Actuaries and other professional actuarial organizations and meet their "General Qualification Standard for Prescribed Statements of Actuarial Opinions" relating to pension plans.

In preparing the actuarial results, we have relied upon information provided by the Board of Trustees regarding plan provisions, plan participants, plan assets, and other matters. While the scope of our engagement did not call for us to perform an audit or independent verification of this information, we have reviewed this information for reasonableness but have not audited it. The accuracy of the results presented in this report is dependent upon the accuracy and completeness of the underlying information. Historical information for years prior to 1984 was prepared by the prior actuaries and was not subjected to our actuarial review.

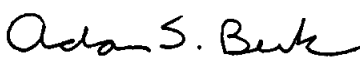
The actuarial methods and assumptions used in this valuation were selected by the Board of Trustees. The Board has sole authority to determine the actuarial assumptions. In our opinion, the actuarial assumptions used are appropriate for purposes of the valuation and, in the aggregate, are reasonably related to the experience of the Fund and to reasonable expectations.

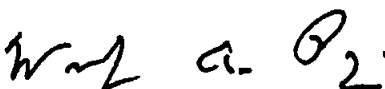
The funding determination portion of this actuarial valuation has been conducted in accordance with principles of practice prescribed by the Actuarial Standards Board and the requirements of the Texas Government Code. Section 802.101 of the Texas Government Code requires the use of actuarial "assumptions and methods that are reasonable in the aggregate, considering the experience of the program and reasonable expectations, and that, in combination, offer the actuary's best estimate of anticipated experience under the program."

The results shown in this report are reasonable actuarial results. However, a different set of results could also be considered reasonable actuarial results, since the Actuarial Standards of Practice describe a "best-estimate range" for each assumption, rather than a single best-estimate value. Thus, reasonable results differing from those presented in this report could have been developed by selecting different points within the best-estimate ranges for various assumptions.

The information contained in this report was prepared for the internal use of the Houston Firefighters' Relief and Retirement Fund and its auditors in connection with our actuarial valuation of the pension plan. It is not intended nor necessarily suitable for other purposes.

Towers Perrin

  
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