

FOR DISCUSSION PURPOSES ONLY

City of Houston Municipal Employees Pension System

Actuarial Report as of July 1, 2001

November 2001

Towers Perrin

Alan S. Taper, FSA
Principal

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November 26, 2001

Board of Trustees
Houston Municipal Employees
Pension System
1111 Bagby, Suite 1450
Houston, Texas 77002

Dear Board Members:

We certify that the information contained in this July 1, 2001 Actuarial Report for the Houston Municipal Employees Pension System has been prepared in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the information is accurate and fairly presents the actuarial position of the System as of July 1, 2001.

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. Historical information for years prior to 1993 was prepared by the prior actuaries and was not subjected to our actuarial review.

Frequency of Actuarial Valuations

Actuarial valuations are prepared at least every three years. The last actuarial valuation was performed as of July 1, 2000.

Financing Objective of the System

Contribution rates are established that, over time, will remain level as a percentage of payroll. The contribution rate has been determined to provide for normal cost plus the level percentage of payroll required to amortize the unfunded actuarial accrued liability (or surplus) over 40 years from January 1, 1983.

Progress Toward Realization of Financing Objective

The summary of accrued and unfunded accrued liabilities in Section II of the report illustrates the progress toward realization of the financing objective.

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Disclosure of Pension Information

Effective for fiscal years beginning July 1, 1996, the Board of Trustees has adopted compliance with the requirements of Governmental Accounting Standards Board (GASB) Statement No. 25. The information required to be disclosed by GASB No. 25 in the notes to the System's financial statements is shown in Sections II and III of the report.

Data

In preparing the July 1, 2001 actuarial valuation, we relied upon data provided by the Board. As part of this valuation, we tested the data for reasonableness. We did not, however, subject this data to any auditing procedures.

Actuarial Methods and Assumptions

The actuarial methods and assumptions described in Section VI of the report were selected by the Board of Trustees based upon our recommendation. The Board has sole authority to determine the actuarial assumptions. Changes in the actuarial methods and assumptions since the prior valuation are also described in Section VI. 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 System and to reasonable expectations.

Plan Provisions

The plan provisions used in the actuarial valuation are described in Section VI of the report. Changes in the plan provisions since the prior valuation are also described in Section VI.

Towers Perrin _____

We are available to answer any questions on the information contained in the report, or to provide any additional information you may need.

Sincerely,



Alan S. Taper, F.S.A., M.A.A.A.
Principal

AST:rr

Enclosure

Summary of Key Results (\$000)

	July 1, 2001	July 1, 2000
City Contribution Rate		
■ Normal Cost (City Portion)	10.0%	7.5%
■ Amortization of Unfunded Actuarial Accrued Liability (Surplus)	<u>7.7</u>	<u>2.0</u>
■ Preliminary City Contribution Rate	17.7%	9.5%
■ Additional Statutory Requirement	<u>0.0</u>	<u>0.5</u>
■ Final City Contribution Rate	17.7%	10.0%
Summary of Assets		
■ Market Value	\$ 1,407,516	\$ 1,483,809
■ Actuarial Value	1,490,179	1,376,020
Summary of Liabilities		
■ Actuarial Accrued Liability	\$ 1,955,806	\$ 1,509,373
■ Actuarial Value of Assets	<u>(1,490,179)</u>	<u>(1,376,020)</u>
■ Unfunded Actuarial Accrued Liability (Surplus)	\$ 465,627	\$ 133,353
Summary of Data		
■ Number of Participants Included in the Valuation		
— Active participants	12,928	13,126
— DROP participants	281	277
— Vested terminated participants	1,226	1,029
— Retirees and beneficiaries	<u>5,457</u>	<u>5,104</u>
— Total	19,892	19,536
■ Annual Base Pay Included in the Valuation		
— Active participants	\$ 413,021	\$ 421,591
— DROP participants	<u>5,213</u>	<u>11,012</u>
— Total	\$ 418,234	\$ 432,603

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Summary of Assets as of July 1, 2001 (\$000)

Investment Category	Market Value	
	Amount	Percent
■ Cash and Cash Equivalents	\$ 6,641	0.5%
■ Fixed Income Investments		
— Government bonds	94,303	6.7
— Corporate bonds	153,189	10.9
— Short-term interest-bearing deposits	<u>68,243</u>	<u>4.8</u>
— Total	\$ 315,735	22.4
■ Equity Investments		
— Capital stock	532,684	37.8
— Commingled funds	<u>295,745</u>	<u>21.0</u>
— Total	\$ 828,429	58.8
■ Other Investments		
— Limited partnerships and real estate investment trust	\$ 280,970	20.0
■ Other Assets (Liabilities)		
— Miscellaneous receivables	67,338	4.8
— Miscellaneous payables	(91,526)	(6.5)
— Written options	<u>(71)</u>	<u>0.0</u>
— Net	\$ (24,259)	(1.7)
■ Total	\$ 1,407,516	100.0%

Change in Assets Since the Prior Valuation (\$000)

■ Market Value as of July 1, 2000	\$ 1,483,809
■ Contributions and Disbursements	
— City contributions	41,298
— Employee contributions	8,532
— Benefit payments	(58,296)
— Contributions refunds	(308)
— Miscellaneous	<u>0</u>
— Net	\$ (8,774)
■ Net Investment Return	
— Interest	20,198
— Dividends	11,045
— Earnings from limited partnerships and real estate investment trust	7,471
— Net (depreciation)/appreciation on investments	(97,938)
— Net proceeds from lending securities	625
— Other income	643
— Investment services expense	(6,548)
— Administrative expenses	<u>(3,015)</u>
— Net	\$ (67,519)
■ Market Value as of June 30, 2001	\$ 1,407,516
■ Approximate Annual Rate of Return (Net of Expenses)*	(4.6)%

* Calculated using a dollar-weighted rate of return assuming all contributions and disbursements are made uniformly throughout the year.

Development of Actuarial Value of Assets (\$000)

Actuarial Investment Gain (Loss) for the Year

■ Market Value of Assets as of July 1, 2000	\$ 1,483,809
■ City Contributions	41,298
■ Employee Contributions	8,532
■ Benefit Payments and Contribution Refunds	(58,604)
■ Miscellaneous Contributions and Disbursements	0
■ Expected Interest at 8.5%	<u>125,759</u>
■ Expected Market Value of Assets as of June 30, 2001	\$ 1,600,794
■ Actual Market Value of Assets as of June 30, 2001	<u>1,407,516</u>
■ Actuarial Investment Gain (Loss)	\$ (193,278)

Schedule of Actuarial Investment Gains (Losses)

Plan Year Ending	Initial Actuarial Gain (Loss)	Five-Year Amortization	Unrecognized Gain (Loss) as of July 1, 2000*
June 30, 2001	\$ (193,278)	\$ 38,656	\$ (154,622)
June 30, 2000	165,524	33,105	99,314
June 30, 1999	(70,960)	(14,192)	(28,384)
June 30, 1998	5,146	1,029	<u>1,029</u>
			\$ (82,663)

* Deferred for recognition in future years.

Actuarial Value of Assets

■ Market Value as of July 1, 2001	\$ 1,407,516
■ (Gain) Loss to be Recognized in Future Years	<u>82,663</u>
■ Actuarial Value as of July 1, 2001	\$ 1,490,179

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

	July 1, 2001	July 1, 2000
■ Actuarial Present Value of Future Benefits		
— Active participants	\$ 1,528,322	\$ 1,200,914
— DROP participants	119,205	92,470
— Vested terminated participants	33,327	25,459
— Retirees and beneficiaries	<u>652,369</u>	<u>528,682</u>
— Total	\$ 2,333,223	\$ 1,847,525
■ Actuarial Present Value of Future Employee Contributions	(57,111)	(54,724)
■ Actuarial Present Value of Future Normal Costs (City Portion)	<u>(320,306)</u>	<u>(283,428)</u>
■ Actuarial Accrued Liability	\$ 1,955,806	\$ 1,509,373
■ Actuarial Value of Assets	<u>(1,490,179)</u>	<u>(1,376,020)</u>
■ Unfunded Actuarial Accrued Liability (Surplus)	\$ 465,627	\$ 133,353

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

■ Unfunded Actuarial Accrued Liability (Surplus) as of July 1, 2000	\$	133,353
■ Expected Change due to Normal Operation		
— Normal cost (City portion)		32,247
— City contributions		(41,298)
— Interest		10,958
— Recognition of prior asset losses (gains)		<u>(35,829)</u>
— Net change	\$	(33,922)
■ Change due to Actuarial Experience		
— Actuarial (gain) loss from asset sources		38,656
— Actuarial (gain) loss from liability sources		<u>(19,896)</u>
— Net change	\$	18,760
■ Unfunded Actuarial Accrued Liability (Surplus) as of July 1, 2001 Before Changes		118,191
■ Change in Actuarial Assumptions		13,967
■ Change in Actuarial Methods		0
■ Change in Plan Provisions		<u>333,469</u>
■ Unfunded Actuarial Accrued Liability (Surplus) as of July 1, 2001	\$	465,627

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, 1991	\$ 688,322	\$ 558,144	81%	\$ 130,178	\$ 284,914	46%
July 1, 1992	765,299	608,524	80	156,775	314,686	50
July 1, 1993	840,321	660,637	79	179,684	340,249	53
July 1, 1994	886,699	713,696	80	173,003	366,561	47
July 1, 1995	963,712	770,189	80	193,523	378,511	51
July 1, 1996	1,042,459	857,332	82	185,127	367,610	50
July 1, 1998	1,240,141	1,095,617	88	144,524	397,698	36
July 1, 1999	1,339,933	1,222,240	91	117,693	407,733	29
July 1, 2000	1,509,373	1,376,020	91	133,353	432,604	31
July 1, 2001	1,955,806	1,490,179	76	465,627	418,234	111

Historical Solvency Test (\$000)

Actuarial Accrued Liability for:

Valuation Date	Employee Contributions (1)	Retirees, Beneficiaries, Vested Terminated and DROP Participants (2)	Active Participants (City- Financed Portion) (3)	Actuarial Value of Assets	Portion of Actuarial Accrued Liability Covered by Assets		
					(1)	(2)	(3)
July 1, 1991	\$ 32,606	\$ 289,174	\$ 366,542	\$ 558,144	100%	100%	64%
July 1, 1992	32,850	317,849	414,600	608,524	100	100	62
July 1, 1993	32,866	369,561	437,894	660,637	100	100	59
July 1, 1994	32,410	384,100	470,189	713,696	100	100	63
July 1, 1995	31,130	420,830	511,752	770,189	100	100	62
July 1, 1996	45,819	438,486	558,154	857,332	100	100	67
July 1, 1998	34,781	502,335	703,025	1,095,617	100	100	79
July 1, 1999	33,985	599,270	706,678	1,222,240	100	100	83
July 1, 2000	38,292	646,611	824,470	1,376,020	100	100	84
July 1, 2001	36,449	804,901	1,114,456	1,490,179	100	100	58

City Contribution Rate

	July 1, 2001 through June 30, 2002	July 1, 2000 through June 30, 2001
■ City Normal Cost Rate	10.0%	7.5%
■ Rate to Amortize Unfunded Actuarial Accrued Liability (Surplus) Over 40 Years from January 1, 1983	<u>7.7</u>	<u>2.0</u>
■ Preliminary City Contribution Rate	17.7%	9.5%
■ Additional Statutory Requirement	<u>0.0</u>	<u>0.5</u>
■ Final City Contribution Rate	17.7%	10.0%

Change in City Contribution Rate Since the Prior Valuation

■ City Contribution Rate as of July 1, 2000	9.5%
■ Change in the City Contribution Rate	
— Recognition of prior asset losses (gains)	(0.6)
— Actuarial (gain) loss from asset sources	0.6
— Actuarial (gain) loss from liability sources	(0.1)
— Change in actuarial assumptions	(0.7)
— Change in plan provisions	9.0
— Change in actuarial methods	<u>0.0</u>
■ City Contribution Rate as of July 1, 2001	17.7%

Historical City Contributions as a Percentage of Covered Payroll

Actuarially Calculated City Contribution Rate		Actual City Contribution Rate	
Valuation Date	Rate	Period	Rate
July 1, 1987	5.83%	January 1, 1988 through December 31, 1988	5.15%
July 1, 1988	6.27	January 1, 1989 through December 31, 1989	5.15
July 1, 1989	6.88	January 1, 1990 through December 31, 1990	6.27
July 1, 1990	6.23	January 1, 1991 through December 31, 1991	6.27
July 1, 1991	8.77	January 1, 1992 through June 30, 1993	6.27
July 1, 1992	9.11	July 1, 1993 through June 30, 1994	9.11
July 1, 1993	9.3	July 1, 1994 through June 30, 1995	9.3
July 1, 1994	8.8	July 1, 1995 through June 30, 1996	8.8
July 1, 1995	9.2*	July 1, 1996 through June 30, 1997	9.2
July 1, 1996	9.1	July 1, 1997 through June 30, 1998	9.1
July 1, 1998	9.3	July 1, 1998 through June 30, 1999	9.1
July 1, 1999	9.8*	July 1, 1999 through June 30, 2000	9.3
July 1, 2000	9.5	July 1, 2000 through June 30, 2001	10.0
July 1, 2001	17.7	July 1, 2001 through June 30, 2002	

*Average for the year.

Note: Since January 1, 1983, the actual City contribution rate has been based on results of actuarial valuations prepared at least every three years.

Projection of Estimated Assets and Liabilities (\$000)

Year Beginning July 1	Annual Covered Payroll	City Contributions	City Contribution Rate*	Employee Contributions	Benefit Payments	Net Cash Flow	Market Value of Assets at Beginning of Year	Unfunded Actuarial Liability (Surplus) at Beginning of Year
2001	\$ 418,234	\$ 41,823	10.0%	\$ 7,346	\$ 67,111	\$ (17,942)	\$ 1,407,516	\$ 465,628
2002	437,054	77,359	17.7	7,677	76,735	8,301	1,508,467	531,130
2003	456,722	84,950	18.6	8,022	86,359	6,613	1,645,333	566,592
2004	477,274	91,637	19.2	8,384	95,984	4,037	1,792,075	583,348
2005	498,752	96,758	19.4	8,761	105,608	(89)	1,948,606	629,347
2006	521,195	104,760	20.1	9,155	115,232	(1,317)	2,114,144	634,226
2007	544,649	109,474	20.1	9,567	118,834	207	2,292,475	633,531
2008	569,158	114,401	20.1	9,997	130,631	(6,233)	2,487,551	630,321
2009	594,771	119,549	20.1	10,447	143,591	(13,595)	2,692,501	624,270
2010	621,535	124,929	20.1	10,918	156,535	(20,688)	2,907,204	615,021
2011	649,504	130,550	20.1	11,409	172,121	(30,162)	3,132,766	602,183
2012	678,732	136,425	20.1	11,922	186,378	(38,031)	3,367,633	585,323
2013	709,275	143,274	20.2	12,459	201,731	(45,998)	3,614,268	563,967
2014	741,192	149,721	20.2	13,019	218,562	(55,822)	3,873,567	536,858
2015	774,546	156,458	20.2	13,605	234,592	(64,529)	4,144,674	504,067
2016	809,401	163,499	20.2	14,217	252,742	(75,026)	4,429,757	464,960
2017	845,824	170,856	20.2	14,857	269,654	(83,941)	4,728,137	418,842
2018	883,886	178,545	20.2	15,526	286,279	(92,208)	5,042,593	364,949
2019	923,661	186,579	20.2	16,224	303,312	(100,509)	5,375,167	302,448
2020	965,225	194,975	20.2	16,955	320,183	(108,253)	5,727,363	230,426

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

Summary of Active Participants as of July 1, 2001

Contributory Plan

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	38								38
Tot Earnings	709,163								709,163
Avg Earnings	18,662								18,662
20-24									
Number	268	1							269
Tot Earnings	5,551,816	32,021							5,583,837
Avg Earnings	20,716	32,021							20,758
25-29									
Number	361	29							390
Tot Earnings	8,681,551	733,798							9,415,349
Avg Earnings	24,049	25,303							24,142
30-34									
Number	353	73	35	3					464
Tot Earnings	8,983,986	2,194,629	1,034,349	95,693					12,308,657
Avg Earnings	25,450	30,063	29,553	31,898					26,527
35-39									
Number	370	100	90	70	18				648
Tot Earnings	9,662,906	3,056,496	2,986,815	2,314,355	551,760				18,572,332
Avg Earnings	26,116	30,565	33,187	33,062	30,653				28,661
40-44									
Number	324	115	106	139	252	10			946
Tot Earnings	8,390,748	4,030,069	3,636,391	4,866,901	8,505,479	377,516			29,807,104
Avg Earnings	25,897	35,044	34,306	35,014	33,752	37,752			31,509
45-49									
Number	248	99	115	151	292	121	3		1,029
Tot Earnings	6,944,149	3,646,690	4,649,403	6,374,452	10,446,576	4,479,076	100,240		36,640,586
Avg Earnings	28,001	36,835	40,430	42,215	35,776	37,017	33,413		35,608
50-54									
Number	236	91	78	148	211	141	32		937
Tot Earnings	7,244,255	3,475,246	3,398,268	6,184,785	8,128,131	6,315,411	1,385,399		36,131,495
Avg Earnings	30,696	38,190	43,568	41,789	38,522	44,790	43,294		38,561
55-59									
Number	130	57	54	89	109	58	11	1	509
Tot Earnings	4,265,219	2,297,962	2,356,450	3,497,237	4,402,599	2,378,890	458,352	38,402	19,695,111
Avg Earnings	32,809	40,315	43,638	39,295	40,391	41,015	41,668	38,402	38,694
60-64									
Number	55	28	28	31	44	20	9		215
Tot Earnings	1,859,698	1,174,321	1,352,558	1,215,330	1,732,720	889,035	303,447		8,527,110
Avg Earnings	33,813	41,940	48,306	39,204	39,380	44,452	33,716		39,661
Over 64									
Number	14	11	8	2	9	13		2	59
Tot Earnings	544,980	447,280	293,213	93,623	415,094	658,451		59,588	2,512,229
Avg Earnings	38,927	40,662	36,652	46,811	46,122	50,650		29,794	42,580
Total									
Number	2,397	604	514	633	935	363	55	3	5,504
Tot Earnings	62,838,470	21,088,514	19,707,447	24,642,375	34,182,360	15,098,380	2,247,437	97,990	179,902,973
Avg Earnings	26,215	34,915	38,341	38,930	36,559	41,593	40,862	32,663	32,686

Average Age = 43.9 Average Service = 10.5

Summary of Active Participants as of July 1, 2001 (cont.)

Noncontributory Plan

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 Earnings								
	Avg Earnings								
20-24	121	12							133
	2,565,938	299,581							2,865,520
	21,206	24,965							21,545
25-29	273	179	7						459
	6,565,227	4,511,079	198,803						11,275,109
	24,048	25,202	28,400						24,565
30-34	299	405	185	5					894
	7,806,141	11,398,551	5,047,025	128,028					24,379,745
	26,107	28,145	27,281	25,606					27,270
35-39	256	406	368	173	6				1,209
	7,141,331	12,155,845	11,361,682	5,071,584	146,005				35,876,447
	27,896	29,941	30,874	29,316	24,334				29,674
40-44	229	440	324	256	111	3			1,363
	6,755,304	13,962,104	10,922,604	8,527,647	3,620,470	130,208			43,918,337
	29,499	31,732	33,712	33,311	32,617	43,403			32,222
45-49	202	397	309	245	122	54	1		1,330
	6,257,809	13,036,563	10,541,745	8,148,314	4,235,177	1,835,632	23,560		44,078,801
	30,979	32,838	34,116	33,258	34,715	33,993	23,560		33,142
50-54	122	305	236	226	69	43	6		1,007
	3,844,309	10,336,182	8,294,370	8,135,498	2,528,253	1,665,207	221,280		35,025,097
	31,511	33,889	35,146	35,998	36,641	38,726	36,880		34,782
55-59	69	221	159	146	46	21	6	1	669
	2,200,617	7,234,635	5,562,054	5,175,268	1,706,497	808,444	168,297	22,539	22,878,351
	31,893	32,736	34,981	35,447	37,098	38,497	28,049	22,539	34,198
60-64	21	99	71	61	11	5	1		269
	629,113	3,308,409	2,740,950	2,106,443	387,421	213,914	40,720		9,426,970
	29,958	33,418	38,605	34,532	35,220	42,783	40,720		35,044
Over 64	8	30	21	16	11	3	2		91
	245,420	1,121,308	733,641	643,056	430,312	111,482	107,912		3,393,130
	30,677	37,377	34,935	40,191	39,119	37,161	53,956		37,287
Total	1,600	2,494	1,680	1,128	376	129	16	1	7,424
	44,011,209	77,364,256	55,402,873	37,935,838	13,054,135	4,764,887	561,768	22,539	233,117,506
	27,507	31,020	32,978	33,631	34,718	36,937	35,111	22,539	31,401

Average Age = 43.9

Average Service = 10.2

Summary of Active Participants as of July 1, 2001 (cont.)

Total

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	38								38
Tot Earnings	709,163								709,163
Avg Earnings	18,662								18,662
20-24									
Number	389	13							402
Tot Earnings	8,117,754	331,603							8,449,357
Avg Earnings	20,868	25,508							21,018
25-29									
Number	634	208	7						849
Tot Earnings	15,246,778	5,244,877	198,803						20,690,457
Avg Earnings	24,049	25,216	28,400						24,370
30-34									
Number	652	478	220	8					1,358
Tot Earnings	16,790,127	13,593,180	6,081,374	223,721					36,688,402
Avg Earnings	25,752	28,438	27,643	27,965					27,016
35-39									
Number	626	506	458	243	24				1,857
Tot Earnings	16,804,237	15,212,341	14,348,497	7,385,939	697,766				54,448,779
Avg Earnings	26,844	30,064	31,329	30,395	29,074				29,321
40-44									
Number	553	555	430	395	363	13			2,309
Tot Earnings	15,146,051	17,992,172	14,558,995	13,394,548	12,125,949	507,724			73,725,440
Avg Earnings	27,389	32,418	33,858	33,910	33,405	39,056			31,930
45-49									
Number	450	496	424	396	414	175	4		2,359
Tot Earnings	13,201,959	16,683,253	15,191,148	14,522,766	14,681,753	6,314,709	123,800		80,719,387
Avg Earnings	29,338	33,636	35,828	36,674	35,463	36,084	30,950		34,218
50-54									
Number	358	396	314	374	280	184	38		1,944
Tot Earnings	11,088,564	13,811,428	11,692,637	14,320,283	10,656,384	7,980,618	1,606,679		71,156,593
Avg Earnings	30,974	34,877	37,238	38,290	38,059	43,373	42,281		36,603
55-59									
Number	199	278	213	235	155	79	17	2	1,178
Tot Earnings	6,465,836	9,532,597	7,918,504	8,672,505	6,109,095	3,187,334	626,648	60,941	42,573,461
Avg Earnings	32,492	34,290	37,176	36,904	39,414	40,346	36,862	30,471	36,140
60-64									
Number	76	127	99	92	55	25	10		484
Tot Earnings	2,488,811	4,482,731	4,093,508	3,321,774	2,120,142	1,102,949	344,167		17,954,081
Avg Earnings	32,748	35,297	41,349	36,106	38,548	44,118	34,417		37,095
Over 64									
Number	22	41	29	18	20	16	2	2	150
Tot Earnings	790,399	1,568,588	1,026,854	736,679	845,406	769,933	107,912	59,588	5,905,359
Avg Earnings	35,927	38,258	35,409	40,927	42,270	48,121	53,956	29,794	39,369
Total									
Number	3,997	3,098	2,194	1,761	1,311	492	71	4	12,928
Tot Earnings	106,849,679	98,452,770	75,110,321	62,578,214	47,236,495	19,863,267	2,809,205	120,529	413,020,480
Avg Earnings	26,732	31,779	34,234	35,536	36,031	40,372	39,566	30,132	31,948

Average Age = 43.9 Average Service = 10.3

Historical Active Participant Data

Valuation Data	Number of Participants	Average Age	Annual Payroll (\$000)	Average Annual Salary	Annual Percentage Increase in Average Salary
January 1, 1982	12,338	N/A	\$ 207,100	\$ 16,906	15.1%
July 1, 1984	12,407	N/A	227,000	18,429	3.5
July 1, 1986	11,459	N/A	234,300	20,342	5.1
July 1, 1987	12,149	N/A	239,500	19,832	(2.5)
July 1, 1988	11,344	N/A	227,900	19,934	0.5
July 1, 1989	11,356	N/A	235,400	20,771	4.2
July 1, 1990	12,037	40.0	258,556	21,480	3.4
July 1, 1991	12,488	40.3	284,914	22,815	6.2
July 1, 1992	12,913	40.5	314,686	24,370	6.8
July 1, 1993	13,112	40.9	340,249	25,949	6.5
July 1, 1994	14,027	40.9	366,561	26,133	0.7
July 1, 1995	14,364	41.3	378,511	26,351	0.8
July 1, 1996	14,067	41.8	367,610	26,133	(0.8)
July 1, 1998*	13,764	42.8	394,919	28,692	9.8
July 1, 1999*	13,286	42.9	396,617	29,852	4.0
July 1, 2000*	13,126	43.7	421,591	32,119	7.6
July 1, 2001*	12,928	43.9	413,021	31,948	(0.5)

* Excludes DROP participants.

Summary of Inactive Participants as of July 1, 2001

	Number	Annual Benefits (\$000)	Average Annual Benefit
■ DROP Participants*	281	\$ 4,726	\$ 16,817
■ Retirees	3,585	46,867	13,073
■ Beneficiaries	1,360	7,455	5,482
■ Disabled Participants	512	3,555	6,943
■ Deferred Vesteds	<u>1,226</u>	<u>6,360</u>	5,188
■ Total	6,964	\$ 68,963	\$ 10,040

* Annual payroll for DROP participants is \$5,213,284.

Retirees, Beneficiaries and Disabled Participants Added to and Removed from Rolls

Period Ended	Added to Rolls		Removed from Rolls		Rolls at the End of the Year		Average Annual Benefit
	Number	Annual Benefits (\$000)	Number	Annual Benefits (\$000)	Number	Annual Benefits (\$000)	
June 30, 1993	473	\$ 3,714	309	\$ 1,534	4,189	\$ 32,419	\$ 7,739
June 30, 1994	306	2,474	227	1,593	4,268	33,971	7,959
June 30, 1995	393	3,044	220	1,307	4,441	36,482	8,215
June 30, 1996	416	3,119	239	1,438	4,618	38,815	8,405
June 30, 1998	693	5,840	441	3,212	4,870	43,394	8,910
June 30, 1999	432	2,131	303	1,515	4,999	46,732	9,348
June 30, 2000	360	3,412	255	1,380	5,104	49,970	9,755
June 30, 2001	652	8,937	299	1,030	5,457	57,877	10,606

Summary of Actuarial Methods and Assumptions

The following methods and assumptions were adopted for the July 1, 2000 actuarial valuation.

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 of Assets over five years.

Actuarial Cost Method

Entry Age Method with liabilities allocated from date of entry to age 70. 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 payments.

Economic Assumptions

■ Investment Return	8.5% per year, net of expenses
■ Individual Pay Increase Rate	4.5% per year
■ Payroll Growth Rate	4.5% per year
■ General Inflation Rate	4.0% per year

Demographic Assumptions

■ Retirement Rate

<i>Age</i>	<i>Rate</i>
<55	5%
56-59	5
60	10
61	10
62	25
63	10
64	10
65	40
66-69	10
70+	100

■ DROP Participation

50% of eligible members assumed to elect DROP

■ DROP Entry Date

Five years prior to assumed retirement date

Summary of Actuarial Methods and Assumptions (cont.)

- **Mortality Rates**
 - Active participants and nondisabled retirees 1994 Group Annuity Mortality Table (see table below for sample rates).
 - Disabled retirees 1987 Commissioners Group Disabled Mortality Table (see table below for sample rates).
- **Disability Rates** Graduated rates (see table below for sample rates).
- **Percentage of Service-Connected Deaths and Disabilities** 10%
- **Termination Rates** Graduated rates (see table below for sample rates).
- **Rehire Rates** Each year 2% of the nonvested terminations are assumed to be rehired in the future.
- **Marital Status at Benefit Eligibility**
 - Percentage married 60%. (No beneficiaries other than the spouse assumed).
 - Age difference Husbands assumed to be three years older than wives.
- **Valuation Payroll** Pay reported by the City for the 12 months prior to the valuation date projected with one year of assumed pay increases.

Missing Data Assumptions

- **Current Age:**
 - Active participants Contributory Plan – 44.9
Noncontributory Plan – 43.1
 - Retirees and spouses 65
 - Deferred vested participants 40
- **Service for Active Participants** Contributory Plan – 12.3
Noncontributory Plan – 9.3
- **Pay** Contributory Plan - \$35,789
Noncontributory Plan - \$32,850

Summary of Actuarial Methods and Assumptions (cont.)

■ Form of Payment:

Contributory Plan

- Retirees and spouses 75% joint and survivor annuity
- Deferred vested participants 50% joint and survivor annuity

Noncontributory Plan

- Retirees and spouses 75% joint and survivor annuity
- Deferred vested participants 50% joint and survivor annuity

Sample Rates Per 100 Participants

Age	<u>Nondisabled Mortality</u>		<u>Disabled Mortality (Ultimate)</u>	<u>Termination</u>		<u>Disability</u>
	Male	Female	All	First 3 Years	After 3 Years	All
20	0.05	0.03	2.82	36.20	21.20	0.05
25	0.07	0.03	2.82	30.80	15.80	0.05
30	0.08	0.04	2.82	26.60	11.60	0.05
35	0.09	0.05	2.82	23.40	8.40	0.06
40	0.11	0.07	2.82	21.20	6.20	0.09
45	0.16	0.10	2.82	19.20	4.20	0.18
50	0.26	0.14	2.82	17.60	2.60	0.40
55	0.44	0.23	2.82	0.00	0.00	0.85
60	0.80	0.44	3.14	0.00	0.00	1.74

Changes in Methods and Assumptions Since the Prior Valuation

The actuarial methods and assumptions used in this valuation are the same as those used in the prior valuation except for the following:

- The assumed pay increase rate from 5.5% to 4.5%
- The assumed payroll growth rate from 5.0% to 4.5%
- The assumed rate of general inflation from 4.5% to 4.0%

In addition, the assumed retirement rates and DROP participation rate were changed to better reflect anticipated experience.

Summary of Plan Provisions

■ Covered Members

Any person who is a participant of Group A, under the original act.

Persons who become employees of the City of Houston after September 1, 1981, and elected officials of the City of Houston who assumed office after September 1, 1981, participate in Group B, but may make an irrevocable election to participate in Group A instead.

Persons who become employees of the City and persons who are elected as City officials after September 1, 1999 become members of Group A. Certain persons who are or become Director of a City Department, Chief Financial Executive, or Executive Director of the Pension System on or after September 1, 1999 may participate in Group C.

■ Monthly Final Average Salary (FAS)

The sum of the seventy-eight highest biweekly salaries paid to a member during his period of credited service, divided by thirty-six. Salary includes base pay, longevity pay, and any shift differential pay.

■ Credited Service

All services and work performed by an employee, including prior service. For members of Group A and Group C, all services and work performed after September 1, 1943 must have been accompanied by corresponding contributions to the Pension System by the employee or legally authorized repayments must have been made.

Credited service for participants in Group C means the number of eligible service after the executive official's effective date of participation in Group C. A Group C member receives two times the number of actual Credited Service in Group C solely for the purpose of fulfilling the eligibility requirements in Group C.

Summary of Plan Provisions (cont.)

■ Normal Retirement

— Eligibility

Prior to August 1, 2000:

The earliest of:

- age 50 and 25 years of Credited Service
- age 55 and 20 years of Credited Service
- age 60 and 10 years of Credited Service
- age 62 and 5 years of Credited Service
- age 65 (Group C only)

On or after August 1, 2000:

The earliest of:

- age 62 and 5 years of Credited Service
- 5 years of Credited Service and age plus years of Credited Service equal 70 or more
- age 65 (Group C only)

— Benefit

Prior to August 1, 2000:

Group A: 2.25% of FAS for each of the first 20 years of Credited Service, plus 2.75% of FAS for each year of Credited Service over 20, to a maximum of 80% of FAS. Minimum monthly benefit is greater of \$8 times years of Credited Service or \$100.

Group B: 1.50% of FAS for each of first 10 years of Credited Service, plus 1.75% of FAS for each year of Credited Service over 10 through 20, plus 2.00% of FAS for each year of Credited Service over 20, to a maximum of 80% of FAS.

Summary of Plan Provisions (cont.)

On or after August 1, 2000 and prior to
May 11, 2001:

Group A: 2.50% of FAS for each of the first 20 years of Credited Service plus 3.25% of FAS for each year of Credited Service greater than 20 years. Maximum benefit is 80% of FAS. Minimum monthly benefit is greater of \$8 times years of Credited Service or \$100.

Group B: 1.75% of FAS for each of the first 10 years of Credited Service plus 2.00% of FAS for each year of Credited Service from 10 through 20, and 2.50% of FAS for each year of Credited Service over 20. Maximum benefit is 80% of FAS for all future retirees.

Group C: Double the rate for Group A

On or after May 11, 2001:

Group A: 3.25% of FAS for each of the first 10 years of Credited Service plus 3.50% for Credited Service greater than 10 years but less than 20 years plus 4.25% for FAS for each year of Credited Service greater than 20 years (excludes current DROP participants). Maximum benefit is 90% of FAS for all future retirees. Minimum monthly benefit is greater of \$8 times years of Credited Service or \$100.

Group B: 1.75% of FAS for each of the first 10 years of Credited Service plus 2.00% of FAS for each year of Credited Service from 10 through 20, and 2.75% of FAS for each year of Credited Service over 20. Maximum benefit is 90% of FAS for all future retirees.

Group C: Double the rate for Group A

■ Vested Pension

— Eligibility

5 years of Credited Service. Immediate for Group C.

Summary of Plan Provisions (cont.)

- Benefit

Group A and Group C: Either the accrued normal retirement benefit with payments beginning at the normal retirement eligibility date or a refund of contributions, if any, without interest.

Group B: Accrued normal retirement benefit payable at the normal retirement eligibility date.

If the actuarial present value of a pension is less than \$10,000, a terminated participant who is not eligible to begin receiving a pension may request an early lump sum distribution of the pension. Such early lump sum distribution is irrevocable. Credited Service associated therewith can be reinstated after reemployment and pursuant to rules of the plan.

- Withdrawal Benefit

If a nonvested member withdraws from service with less than 5 years, a refund of the member's contributions is made without interest, upon request.

- Service-Connected Disability Retirement

- Eligibility

Any age or Credited Service.

- Benefit

Group A: Accrued normal retirement benefit, but not less than 20% of final monthly salary at time of disability plus 1% of final monthly salary per year of Credited Service, to a maximum of 40% of final monthly salary.

Group B: Accrued normal retirement benefit, but not less than 20% of final monthly salary at time of disability.

Group C: Double Group A benefit

- Nonservice-Connected Disability Retirement

- Eligibility

5 years of Credited Service.

- Benefit

Accrued normal retirement benefit payable immediately.

Summary of Plan Provisions (cont.)

■ Preretirement Survivor Benefits

— Service-connected

– Eligibility

Any age or Credited Service.

– Benefit

Prior to September 1, 1999:

If there is a surviving spouse, 80% of FAS payable to the spouse plus 10% of FAS to each qualifying dependent to a maximum of 20% for all dependents. If there is no surviving spouse, dependent benefits are doubled.

On or after September 1, 1999:

If there is a surviving spouse, 100% of FAS payable to the spouse. 10% of FAS is payable to each qualifying dependent to a maximum of 20% for all dependents. Surviving spouses benefit will be reduced by the amount of dependent benefits. If no surviving spouse, dependent benefits are 50% of the amount a surviving spouse would have received for each dependent to a maximum of 100% for all dependents in the aggregate.

— Nonservice-connected

– Eligibility

5 years of Credited Service.

– Benefit

Prior to September 1, 1999:

If there is a surviving spouse, 50% of accrued normal retirement benefit payable to the spouse plus 10% of accrued normal retirement benefit to each qualifying dependent to a maximum of 20% for all dependents. If there is no surviving spouse, dependent benefits are doubled.

Summary of Plan Provisions (cont.)

On or after September 1, 1999 and prior to August 1, 2001:

If there is a surviving spouse, 85% of accrued normal retirement benefit payable to the spouse plus 10% of accrued normal retirement benefit to each qualifying dependent to a maximum of 20% for all dependents in the aggregate. The surviving spouse's benefit will be reduced by the excess, if any, over 100% of the accrued normal retirement benefit. If there is no surviving spouse, dependent benefits are 50% of the benefit a surviving spouse would have received for each dependent subject to 100% of a surviving spouse's benefit for all dependents in the aggregate.

On or after August 1, 2001:

If there is a surviving spouse, 100% of accrued normal retirement benefit payable to the spouse and 10% of accrued normal retirement benefit to each qualifying dependent to a maximum of 20% for all dependents in the aggregate. The surviving spouse's benefit will be reduced by dependent benefits, if any. If there is no surviving spouse, each dependent will receive 50% of the benefit of a surviving spouse would have received subject to a maximum of 100% of a surviving spouse's benefit for all dependents in the aggregate.

■ Postretirement Survivor Benefits

Prior to September 1, 1999:

If there is a surviving spouse, 75% of the retirement benefit the deceased retiree was receiving at the time of death payable to the spouse plus 10% of that retirement benefit payable to each qualifying dependent to a maximum of 20% for all dependents. If there is no surviving spouse, dependent benefits are double.

Summary of Plan Provisions (cont.)

On or after September 1, 1999 and prior to August 1, 2001:

If there is a surviving spouse, 85% of the retirement benefit the deceased retiree was receiving at the time of death payable to the spouse plus 10% of that retirement benefit payable to each qualifying dependent to a maximum of 20% for all dependents. If there is no surviving spouse, dependent benefits are 50% of the benefit a surviving spouse would have received for each dependent subject to 100% of a surviving spouse's benefit for all dependents in the aggregate.

On or after August 1, 2001:

If there is a surviving spouse, 100% of the retirement benefit if the deceased retiree was receiving at the time of death payable to the spouse and 10% of that retirement benefit payable to each qualifying dependent to a maximum of 20% for all dependents. The surviving spouse's benefit will be reduced by dependent benefits, if any. If there is no surviving spouse, each dependent will receive 50% of the benefit a surviving spouse would have received subject to 100% of a surviving spouse's benefit for all dependents in the aggregate.

■ Benefit Adjustments

Prior to May 11, 2001:

Each year, effective February 1, monthly benefits will be increased 3.5%, not compounded, for all retirees and survivors whose benefit was effective on or before January 1 of the current year.

On or after May 11, 2001:

Each year, effective February 1, monthly benefits will be increased 4.0%, not compounded, for all retirees and survivors whose benefit was effective on or before January 1 of the current year.

Summary of Plan Provisions (cont.)

■ Contribution Rates.

— Members

4% of salary only for the Group A and Group C members. None for the Group B members.

— City

Beginning in 1993, the rate required to fund the Retirement Fund on an actuarial reserve basis. However, effective September 1, 1999, the minimum contribution rate is equal to the greater of 10% and twice the contribution rate of a Group A members is required to make by statute.

■ Deferred Retirement Option Program (DROP)

— Eligibility

Participants who are eligible to retire but who have not retired and who remain in service with the City may participate in the DROP.

— Monthly DROP Credit

Accrued normal retirement benefit as of the effective date of DROP participation. The Monthly DROP Credit is credited to a notional account (DROP Account) on the last business day each month.

— Other DROP Credits

A participant's biweekly employee contributions, if any, are credited to the DROP Account on the day they are paid to the Pension System by the City. In addition, interest is credited to the DROP Account at the beginning of each day based on the DROP Account balance at the end of the previous day. The annual interest rate effective beginning January 1 each year is the arithmetical average of the System's annual investment return percentage for the then most recent 5 fiscal years. Minimum interest rate is the investment yield assumption for actuarial purposes adopted by the Pension Board as of interest calculation date. The interest rate for interest accrued after a DROP participant's City employment is terminated, if applicable, is reduced 3/4%.

Summary of Plan Provisions (cont.)

— Monthly DROP Credit Adjustments

Prior to May 11, 2001:

The Monthly DROP Credit for participants who entered the DROP effective on or before January 1 of the then current year will be increased effective February 1 each year 3.5%, not compounded.

On or after May 11, 2001:

The Monthly DROP Credit for participants who entered the DROP effective on or before January 1 of the then current year will be increased effective February 1 each year 4.0%, not compounded.

— DROP Account Balance (DROP Benefit)

The sum of a participant's Monthly DROP Credits, employee contributions paid after DROP participation began, Monthly DROP Credit Adjustments, and applicable interest.

— DROP Benefit Pay-out

A terminated DROP participant may elect to:

1. Receive the entire DROP Account Balance in lump sum.
2. Receive the DROP Account Balance in periodic payments as approved by the Pension Board.
3. Receive a portion of the DROP Account Balance in lump sum and the remainder in periodic payments as approved by the Pension Board.
4. Defer election of a payout option until a future date.

— Post DROP Retirement Benefit (Final Pension)

The Final Pension is the accrued benefit percentage as of the effective date of DROP participation times the FAS as of termination from active service. The initial monthly retirement pension is equal to the Final Pension plus the Monthly DROP Credit Adjustments the participant received while in DROP.

Changes in Plan Provisions Since Prior Year

Plan provisions have changed since the prior year. The details of the changes are described above.

Plan Provisions Effective After July 1, 2001

No future plan changes have been recognized.

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 is accurate and fairly presents the actuarial position of the Pension System as of July 1, 2001.

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. Historical information for years prior to 1993 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 Pension System and to reasonable expectations.

Towers Perrin



Alan S. Taper, F.S.A., M.A.A.A.

November, 2001