Gabriel Roeder Smith & Company
Consultants & Actuaries

HOUSTON MUNICIPAL EMPLOYEES PENSION SYSTEM

ACTUARIAL VALUATION REPORT

FOR THE YEAR BEGINNING JULY 1, 2015

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Board of Trustees
Houston Municipal Employees Pension System
1201 Louisiana
Suite 900
Houston, TX 77002

Subject: Actuarial Valuation as of July 1, 2015

Dear Members of the Board:

This report describes the current actuarial condition of the Houston Municipal Employees Pension System (HMEPS), determines the calculated employer contribution rate, and analyzes changes in this contribution rate. The results presented herein may not be applicable for other purposes. Valuations are prepared annually, as of July 1, the first day of the HMEPS plan year.

Under the HMEPS statute, the employer contribution rate is determined actuarially, based on the Board's funding policy and HMEPS' governing law. The contribution rate determined by a given actuarial valuation and implemented by the Board becomes effective twelve months after the valuation date, i.e., the rates determined by this July 1, 2015 actuarial valuation will be used by the Board when determining the employer contribution rate for the year beginning July 1, 2016 and ending June 30, 2017.

Under the Amended and Restated Meet & Confer Agreement (ARM&CA) between the Board and the City of Houston, the City will contribute the greater of the 2015 fiscal year contribution increased by $10 million or 27.36% of payroll in fiscal year 2016. Contributions in future fiscal years will increase by the greater of the prior fiscal year's contribution amount increased by $10 million or 2% of payroll over the prior year's rate until such time that the City's contribution rate equals the actuarially determined contribution rate. As part of the agreement the Board's funding policy has been modified to use an open 30-year rolling amortization period until such time that the City's actual contribution rate is equal to the actuarially determined contribution rate, at which point the funding period will be closed.

Under the terms of the ARM&CA and based on an estimated payroll of $590.7 million, the estimated City contribution for FY 2016 is $161.6 million (27.36% of pay) and based on an estimated payroll of $608.4 million, the estimated City contribution for FY 2017 is $178.6 million (29.36% of pay).

Financing objectives and funding policy

The amortization period is set by statute, and was modified under the ARM&CA. The contribution rate and liabilities are computed using the Entry Age Normal actuarial cost method. The employer contribution rate is the sum of two pieces: the employer normal cost rate and the amortization rate. Both the normal cost rate and the amortization rate are determined as a level percentage of pay. The amortization rate is the amount required to amortize the unfunded actuarial accrued liability over an open 30-year period. The amortization rate is adjusted for the one-year deferral in contribution rates. The amortization period will remain open until the actual employer contribution rate is equal to the actuarially determined employer contribution rate.

Progress toward realization of financing objectives

The funded ratio (the ratio of the actuarial value of assets to the actuarial accrued liability) is a standard measure of a plan's funded status. In the absence of benefit improvements, it should increase over time, until it reaches 100%. The funded ratio as of July 1, 2015 is 54.2%. This is a decrease from the 58.1% funded ratio from the prior year's valuation. The funded status alone is not appropriate for assessing the need for or the amount of future contributions and is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

The calculated employer contribution rate for FY 2017 is 31.81%. This rate is greater than the 27.38% rated calculated in the 2014 valuation. This increase is mostly due to the change in actuarial assumptions. Please see Table 6 for a detailed analysis of the change in the calculated employer contribution rate from the prior year to this year.

Plan Experience

As part of each valuation, we examine the System's experience relative to the assumptions. The aggregate results of these analyses are disclosed in Tables 5 & 6. This past fiscal year the System had a total liability gain of approximately $13.1 million.

Benefit provisions

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2015. The Fourth Amendment to the Meet and Confer Agreement between the City and the Board changed the benefit provisions substantially, effective January 1, 2008. Under the Fourth Amendment, the benefits for employees hired prior to January 1, 2008 were not modified, but the benefits for employees newly hired on or after January 1, 2008 were modified substantially, including the elimination of member contributions. There have been no changes in the benefit provisions since the prior valuation date that have a material financial impact on HMEPS.

The benefit provisions are summarized in Appendix B.

Assumptions and methods

Actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary. The current assumptions were adopted by the Board in 2016 following a regularly scheduled experience study. The rationale for all of the current assumptions is included in that report, dated February 25, 2016.

The actuarial assumptions represent estimates of future experience and are not market measures. The results of the actuarial valuation are dependent on the actuarial assumptions used. Actual results (and future measures) can and almost certainly will differ, as actual experience deviates from the assumptions. Even seemingly minor changes in the assumptions can materially change the liabilities, calculated contribution rates and funding periods. The actuarial calculations are intended to provide information for rational decision making.

This report does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

All assumptions and methods are described in Appendix A.

GASB 67

The System was required to begin complying with Governmental Accounting Standards Board Statement No. 67 with the fiscal year ending June 30, 2014. The GASB No. 67 information for the fiscal year ending June 30, 2015 was provided to HMEPS in a separate report dated September 28, 2015 and is not contained in this report.

Data

Member data for retired, active and inactive members was supplied as of July 1, 2015 by the HMEPS staff. We did not audit this data, but we did apply a number of tests to the data, and we concluded that it was reasonable and consistent with the prior year's data.

Asset information as of July 1, 2015 was taken from the Comprehensive Annual Financial Report (CAFR) for the Year Ended June 30, 2015.

Certification

We were asked to determine if an unanticipated actuarial cost occurred in the administration of the Deferred Retirement Option Plan (DROP). It is our opinion that the administration of the DROP had no material unanticipated actuarial costs during the prior fiscal year.

All of the tables contained in this actuarial valuation report were prepared by Gabriel, Roeder, Smith & Company. The trend data schedules shown in the Notes section of the HMEPS CAFR are based on our valuation reports, but were prepared by HMEPS staff. We certify that the information presented herein is accurate and fairly portrays the actuarial position of HMEPS as of July 1, 2015.

All of our work conforms with generally accepted actuarial principles and practices, and the Actuarial Standards of Practice issued by the Actuarial Standards Board. In our opinion, our calculations also comply with the requirements of state law and, where applicable, the Internal Revenue Code, ERISA, and the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. Mr. Newton is an Enrolled Actuary and also a Member of the American Academy of Actuaries, and meets the Qualification Standards of the American Academy of Actuaries. Both of the undersigned are experienced in performing valuations for large public retirement systems.

Sincerely,
Gabriel, Roeder, Smith & Company

Joe Newton

Joseph P. Newton, FSA, EA, MAAA
Senior Consultant

Lewis Ward

Lewis Ward
Consultant

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Executive Summary

Item	July 1, 2015	July 1, 2014
Membership		
• Number of:		
- Active members	11,827	11,949
- Retirees and beneficiaries	10,023	9,685
- Inactive members	5,495	5,532
- Total	27,345	27,166
• Covered payroll (annualized)	$ 584,025	$ 568,992
Calculated Contribution rates		
• Employer	31.81%	27.38%
Assets		
• Market value	$ 2,456,544	$ 2,464,439
• Actuarial value	2,582,510	2,490,521
• Estimation of return on market value	2.8%	16.0%
• Estimation of return on actuarial value	6.8%	7.9%
• Employer contribution	$ 145,007	$ 128,274
• Member contribution	$ 16,198	$ 16,580
• Ratio of actuarial value to market value	105.1%	101.1%
• External cash flow as % of market value assets	-3.4%	-3.4%
Actuarial Information		
• Employer normal cost %	6.92%	5.85%
• Unfunded actuarial accrued liability (UAAL)	$ 2,183,209	$ 1,798,058
• Amortization rate	23.70%	21.53%
• Funding period	30.0 years	30.0 years
• GASB funded ratio	54.2%	58.1%

Note: Dollar amounts in $000, unless otherwise noted

Contribution Requirements

- The Executive Summary shows the new, calculated contribution rate
- Rates shown on the Executive Summary are calculated rates for the twelve-month period beginning one year after the valuation date, based on current board policy
- Table 6 reconciles the calculated contribution rate from the prior valuation to the current valuation
- No changes to the benefit provisions were reflected in this valuation
- There were material changes to the actuarial assumptions reflected in this valuation, including a decrease in the investment return assumption from 8.50% to 8.00%
- Amortization payment is based on
  - 30-year open funding period beginning July 1, 2015
  - Contributions are determined as a level percentage of pay, with expected increases in the projected payroll (and contribution dollar amounts) of 3.00% per year
  - No future growth in the number of active members is taken into account
- The Plan's funded ratio decreased from the prior year because of the new assumptions
- The Plan's calculated contribution rate increased from the prior year primarily due to the change of the actuarial assumptions and the investment performance during the prior year
- The table below shows the estimated City contributions under the ARM&CA for the current fiscal year and the following fiscal year assuming that the actual fiscal year payroll will increase by the payroll growth rate assumption (3%) each year

Projected employer contribution based on ARM&CA		
Fiscal year ending June 30,	2017	2016
1. Projected payroll	$ 608,393,840	$ 590,673,631
2. ARM&CA Contribution Rate	29.36%	27.36%
3. Projected employer contribution (1 x 2)*	$ 178,624,432	$ 161,608,306

*Employer contribution is at least equal to the prior year dollar contribution plus $10 million.

Note: For fiscal year 2015 actual payroll was $577.4 million. The Meet and Confer contribution rate was 25.36% and the actual employer contribution to the System was $146.4 million (including the 415 Restoration Plan).

Calculation of Contribution Rates

The funds available to pay benefits come from two sources, contributions and investment income on those contributions (the majority of the funds available to pay benefits come from investment income). HMEPS receives contributions from two sources, employer contributions which are determined as a percent of pay (unless otherwise specified under the ARM&CA), and by some member contributions. As shown in Table 2, the actuarially determined employer contribution rate has two components:

- The normal cost percentage (NC%)
- The amortization percentage (UAAL%)

The NC% is the theoretical amount which would be required to pay the members' benefits, based on the plan provisions for new employees, if this amount had been contributed from each member's entry date and if the fund's experience exactly followed the actuarial assumptions. This is the amount it should cost to provide the benefits for an average new member. The NC% is shown in Table 4.

The actuarial accrued liability (AAL) is the difference between (i) the actuarial present value of all future benefits for all current participants of the fund, including active, inactive and retired members, and (ii) the actuarial present value of future normal costs. Thus the AAL represents the liability associated with past years. The unfunded actuarial accrued liability (UAAL) is the difference between the AAL and the actuarial value of assets (AVA). It is the shortfall/excess between the liability associated with prior years (the AAL) and the assets actually accumulated (the AVA). This shortfall/excess can arise from several sources, including actuarial gains and losses which are caused by differences between actual experience and the plan's assumptions, changes to the plan's actuarial assumptions, and amendments to the benefit provisions.

The UAAL% is the amount required to fund this difference. It is the amount, expressed as a level percentage of payroll, necessary to amortize the UAAL. The ARM&CA has specified that this amortization should be over an open 30-year period beginning July 1, 2015, then over a closed 30-year period once the City begins paying the actuarially determined employer contribution rate. Item 11a of Table 2 shows the UAAL%.

The calculated rate is used in determining the contributions necessary to meet the funding policy for the twelve-month period beginning July 1, 2016. Based on projected payroll, the FY 2017 actuarially determined employer contribution is estimated to be 31.81% of payroll. The actuarially determined contribution rate produces an estimated contribution of approximately $193.5 million, which compares with the anticipated contribution under the ARM&CA for FY 2017 of $178.6 million.

Financial Data and Experience

As of July 1, 2015, HMEPS has a total market value of about $2.46 billion. Financial information was gathered from the 2015 HMEPS Comprehensive Annual Financial Report.

This report includes a number of exhibits related to plan assets. Table 8 shows how the total market value is distributed among the various classes of investments. Current investment policy allocates 52.5% of invested assets to equities, 15% of invested assets to fixed income, and 32.5% of invested assets to alternative investments and real estate.

Table 9 shows a reconciliation of the market values between the beginning and end of FY2015.

As shown on Table 11, the dollar-weighted return net of all expenses for FY2015 was 2.78%.

In determining the contribution rates and funded status of the System, an actuarial value of assets (AVA) is used, rather than the market value of assets. This "smoothing method" is intended to help reduce the volatility of the contribution rates from year to year. The method used to compute the AVA takes the difference between the actual market value of assets and the expected actuarial value of assets (based on the previously assumed 8.5% investment return rate), and establishes a base each year which is equal to this difference less any unrecognized bases from prior years. If the current year's base is of opposite sign from the prior years' bases then it is offset dollar for dollar against the prior years' bases (oldest bases first) until either the prior years' bases or the current year's base is reduced to zero. Any remaining bases are then recognized over the remaining period for the base (5 less the number of years between the base year and the valuation year) in equal dollar amounts.

The development of the AVA is shown on Table 10. The AVA is $2.58 billion. The AVA is 105.1% of the MVA, compared to 101.1 % last year.

In addition to the market return, Table 11 also shows the return on the actuarial value of assets for HMEPS. For FY2015, this return was 6.82%. Because this is less than the previously assumed 8.5% investment return, an actuarial loss occurred increasing the unfunded actuarial accrued liabilities of the plan. Table 12 shows a summary of market and actuarial return rates in recent years.

Member Data

Member data as of July 1, 2015 was supplied electronically by HMEPS staff. While we did not audit this data, we did perform various tests to ensure that it was internally consistent, consistent with the prior year's data, and was reasonable overall.

Tables 16 and 17 show the summaries of certain historical data, including membership statistics. Table 18 shows the number of members by category (active, inactive, retired, etc.). Tables 19(a-d) show the active member statistics by Group and in total.

The number of active members decreased from 11,949 to 11,827, a 1.0 % decrease.

The total annualized salaries shown on Table 2 and on the statistical tables is the amount that was supplied by HMEPS, annualized or adjusted for number of hours reported if necessary. For the cost calculations, the pays were adjusted in accordance with the actuarial assumptions to reflect one year's salary increase. The annualized salaries for active members increased 2.6% over last year, compared with an increase of 3.5% the prior year.

We also show the projected payroll in Item 2 of Table 2. This is the payroll used for determining the expected amortization payments (amortization percentage) towards the unfunded actuarial accrued liability. The projected pay is determined by summing all pensionable pay for the just ended fiscal year for anyone who received pensionable pay during the year (actives, terminated members, retirees, etc.) and increasing this sum by the payroll growth rate. The number is then adjusted by the ratio of the number of active members on the valuation date to the average of the number of active members at the current and prior year's valuation dates. We believe this provides a better expectation of the upcoming year's actual payroll than the annualized salaries described above.

The overall trend in payroll is significant because the methodology used in the valuation to amortize the unfunded liability assumes a growing payroll into the future. If the payroll does not grow at the assumed 3% a year on average, the amortization payments (as a percentage of pay) will need to increase in order to keep the contribution dollars that amortize the UAAL growing at 3%.

Benefit Provisions

Appendix B of our Report includes a summary of the benefit provisions for HMEPS. The following is a summary of the benefit provisions for members hired after January 1, 2008 (Group D).

- *Normal Retirement Eligibility*
    - Age 62 with 5 years of service
- *Normal Retirement Benefit*
    - 1.80% of FAS for each of the first 25 years of Credited Service, and 1.00% of FAS for each year of Credited Service over 25. Maximum benefit is 90% of FAS for all future retirees.
- *Normal Form of Payment*
    - Life only to the retiree. Group D members may elect other options based on actuarial factors.
- *Employee Contributions* are not required
- *Post-retirement Cost of Living Adjustments (COLA)*
    - None.

The ARM&CA added an additional optional form of payment for retiring unmarried Group A and Group B members. These members may select an actuarially equivalent optional form of payment with a designated beneficiary (this option was already available for members of Group D). Because these optional forms are actuarially equivalent forms of payment this new benefit provision is not expected to have any impact on the financial condition of the System.

This valuation reflects all benefits offered to members. There are no ancillary benefits that might be deemed a liability if continued beyond the availability of funding by the current funding source.

There were no changes in the benefit provisions since the prior valuation.

Actuarial Methods and Assumptions

Appendix A includes a summary of the actuarial assumptions and methods used in this valuation. Costs are determined using the Entry Age Normal actuarial cost method. The assumed investment return rate is 8.00%. The Board adopted the actuarial assumptions used in this valuation in connection with an actuarial experience study performed by GRS. Please see our report dated February 25, 2016 for a complete description of the changes in assumptions and for the rationale behind the current assumption set. These assumptions were used beginning with the July 1, 2015 valuation. It is anticipated that the next experience study will be conducted during the spring of 2020.

Please see Appendix A of our Report for a complete description of these assumptions.

Funding Progress

As you are aware, the Governmental Accounting Standards Board Statements (GASB) that apply to the System have changed. In prior years, GASB Statement No. 25 applied to the System. Beginning with the 2014 fiscal year GASB Statement No. 67 applies to the System. The GASB No. 67 disclosure information has been provided in a separate report.

Although GASB No. 25 no longer applies to HMEPS, there are certain schedules from GASB No. 25 which we believe provide useful information and therefore we are continuing to include these in our report. In particular, we are continuing to show the Schedule of Funding Progress (Table 14) and the Schedule of Employer Contributions (Table 15).

Summary and Closing Comments

While much of the experience related changes were mostly positive since the previous valuation, the new assumptions adopted by the Board increased the projected liabilities and thus the contribution requirements going forward.

The System's funded status decreased from 58.1% to 54.2% and the actuarially determined contribution rate increase proportionately from 27.38% to 31.81%.

Given the plan's contribution policy, if all actuarial assumptions are met (including the assumption of the plan earning 8.00% on the actuarial valuation of assets), it is expected that:

a. The employer contribution rate will increase by 2.00% per year until the actuarially determined contribution is achieved, which is now projected to be Fiscal Year 2019,

b. The employer normal cost as a percentage of pay will remain level over time,

c. Once the actuarially determined contributions are being met, the amortization period will then close and begin to decrease annually.

d. The funding ratio will increase slowly,

e. The UAAL will grow in nominal dollars until the amortization period is reduced to approximately 20 years, at which point it will begin to decrease and be expected to be fully amortized by the July 1, 2047 valuation, or 32 years after the July 1, 2015 valuation date.

Summary of Cost Items

	Valuation as of July 1, 2015		Valuation as of July 1, 2014	
	Cost Item	Cost as % of Pay	Cost Item	Cost as % of Pay
	(1)	(2)	(3)	(4)
1. Participants				
a. Actives	11,827		11,949	
b. Retirees	7,819		7,498	
c. Disabled retirees	350		371	
d. Beneficiaries	1,854		1,816	
e. Inactive, deferred vested	3,202		3,313	
f. Inactive, nonvested	2,293		2,219	
g. Total	27,345		27,166	
2. Covered payroll	$ 584,025		$ 568,992	
3. Averages for active members				
a. Average age	47.1		46.9	
b. Average years of service	11.2		11.1	
c. Average pay ($)	$ 49,381		$ 47,618	
4. Present value of future pay	$ 4,141,116		$ 3,816,664	
5. Total normal cost rate	6.92%		5.85%	
6. Present value of future benefits	$ 5,147,907	881.5%	$ 4,608,473	809.9%
7. Present value of future normal costs	$ 382,188	65.4%	$ 319,894	56.2%
8. Actuarial accrued liability (6 - 7)	$ 4,765,719	816.0%	$ 4,288,579	753.7%
9. Present actuarial assets	$ 2,582,510	442.2%	$ 2,490,521	437.7%
10. Unfunded actuarial accrued liability (UAAL) (8 - 9)	$ 2,183,209	373.8%	$ 1,798,058	316.0%
11. Funding period	30 years		30 years	
12. Calculated employer contribution rate				
a. Normal cost	6.92%		5.85%	
b. Amortization charge	23.70%			
c. Admin Expenses	1.19%		21.53%	
d. Total	31.81%		27.38%	
13. Average estimated return				
a. Based on market value	2.78%		16.04%	
b. Based on actuarial value	6.82%		7.95%	
14. Funded ratio (9 ÷ 8)	54.2%		58.1%	

Calculation of Annual Required Contribution Rate

		July 1, 2015 (1)	July 1, 2014 (2)
1.	Annualized salaries on valuation date	$ 584,025	$ 568,992
2.	Projected payroll for upcoming fiscal year*	$ 590,674	$ 561,423
3.	Present value of future pay	$ 4,141,116	$ 3,816,664
4.	Employer normal cost rate	6.92%	5.85%
5.	Actuarial accrued liability for active members		
	a. Present value of future benefits for active members	$ 2,315,047	$ 2,070,248
	b. Less: present value of future employer normal costs	(270,476)	(210,384)
	c. Less: present value of future employee contributions	(111,712)	(109,510)
	d. Actuarial accrued liability	$ 1,932,859	$ 1,750,354
6.	Total actuarial accrued liability for:		
	a. Retirees and beneficiaries	$ 2,638,305	$ 2,360,600
	b. Inactive participants	$ 194,555	177,625
	c. Active members (Item 5d)	$ 1,932,859	1,750,354
	d. Total	$ 4,765,719	$ 4,288,579
7.	Actuarial value of assets	$ 2,582,510	$ 2,490,521
8.	Unfunded actuarial accrued liability (UAAL) (Item 6d - Item 7)	$ 2,183,209	$ 1,798,058
9.	Funding period	30 years	30 years
10.	Assumed payroll growth rate	3.00%	3.00%
11.	Employer Contribution requirement		
	a. UAAL amortization payment as % of projected pay	23.70%	21.53%
	b. Employer normal cost	6.92%	5.85%
	c. Admin Expenses	1.19%	N/A
	d. Contribution requirement (a + b + c)	31.81%	27.38%

Note: Dollar amounts in $000

* The projected payroll is the actual pay received for the just completed fiscal year (including pay for any member who received pay during the year: i.e. active, terminated, retired, etc.). This pay is then increased by the payroll growth rate and by the ratio of the current number of active members to the average number of active members during the prior fiscal year.

Actuarial Present Value of Future Benefits

			July 1, 2015 (1)	July 1, 2014 (2)
1.	Active members			
	a.	Retirement benefits	$ 2,093,301	$ 1,860,972
	b.	Deferred termination benefits	121,170	107,147
	c.	Refunds	11,227	13,818
	d.	Death benefits	77,388	76,719
	e.	Disability benefits	11,961	11,592
	f.	Total	$ 2,315,047	$ 2,070,248
2.	Members in Pay Status			
	a.	Service retirements	$ 2,354,163	$ 2,100,640
	b.	Disability retirements	40,160	37,881
	c.	Beneficiaries	243,982	222,079
	d.	Total	$ 2,638,305	$ 2,360,600
4.	Inactive members			
	a.	Vested terminations	$ 188,994	$ 173,825
	b.	Nonvested terminations	5,561	3,800
	c.	Total	$ 194,555	$ 177,625
5.	Total actuarial present value of future benefits		$ 5,147,907	$ 4,608,473

Note: Dollar amounts in $000

Analysis of Normal Cost

		July 1, 2015	July 1, 2014
		(1)	(2)
1.	Gross normal cost rate		
a.	Retirement benefits	5.59%	4.67%
b.	Deferred termination benefits	0.88%	0.72%
c.	Refunds*	0.00%	0.00%
d.	Disability benefits	0.08%	0.07%
e.	Death benefits	0.37%	0.39%
f.	Total	6.92%	5.85%

*Refund of employee contributions excluded due to use of replacement life normal cost method for ongoing plan. New members (Group D) do not contribute to the plan.

Calculation of Total Actuarial Gain or Loss

1.	Unfunded actuarial accrued liability (UAAL) as of July 1, 2014	$	1,798,058
2.	Employer normal cost for year*		33,779
3.	Employer Contributions during year ending June 30, 2015*		(145,007)
4.	Interest on UAAL for one year		152,835
5.	Interest on Item 2 and Item 3 for one-half year		(4,631)
6.	Expected UAAL as of July 1, 2015 (1+2+3+4+5)	$	1,835,034
7.	Actual UAAL as of July 1, 2015	$	2,183,209
8.	Actuarial gain/(loss) for the period (6 - 7)	$	(348,175)
	SOURCE OF GAINS/(LOSSES)		
9.	Asset gain/(loss) (See Table 10)	$	(41,272)
10.	Assumption changes	$	(319,957)
11.	Changes from Meet & Confer		0
12.	Total liability gain/(loss) for the period	$	13,054
13.	Actuarial gain/(loss) for the period	$	(348,175)

Note: Dollar amounts in $000

*Employee contributions excluded due to use of replacement life normal cost method for ongoing plan. New members (Group D) do not contribute to the plan.

Change in Calculated Contribution Rate Since the Prior Valuation

1.	Calculated Contribution Rate as of July 1, 2014			27.38%
2.	Change in Contribution Rate During Year			
	a.	Change in Employer Normal Cost	0.05%	
	b.	Recognition of prior years' asset losses	0.16%	
	c.	Actuarial loss from current year asset performance	0.33%	
	d.	Actuarial gain from liability sources	(0.20%)	
	e.	Impact of City contributing less than actuarially determined rate	0.29%	
	f.	Effect of projected payroll growing faster than expected	(0.51%)	
	g.	Effect of resetting amortization period to 30 years	(0.40%)	
	h.	Change in Actuarial Assumptions	4.71%	
	i.	Total Change		4.43%
3.	Calculated Contribution Rate as of July 1, 2015			31.81%

Near Term Outlook

Valuation as of July 1,	Unfunded Actuarial Accrued Liability (UAAL, in 000s)	Funded Ratio	Calculated Contribution Rate	Funding Period (Years)[1]	Market Value of Fund (in 000s)	For Fiscal Year Ending June 30,	Projected Compensation	Employer Contributions	Employee Contributions	Benefit Payments[2]	Net External Cash Flow
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2015	$ 2,183,209	54.2%	31.81%	30.0	$ 2,456,544	2016	$ 590,674	$ 161,608	$ 16,330	$ 273,769	$ (95,831)
2016	2,278,359	53.7%	32.06%	30.0	2,553,477	2017	608,394	178,624	15,421	294,355	(100,310)
2017	2,354,413	53.6%	31.94%	30.0	2,653,510	2018	629,411	197,383	14,565	315,824	(103,876)
2018	2,420,828	53.6%	32.25%	29.0	2,757,840	2019	649,601	207,483	13,728	338,205	(116,993)
2019	2,485,449	53.6%	32.55%	28.0	2,856,884	2020	670,320	216,147	12,906	361,171	(132,118)
2020	2,521,010	54.0%	32.57%	27.0	2,948,133	2021	691,867	225,231	12,091	384,547	(147,224)
2021	2,550,999	54.3%	32.59%	26.0	3,030,984	2022	714,050	232,580	11,277	408,386	(164,529)
2022	2,577,355	54.6%	32.60%	25.0	3,102,479	2023	736,836	240,147	10,471	432,493	(181,875)
2023	2,599,996	54.9%	32.59%	24.0	3,161,667	2024	760,260	247,829	9,683	422,820	(165,308)
2024	2,619,226	55.3%	32.61%	23.0	3,242,807	2025	784,499	255,707	8,908	440,325	(175,710)
2025	2,634,018	55.8%	32.61%	22.0	3,319,628	2026	809,249	263,862	8,156	455,136	(183,118)

These projections are based on the Amended and Restated Meet and Confer agreement assuming that the benefit provisions that went into effect January 1, 2008 remain in effect throughout the projection. Beginning in FY2012, the employer contributions shown above are based on a negotiated amount of $98.5 million in FY2012 followed by increases in the following fiscal years equal to the greater of the prior year's dollar contribution increased by $10 million or the set contribution rate of 19.36% increased by 2% per year over the previous year's contribution rate. This method of determining the contribution rate remains in place until the contribution rate reaches the actuarially determined contribution rate determined by the valuation of the year prior (i.e. the FY 2016 rate is set by the July 1, 2014 valuation). Any changes to future accruals or failure to contribute the calculated rate will change the results of this projection.

[1] The agreement between the City and HMEPS includes an open 30 year amortization period until the actual City contribution rate reaches the actuarially determined contribution rate.
[2] Includes refunds taken by terminating members and plan administrative expenses

Note: Dollar amounts in $000.

Statement of Plan Net Assets

	July 1, 2015 (1)	July 1, 2014 (2)
A. ASSETS		
1. Current Assets		
a. Cash and short term investments		
1) Cash on hand	$ 622	$ 401
2) Short term investments	78,699	48,569
b. Accounts Receivable		
1) Sale of investments	19,724	12,065
2) Other	5,156	6,808
c. Total Current Assets	$ 104,201	$ 67,843
2. Long Term Investments		
a. US. Government securities	$ 85,623	$ 83,700
b. Corporate bonds	225,280	223,849
c. Capital stocks	768,811	866,082
d. Commingled Funds	393,973	382,672
e. LP's, real estate trusts, loans and mortgages	914,954	859,757
f. Total long term investments	$ 2,388,641	$ 2,416,060
3. Other Assets		
a Collateral on securities lending	$ 101,533	$ 139,504
b. Furniture, fixtures and equipment, net	395	444
c. Total other assets	$ 101,928	$ 139,948
4. Total Assets	$ 2,594,770	$ 2,623,851
B. LIABILITIES		
1. Current Liabilities		
a. Amounts due on asset purchases	$ 30,782	$ 14,525
b. Accrued liabilities	5,911	5,383
c. Collateral on securities lending	101,533	139,504
2. Total Liabilities	138,226	159,412
3. Net Assets Held in Trust	$ 2,456,544	$ 2,464,439
C. TARGET ASSET ALLOCATION FOR CASH & LONG TERM INVESTMENTS		
1. Cash	0.0%	0.0%
2. Fixed Income	15.0%	15.0%
3. Real Estate	10.0%	10.0%
4. Private Equities	17.5%	17.5%
5. Global Equities	35.0%	35.0%
6. Alternative Investments	22.5%	22.5%
7. Total	100.0%	100.0%

Note: Dollar amounts in $000
Columns may not add due to rounding

Reconciliation of Plan Net Assets

			Year Ending June 30, 2015 (1)	Year Ending June 30, 2014 (2)
1.	Market value of assets at beginning of year		$ 2,464,439	$ 2,196,615
2.	Revenue for the year			
	a.	Contributions		
		i. Member contributions	$ 16,198	$ 16,580
		ii. Employer contributions (see note)	145,007	128,274
		iii. Total	$ 161,205	$ 144,854
	b.	Net investment income		
		i. Interest	$ 17,417	$ 24,080
		ii. Dividends	19,323	19,523
		iii. Earnings from LP's and real estate trusts	8,679	4,996
		iv. Net appreciation (depreciation) on investments	36,335	311,189
		v. Net proceeds from lending securities	484	590
		vi. Less investment expenses	(8,384)	(8,585)
		vii. Other	557	730
	c.	Total revenue	$ 235,616	$ 497,377
3.	Expenditures for the year			
	a.	Refunds	$ 1,549	$ 1,213
	b.	Benefit payments	234,955	221,925
	c.	Administrative and miscellaneous expenses	7,007	6,415
	d.	Total expenditures	$ 243,511	$ 229,553
4.	Increase in net assets (Item 2c - Item 3d)		$ (7,895)	$ 267,824
5.	Market value of assets at end of year (Item 1 + Item 4)		$ 2,456,544	$ 2,464,439

Note: Dollar amounts in $000

Employer contribution does not include amounts contributed to the replacement benefit plan.

Columns may not add due to rounding

Development of Actuarial Value of Assets

		July 1, 2015
1. Actuarial value of assets at beginning of year	$	2,490,521
2. Net new investments		
a. Contributions	$	161,205
b. Benefits and refunds paid		(236,504)
c. Subtotal		(75,299)
3. Assumed investment return rate for fiscal year		8.50%
4. Assumed investment income for fiscal year	$	208,560
5. Expected Actuarial Value at end of year (1+ 2 + 4)	$	2,623,782
6. Market value of assets at end of year	$	2,456,544
7. Difference (6 - 5)	$	(167,238)

8. Development of amounts to be recognized as of July 1, 2015:

Fiscal Year End	Remaining Deferrals of Excess (Shortfall) of Investment Income	Offsetting of Gains/(Losses)	Net Deferrals Remaining	Years Remaining	Recognized for this valuation	Remaining after this valuation
	(1)	(2)	(3) = (1) + (2)	(4)	(5) = (3) / (4)	(6) = (3) - (5)
2011	$ 0	$ 0	$ 0	1	$ 0	$ 0
2012	(26,082)	0	(26,082)	2	(13,041)	(13,041)
2013	0	0	0	3	0	0
2014	0	0	0	4	0	0
2015	(141,156)	0	(141,156)	5	(28,231)	(112,925)
Total	$ (167,238)	$ 0	$ (167,238)		$ (41,272)	$ (125,966)

9. Final actuarial value of plan net assets, end of year (Item 6 - Item 8 Column 6)	$	2,582,510
10. Asset gain (loss) for year (Item 9 - Item 5)	$	(41,272)
11. Asset gain (loss) as % of actual actuarial assets		(1.60%)
12. Ratio of actuarial value to market value		105.1%

Notes: Remaining deferrals in Column (1) for prior years are from last year's report column (6) of Table 10. The number in the current year is the difference between the remaining deferrals for prior years and the total Excess/(Shortfall) return shown in Item 7. Column 2 is a direct offset of the current year's excess/(shortfall) return against prior years' excess/(shortfall) of the opposite type.

Estimation of Investment Return Yield (Net of Expenses)

Item	July 1, 2015	July 1, 2013
(1)	(2)	(3)
A. Market value yield		
1. Beginning of year net market assets	$ 2,464,439	$ 2,196,615
2. Net Investment income (net of all expenses)*	67,404	346,108
3. End of year market assets	2,456,544	2,464,439
4. Estimated market value yield	2.78%	16.04%
B. Actuarial value yield		
1. Beginning of year actuarial assets	$ 2,490,521	$ 2,382,585
2. Net Investment income (net of all expenses)*	167,288	186,220
3. End of year actuarial assets	2,582,510	2,490,521
4. Estimated actuarial value yield	6.82%	7.95%

*Net investment income is net of both investment and administrative expenses

Note: Dollar amounts in $000

History of Investment Returns

For Fiscal Year Ending	Market Value	Actuarial Value
(1)	(2)	(3)
June 30, 2003	2.34%	1.69%
June 30, 2004	18.10%	4.16%
June 30, 2005	12.85%	4.12%
June 30, 2006	16.41%	8.95%
June 30, 2007	17.85%	21.51%
June 30, 2008	(0.25%)	8.97%
June 30, 2009	(20.14%)	2.60%
June 30, 2010	11.21%	3.54%
June 30, 2011	21.56%	6.27%
June 30, 2012	(0.89%)	4.46%
June 30, 2013	13.02%	5.39%
June 30, 2014	16.04%	7.95%
June 30, 2015	2.78%	6.82%
Average Compound Return - last 5 years	10.18%	6.17%
Average Compound Return - last 10 years	7.04%	7.53%

Note: Investment returns are estimations made by the actuary and are dollar-weighted returns net of administrative and investment expenses.

Historical Solvency Test

	Aggregated Accrued Liabilities for				Portions of Accrued Liabilities Covered by Reported Assets		
Valuation Date	Active Members Contributions	Retirees Beneficiaries and Vested Terminations[1]	Members (City Financed Portion)	Actuarial Value of Assets	(5)/(2)	[(5)-(2)]/(3)	[(5)-(2)-(3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
July 1, 1996	$ 45,819	$ 438,486	$ 558,154	$ 857,332	100.0%	100.0%	67%
July 1, 1998	34,781	502,335	703,025	1,095,617	100.0%	100.0%	79%
July 1, 1999	33,985	599,270	706,678	1,222,240	100.0%	100.0%	83%
July 1, 2000	38,292	646,611	824,470	1,376,020	100.0%	100.0%	84%
July 1, 2001	36,449	804,901	1,114,456	1,490,179	100.0%	100.0%	58%
July 1, 2002	35,888	893,568	1,585,733	1,519,717	100.0%	100.0%	37%
July 1, 2003	44,388	1,115,801	2,118,063	1,510,264	100.0%	100.0%	17%
July 1, 2004	62,062	1,355,157	1,216,599	1,501,235	100.0%	100.0%	7%
July 1, 2005	48,150	1,577,345	1,099,777	1,777,656	100.0%	100.0%	14%
July 1, 2006	58,043	1,729,863	1,106,389	1,867,293	100.0%	100.0%	7%
July 1, 2007	69,544	1,824,992	1,234,178	2,193,745	100.0%	100.0%	24%
July 1, 2008	81,182	1,904,333	1,310,855	2,310,384	100.0%	100.0%	25%
July 1, 2009	95,268	1,974,714	1,381,428	2,284,442	100.0%	100.0%	16%
July 1, 2010	107,421	2,058,813	1,466,236	2,273,142	100.0%	100.0%	7%
July 1, 2011	118,202	2,154,959	1,517,167	2,328,804	100.0%	100.0%	4%
July 1, 2012	124,848	2,312,548	1,529,468	2,344,128	100.0%	96.0%	0%
July 1, 2013	132,238	2,431,950	1,565,395	2,382,585	100.0%	92.5%	0%
July 1, 2014	139,203	2,538,225	1,611,151	2,490,521	100.0%	92.6%	0%
July 1, 2015	143,097	2,832,860	1,789,762	2,582,510	100.0%	86.1%	0%

Note: Dollar amounts in $000

[1] Column (3) included AAL for DROP participants until 2003, now in Column (4)

Schedule of Funding Progress

Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annualized Salaries	UAAL as % of Salaries (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
July 1, 1996	$ 857,332	$ 1,042,459	$ 185,127	82.2%	$ 367,610	50.4%
July 1, 1998	1,095,617	1,240,141	144,524	88.3%	397,698	36.3%
July 1, 1999	1,222,240	1,339,933	117,693	91.2%	407,733	28.9%
July 1, 2000	1,376,020	1,509,373	133,353	91.2%	432,604	30.8%
July 1, 2001	1,490,179	1,955,806	465,627	76.2%	418,234	111.3%
July 1, 2002	1,519,717	2,515,189	995,472	60.4%	399,794	249.0%
July 1, 2003	1,510,264	3,278,251	1,767,987	46.1%	390,314	453.0%
July 1, 2004	1,501,235	2,633,817	1,132,582	57.0%	366,190	309.3%
July 1, 2005	1,777,656	2,725,272	947,616	65.2%	404,565	234.2%
July 1, 2006	1,867,293	2,894,295	1,027,002	64.5%	422,496	243.1%
July 1, 2007	2,193,745	3,128,713	934,968	70.1%	448,925	208.3%
July 1, 2008	2,310,384	3,296,370	985,986	70.1%	483,815	203.8%
July 1, 2009	2,284,442	3,451,410	1,166,968	66.2%	539,023	216.5%
July 1, 2010	2,273,142	3,632,470	1,359,328	62.6%	550,709	246.8%
July 1, 2011	2,328,804	3,790,328	1,461,524	61.4%	544,665	268.3%
July 1, 2012	2,344,128	3,966,864	1,622,736	59.1%	534,394	303.7%
July 1, 2013	2,382,585	4,129,583	1,746,998	57.7%	549,971	317.7%
July 1, 2014	2,490,521	4,288,579	1,798,058	58.1%	568,992	316.0%
July 1, 2015	2,582,510	4,765,719	2,183,209	54.2%	584,025	373.8%

Note: Dollar amounts in $000

Historical City Contribution Rates

Valuation Date	Calculated Contribution Rate[1]	Time Period for Contribution Rate	Actual Contribution Rate
(1)	(2)	(3)	(4)
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	9.30	July 1, 1994 through June 30, 1995	9.30
July 1, 1994	8.80	July 1, 1995 through June 30, 1996	8.80
July 1, 1995	9.20	July 1, 1996 through June 30, 1997	9.20
July 1, 1996	9.10	July 1, 1997 through June 30, 1998	9.10
		July 1, 1998 through June 30, 1999	9.10
July 1, 1998	9.30	July 1, 1999 through June 30, 2000	9.30
July 1, 1999	9.80	July 1, 2000 through June 30, 2001	10.00
July 1, 2000	9.50	July 1, 2001 through June 30, 2002	10.00
July 1, 2001	17.70	July 1, 2002 through June 30, 2003	10.00
July 1, 2002	31.80	July 1, 2003 through June 30, 2004	14.70
July 1, 2003	52.89	July 1, 2004 through June 30, 2005	92.55[2,3]
July 1, 2004	29.43	July 1, 2005 through June 30, 2006	15.49[3]
July 1, 2005	24.10	July 1, 2006 through June 30, 2007	15.89[3]
July 1, 2006	24.63	July 1, 2007 through June 30, 2008	15.52[4]
July 1, 2007	19.47	July 1, 2008 through June 30, 2009	14.63[4]
July 1, 2008	19.20	July 1, 2009 through June 30, 2010	14.65[4]
July 1, 2009	20.07	July 1, 2010 through June 30, 2011	16.30[4]
July 1, 2010	22.36	July 1, 2011 through June 30, 2012	17.74[5]
July 1, 2011	23.45	July 1, 2012 through June 30, 2013	21.10[5]
July 1, 2012	26.10	July 1, 2013 through June 30, 2014	23.70[5]
July 1, 2013	27.50	July 1, 2014 through June 30, 2015	25.11[5]
July 1, 2014	27.38	July 1, 2015 through June 30, 2016	N/A
July 1, 2015	31.81	July 1, 2016 through June 30, 2017	N/A

[1] Rate determined by the actuarial valuation is for the fiscal year beginning on the July 1st next following the valuation date.

[2] Includes $300 million note.

[3] As pursuant to the funding schedule from the 2004 Meet and Confer Agreement.

[4] As pursuant to the funding schedule from the Fourth Amendment.

[5] As pursuant to the funding schedule from the ARM&CA.

Historical Active Participant Data

Valuation Date	Active Count	Average Age	Average Svc	Annualized Salaries	Average Salary	Percent Changes
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1989	11,356	N/A	N/A	$235,400	$20,729	3.2%
1990	12,037	40.0	N/A	$258,556	$21,480	3.6%
1991	12,488	40.3	N/A	$284,914	$22,815	6.2%
1992	12,913	40.5	N/A	$314,686	$24,370	6.8%
1993	13,112	40.9	N/A	$340,249	$25,949	6.5%
1994	14,027	40.9	N/A	$366,561	$26,133	0.7%
1995	14,364	41.3	N/A	$378,511	$26,351	0.8%
1996	14,067	41.8	N/A	$367,610	$26,133	(0.8%)
1998 [1]	13,764	42.8	9.8	$394,919	$28,692	9.8%
1999 [1]	13,286	42.9	9.8	$396,617	$29,852	4.0%
2000 [1]	13,126	43.7	10.3	$421,591	$32,119	7.6%
2001 [1]	12,928	43.9	10.3	$413,021	$31,948	(0.5%)
2002	12,527	44.7	11	$399,794	$31,915	(0.1%)
2003	12,120	45.2	11.2	$390,314	$32,204	0.9%
2004	11,856	45.1	10.3	$366,190	$30,886	(4.1%)
2005 [2]	11,974	44.8	9.6	$404,565	$33,787	9.4%
2006	12,145	44.8	9.3	$422,496	$34,788	3.0%
2007	12,376	45.2	9.3	$448,925	$36,274	4.3%
2008	12,653	45.2	9.3	$483,815	$38,237	5.4%
2009	13,333	45.1	9.2	$539,023	$40,428	5.7%
2010	12,913	45.8	10.0	$550,709	$42,648	5.5%
2011	12,345	46.5	10.6	$544,665	$44,120	3.5%
2012	11,670	46.8	11.1	$534,394	$45,792	3.8%
2013	11,781	46.9	11.1	$549,971	$46,683	1.9%
2014	11,949	46.9	11.1	$568,992	$47,618	2.0%
2015	11,827	47.1	11.2	$584,025	$49,381	3.7%

Note: Dollar amounts in $000

[1] Excludes DROP participants

[2] Beginning with the 2005 valuation, a change in methodology now annualizes payroll for new entrants. If the methodology had not been changed, the covered payroll for 2005 would have been $376,208,345 and the average payroll would have been $31,419.

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

Valuation July 1,	Added to Rolls: Number	Added to Rolls: Annual Allowances	Removed from Rolls: Number	Removed from Rolls: Annual Allowances	Rolls-End of Year: Number	Rolls-End of Year: Annual Allowances	% Increase in Annual Allowances	Average Annual Allowances
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1996	416	$ 3,119	239	$ 1,438	4,618	$ 38,815	6.4%	$ 8,405
1998	693	5,840	441	3,212	4,870	43,394	11.8%	8,910
1999	432	2,131	303	1,515	4,999	46,732	7.7%	9,348
2000	360	3,412	255	1,380	5,104	49,970	6.9%	9,790
2001	652	8,937	299	1,030	5,457	57,877	15.8%	10,606
2002	777	15,061	306	2,476	5,928	72,256	24.8%	12,189
2003	598	11,497	311	1,873	6,215	84,519	17.0%	13,599
2004	942	25,189	279	2,624	6,878	107,084	26.7%	15,569
2005	861	18,054	216	1,926	7,523	123,212	15.1%	16,378
2006	654	14,722	397	2,246	7,780	135,688	10.1%	17,441
2007	440	10,280	249	3,007	7,971	142,961	5.4%	17,935
2008	464	11,052	280	3,420	8,155	150,592	5.3%	18,466
2009	474	11,430	289	3,667	8,340	158,356	5.2%	18,988
2010	476	12,040	290	3,938	8,526	166,458	5.1%	19,524
2011	502	13,202	311	4,451	8,717	175,210	5.3%	20,100
2012	654	16,299	293	3,993	9,078	187,515	7.0%	20,656
2013	695	15,566	346	5,051	9,427	198,030	5.6%	21,007
2014	619	15,370	361	5,717	9,685	207,683	4.9%	21,444
2015	771	17,334	433	5,534	10,023	219,484	5.7%	21,898

Membership Data

	July 1, 2015 (1)	July 1, 2014 (2)	July 1, 2013 (3)
1. Active members			
a. Number	11,827	11,949	11,781
b. Number vested	8,352	8,818	8,627
c. Annualized salaries	$ 584,025,000	$ 568,992,000	$ 549,971,000
d. Average salary	49,381	47,618	46,683
e. Average age	47.1	46.9	46.9
f. Average service	11.2	11.1	11.1
2. Inactive participants			
a. Vested	3,202	3,313	3,298
b. Total annual benefits (deferred)	$ 22,450,520	$ 23,048,675	$ 22,775,947
c. Average annual benefit	7,011	6,957	6,906
d. NonVested	2,293	2,219	2,257
3. Service retirees			
a. Number	7,819	7,498	7,258
b. Total annual benefits	$ 188,491,161	$ 178,109,613	$ 170,255,078
c. Average annual benefit	24,107	23,754	23,458
d. Average age	68.5	68.5	68.3
4. Disabled retirees			
a. Number	350	371	387
b. Total annual benefits	$ 3,643,233	$ 3,749,983	$ 3,803,033
c. Average annual benefit	10,409	10,108	9,827
d. Average age	64.8	64.8	64.3
5. Beneficiaries and spouses			
a. Number	1,854	1,816	1,782
b. Total annual benefits	$ 27,349,358	$ 25,823,664	$ 23,971,844
c. Average annual benefit	14,752	14,220	13,452
d. Average age	68.3	69.7	69.6

Distribution of Group A Active Members by Age and by Years of Service

Attained Age	0 No. & Avg. Comp.	1 No. & Avg. Comp.	2 No. & Avg. Comp.	3 No. & Avg. Comp.	4 No. & Avg. Comp.	5-9 No. & Avg. Comp.	10-14 No. & Avg. Comp.	15-19 No. & Avg. Comp.	20-24 No. & Avg. Comp.	25-29 No. & Avg. Comp.	30-34 No. & Avg. Comp.	35 & Over No. & Avg. Comp.	Total No. & Avg. Comp.
Under 25													
25-29	2	1	2		1	48	1						55
	$32,219	$55,806	$30,711		$32,136	$35,836	$44,262						$35,967
30-34	9	7	8	4	3	213	79	1					324
	$38,078	$48,470	$35,425	$41,033	$37,301	$44,352	$40,796	$74,984					$43,168
35-39	6	4	14	12	1	257	183	39	1				517
	$52,849	$49,608	$45,707	$40,817	$42,848	$48,818	$49,206	$48,261	$52,416				$48,692
40-44	6	9	12	6	1	231	228	102	35	1			631
	$36,937	$48,979	$51,551	$29,959	$52,395	$51,150	$50,413	$49,135	$52,560	$69,950			$50,308
45-49	5	8	6	6	4	237	273	145	135	48	2		869
	$46,405	$47,845	$41,506	$36,833	$37,825	$51,697	$51,138	$56,207	$57,150	$51,567	$44,949		$52,796
50-54	7	5	11	20	3	269	297	182	183	139	67	3	1,186
	$36,088	$48,115	$53,405	$47,313	$52,032	$49,501	$50,260	$52,570	$57,843	$54,747	$51,481	$62,240	$52,129
55-59	3	9	8	7	1	226	287	160	201	121	90	29	1,142
	$27,040	$32,906	$53,955	$67,068	$36,712	$51,775	$50,225	$54,147	$60,284	$61,336	$60,696	$63,508	$55,111
60-64	2	4	2	4		160	214	141	125	82	38	18	790
	$61,839	$55,001	$40,404	$44,751		$51,032	$49,983	$55,142	$57,751	$64,582	$65,136	$72,272	$55,102
65 & Over			1	1	1	86	131	64	57	27	16	13	397
			$68,952	$77,438	$80,517	$53,610	$54,485	$61,279	$61,280	$70,865	$66,655	$80,838	$58,993
Total	40	47	64	60	15	1,727	1,693	834	737	418	213	63	5,911
	$40,882	$46,252	$47,207	$45,448	$44,260	$49,551	$50,149	$54,013	$58,374	$59,296	$58,889	$69,528	$52,525

Average:	Age:	50.94	Number of participants:	Fully vested:	5,685	Males:	3,204
	Service:	14.78		Not Vested:	226	Females:	2,707

Note: A former Group A employee who is rehired on or after January 1, 2008 is still a Group A employee.
Note: The chart includes four employees who were formerly members of Group C. The chart also includes employees who switch from Group B to Group A.

Distribution of Group B Active Members by Age and by Years of Service

Attained Age	0 No. & Avg. Comp.	1 No. & Avg. Comp.	2 No. & Avg. Comp.	3 No. & Avg. Comp.	4 No. & Avg. Comp.	5-9 No. & Avg. Comp.	10-14 No. & Avg. Comp.	15-19 No. & Avg. Comp.	20-24 No. & Avg. Comp.	25-29 No. & Avg. Comp.	30-34 No. & Avg. Comp.	35 & Over No. & Avg. Comp.	Total No. & Avg. Comp.
Under 25													
25-29	1 $31,200		3 $24,149			8 $37,578							12 $33,689
30-34				1 $29,619		9 $32,785	1 $22,734						11 $31,584
35-39	2 $33,166		1 $102,232			3 $32,718		33 $47,026	1 $42,474				40 $46,526
40-44		6 $34,778	3 $28,669	2 $41,257	2 $36,296	9 $44,022	1 $105,643	88 $44,576	38 $47,104				149 $44,726
45-49	2 $53,373	1 $46,613	1 $34,154	3 $37,197	1 $29,245	9 $43,289		116 $42,946	124 $47,175	35 $50,203	3 $31,332		295 $45,425
50-54	5 $42,989	3 $47,043	7 $38,531	10 $66,562	2 $55,224	11 $43,020		88 $42,768	116 $47,486	88 $45,660	35 $47,934		365 $46,144
55-59	3 $62,740	2 $39,978	4 $68,297	2 $40,019	1 $42,224	13 $61,986		75 $47,224	122 $45,965	59 $51,787	32 $48,499	8 $51,204	321 $48,710
60-64	2 $40,269	1 $57,970	3 $55,314	4 $49,905		3 $84,725	1 $87,922	61 $45,943	73 $47,289	46 $55,963	15 $46,464	9 $62,659	218 $50,165
65 & Over		3 $40,567	1 $23,795		1 $32,635	2 $65,291		18 $47,072	33 $53,765	14 $54,203	4 $48,469	2 $50,419	78 $51,075
Total	15 $45,865	16 $41,002	23 $44,673	22 $53,136	7 $41,021	67 $46,917	3 $72,100	479 $44,700	507 $47,386	242 $50,263	89 $47,354	19 $56,548	1,489 $47,062

Average:	Age:	52.65	Number of participants:	Fully vested:	1,406	Males:	713
	Service:	20.54		Not Vested:	83	Females:	776

Note: A former Group B employee who is rehired on or after January 1, 2008 is still a Group B employee.

Distribution of Group D Active Members by Age and by Years of Service

Attained Age	0 No. & Avg. Comp.	1 No. & Avg. Comp.	2 No. & Avg. Comp.	3 No. & Avg. Comp.	4 No. & Avg. Comp.	5-9 No. & Avg. Comp.	10-14 No. & Avg. Comp.	15-19 No. & Avg. Comp.	20-24 No. & Avg. Comp.	25-29 No. & Avg. Comp.	30-34 No. & Avg. Comp.	35 & Over No. & Avg. Comp.	Total No. & Avg. Comp.
Under 25	107	76	35	14	2	6							240
	$30,765	$31,071	$31,256	$33,033	$26,146	$42,162							$31,312
25-29	188	192	116	80	21	107							704
	$36,695	$36,876	$37,436	$38,169	$41,004	$34,566							$36,839
30-34	157	174	114	84	37	245							811
	$42,532	$42,286	$41,977	$45,333	$47,557	$44,272							$43,446
35-39	138	107	91	52	24	178							590
	$47,238	$44,092	$46,168	$44,963	$49,262	$49,517							$47,072
40-44	125	108	74	52	29	155							543
	$50,790	$50,615	$49,768	$50,382	$54,611	$51,406							$50,957
45-49	100	70	63	51	25	170							479
	$48,214	$47,994	$53,073	$49,900	$47,865	$49,744							$49,525
50-54	67	78	56	41	31	134							407
	$52,759	$45,693	$41,953	$46,454	$57,403	$52,751							$49,634
55-59	67	52	71	26	18	115							349
	$49,481	$50,226	$53,447	$66,176	$71,547	$51,644							$53,493
60-64	29	36	30	18	5	107							225
	$46,791	$60,426	$52,770	$57,074	$61,177	$53,369							$54,040
65 & Over	8	5	8	10	4	44							79
	$41,616	$56,917	$60,047	$49,816	$51,974	$63,447							$58,172
Total	986	898	658	428	196	1,261							4,427
	$43,709	$43,406	$45,072	$46,677	$52,126	$48,808							$45,962

Average:	Age:	40.16	Number of participants:	Fully vested:	1,261	Males:	2,435
	Service:	3.18		Not Vested:	3,166	Females:	1,992

Distribution of All Active Members by Age and by Years of Service All Employees

Attained Age	0 No. & Avg. Comp.	1 No. & Avg. Comp.	2 No. & Avg. Comp.	3 No. & Avg. Comp.	4 No. & Avg. Comp.	5-9 No. & Avg. Comp.	10-14 No. & Avg. Comp.	15-19 No. & Avg. Comp.	20-24 No. & Avg. Comp.	25-29 No. & Avg. Comp.	30-34 No. & Avg. Comp.	35 & Over No. & Avg. Comp.	Total No. & Avg. Comp.
Under 25	107	76	35	14	2	6							240
	$30,765	$31,071	$31,256	$33,033	$26,146	$42,162							$31,312
25-29	191	193	121	80	22	163	1						771
	$36,619	$36,974	$36,996	$38,169	$40,601	$35,088	$44,262						$36,728
30-34	166	181	122	89	40	467	80	1					1,146
	$42,291	$42,525	$41,547	$44,964	$46,788	$44,087	$40,570	$74,984					$43,254
35-39	146	111	106	64	25	438	183	72	2				1,147
	$47,276	$44,290	$46,636	$44,185	$49,006	$48,992	$49,206	$47,695	$47,445				$47,783
40-44	131	123	89	60	32	395	229	190	73	1			1,323
	$50,155	$49,723	$49,297	$48,036	$53,398	$51,088	$50,654	$47,023	$49,720	$69,950			$49,946
45-49	107	79	70	60	30	416	273	261	259	83	5		1,643
	$48,225	$47,961	$51,811	$47,958	$45,906	$50,717	$51,138	$50,313	$52,374	$50,992	$36,779		$50,519
50-54	79	86	74	71	36	414	297	270	299	227	102	3	1,958
	$50,663	$45,880	$43,332	$49,528	$56,834	$50,381	$50,260	$49,375	$53,825	$51,224	$50,264	$62,240	$50,494
55-59	73	63	83	35	20	354	287	235	323	180	122	37	1,812
	$49,103	$47,426	$54,212	$64,860	$68,339	$52,107	$50,225	$51,938	$54,876	$58,206	$57,497	$60,848	$53,666
60-64	33	41	35	26	5	270	215	202	198	128	53	27	1,233
	$47,307	$59,837	$52,282	$54,075	$61,177	$52,332	$50,160	$52,364	$53,894	$61,485	$59,851	$69,068	$54,035
65 & Over	8	8	10	11	6	132	131	82	90	41	20	15	554
	$41,616	$50,786	$57,312	$52,327	$53,508	$57,066	$54,485	$58,161	$58,525	$65,176	$63,018	$76,782	$57,761
Total	1,041	961	745	510	218	3,055	1,696	1,313	1,244	660	302	82	11,827
	$43,631	$43,505	$45,243	$46,811	$51,228	$49,186	$50,188	$50,616	$53,895	$55,984	$55,490	$66,520	$49,381

Average:	Age:	47.12	Number of participants:	Fully vested:	8,352	Males:	6,352
	Service:	11.16		Not Vested:	3,475	Females:	5,475

Summary of Actuarial Assumptions and Methods

The following methods and assumptions were used in preparing the July 1, 2015, actuarial valuation. These assumptions were adopted by the Board effective for the July 1, 2015 valuation.

1. Valuation Date

   The valuation date is July 1st of each plan year. This is the date as of which the actuarial present value of future benefits and the actuarial value of assets are determined.

2. Actuarial Cost Method

   The actuarial valuation uses the Entry Age Normal actuarial cost method. Under this method, the employer contribution rate is the sum of (i) the employer normal cost rate, and (ii) a rate that will amortize the unfunded actuarial liability.

   a. The valuation is prepared on the projected benefit basis, under which the present value, at the investment return rate assumed to be earned in the future (8.0 percent), of each participant's expected benefit payable at retirement or death is determined, based on his/her age, service, sex and compensation. The calculations take into account the probability of a participant's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his/her terminating with a service, disability, or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active participants is added to the present value of the expected future payments to retired participants and beneficiaries to obtain the present value of all expected benefits payable from the Plan on account of the present group of participants and beneficiaries.

   b. The employer contributions required to support the benefits of the Plan are determined using a level funding approach, and consist of a normal cost contribution and an accrued liability contribution.

   c. The normal contribution is determined using the "entry age normal" method. Under this cost method, a calculation is made to determine the average uniform and constant percentage rate of employer contribution which, if applied to the compensation of each participant during the entire period of his/her anticipated covered service, would be required to meet the cost of all benefits payable on his behalf based on the benefits provisions for new employees hired on or after January 1, 2008.

d. The actuarial accrued liability (AAL) for each member is the difference between their present value of future benefits (PVFB), based on the tier of benefits that apply to the member, and their present value of future normal costs determined using the normal cost rate described in item c above. For inactive and retired members their AAL is equal to their PVFB.

e. The unfunded accrued liability contributions are determined by subtracting the actuarial value of assets from the actuarial accrued liability and amortizing the result over 30 years from the valuation date.

The contribution rate determined by this valuation will not be effective until one year later and the determination of the rate reflects this deferral. It is assumed that there will be no change in the employer normal cost rate due to the deferral, and it is assumed that payments are made uniformly throughout the year.

3. Actuarial Value of Assets

The actuarial value of assets is equal to the market value of assets less a five-year phase in of the excess (shortfall) between expected investment return and actual income. The actual calculation is based on the difference between actual market value and the expected actuarial value of assets each year, and recognizes the cumulative excess return (or shortfall) at a minimum rate of 20% per year. Each year a base is set up to reflect this difference. If the current year's base is of opposite sign to the deferred bases then it is offset dollar for dollar against the deferred bases. Any remaining bases are then recognized over the remaining period for the base (5 less the number of years between the base year and the valuation year). This is intended to ensure the smoothed value of assets will converge towards the market value in a reasonable amount of time.

Expected earnings are determined using the assumed investment return rate and the beginning of year actuarial value of assets (adjusted for receipts and disbursements during the year). The returns are computed net of investment expenses.

4. Economic Assumptions

a. Investment return: 8.00% per year, compounded annually, composed of an assumed 2.50% inflation rate and a 5.50% net real rate of return. This rate represents the assumed return, net of all investment expenses.

b. Salary increase rate: A 2.50% inflation component, plus a 0.75% general increase, plus a service-related component as follows:

Years of Service	Service-related Component	Total Annual Rate of Increase Including 2.50% Inflation Component and 0.75% General Increase Rate
(1)	(2)	(3)
1	2.25%	5.50%
2	2.25	5.50
3	2.75	6.00
4	2.25	5.50
5	1.75	5.00
6	1.50	4.75
7	1.25	4.50
8	1.00	4.25
9	0.75	4.00
10-24	0.50	3.75
25+	0.00	3.25

c. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 3.00% per year. This increase rate is solely due to the effect of inflation on salaries, with no allowance for future membership growth.

5. Demographic Assumptions

a. Retirement Rates

	Expected Retirements per 100 Lives			
	Group A & B Members		Group D Members	
Age	Males	Females	Males	Females
(1)	(2)	(3)	(4)	(5)
45-49	15	12	0	0
50-54	10	11	3	3
55	10	11	4	4
56	10	11	5	5
57	10	11	6	6
58	10	11	7	7
59	10	11	8	8
60	12	11	10	10
61	14	11	13	13
62	16	20	35	35
63	18	18	25	18
64	20	12	18	20
65	20	22	20	20
66-69	20	20	20	19
70-74	20	25	20	19
75+	100	100	100	100

b. DROP Participation

65% of eligible members are assumed to enter DROP.

c. DROP Entry Date

Those active members (not already in DROP) are assumed to enter DROP when first eligible. For members who have already entered DROP, the actual DROP entry date supplied in the data is used.

d. DROP Interest Credit

4.65% per year

e. Mortality rates (active members)

Based on the Retired Pensioners 2000 Mortality Table (combined). Rates are scaled by 90% for male and 80% for female. 90% of the rates are assumed to be for non-service related deaths and 10% for service related deaths.

Sample rates are shown below:

	Rates			
Age	**Non-service related Male**	**Non-service related Female**	**Service related Male**	**Service related Female**
20	0.000279	0.000138	0.000031	0.000015
25	0.000305	0.000149	0.000034	0.000017
30	0.000360	0.000190	0.000040	0.000021
35	0.000626	0.000342	0.000070	0.000038
40	0.000874	0.000508	0.000097	0.000056
45	0.001221	0.000809	0.000136	0.000090
50	0.001732	0.001207	0.000192	0.000134
55	0.002935	0.001956	0.000326	0.000217
60	0.005465	0.003640	0.000607	0.000404
65	0.010317	0.006988	0.001146	0.000776
70	0.017987	0.012054	0.001999	0.001339
75	0.030646	0.020236	0.003405	0.002248

Mortality rates (retired members and beneficiaries):

Healthy Retirees and beneficiaries: Gender-distinct RP2000 Combined Healthy Mortality Tables with Blue Collar Adjustment. Male rates are multiplied by 125% and female rates are multiplied by 112%. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements.

Disabled Retirees: Gender-distinct RP2000 Combined Healthy Mortality Tables with Blue Collar Adjustment. Male rates are multiplied by 125% and female rates are multiplied by 112%. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements. Rates are set-forward five years. A minimum rate of 0.04 is applied to male and 0.03 to female.

Sample rates are shown below:

Attained Age in 2014	**Rates**			
	Healthy Male	**Healthy Female**	**Disabled Male**	**Disabled Female**
45	0.002149	0.001489	0.040000	0.030000
50	0.002891	0.002108	0.040000	0.030000
55	0.005029	0.002918	0.040000	0.030000
60	0.009369	0.004815	0.040000	0.030000
65	0.016403	0.009835	0.040000	0.030000
70	0.027069	0.017625	0.043632	0.030000
75	0.043632	0.029215	0.071367	0.046301
80	0.071367	0.046301	0.116414	0.078599
85	0.116414	0.078599	0.194603	0.131126
90	0.194603	0.131126	0.298126	0.198245
95	0.298126	0.198245	0.412954	0.255008
100	0.412954	0.255008	0.497358	0.328290

f. Termination Rates and Disability Rates

Termination rates (for causes other than death, disability or retirement):

Termination rates are a function of the member's age and service. Termination rates are not applied after a member becomes eligible for a retirement benefit. Rates at selected ages are shown below.

Probability of Decrement Due to Withdrawal – Male Members
Years of Service

Age	0	1	2	3	4	5	6	7	8	9	10+
20	0.3244	0.2682	0.2300	0.2060	0.1926	0.1824	0.1617	0.1507	0.1400	0.1278	0.0541
30	0.2585	0.2146	0.1808	0.1563	0.1396	0.1275	0.1143	0.1057	0.0985	0.0919	0.0449
40	0.2003	0.1645	0.1351	0.1124	0.0954	0.0832	0.0750	0.0683	0.0634	0.0603	0.0357
50	0.1559	0.1258	0.1013	0.0824	0.0681	0.0577	0.0510	0.0454	0.0411	0.0383	0.0265
60	0.1341	0.1083	0.0887	0.0740	0.0634	0.0557	0.0469	0.0407	0.0344	0.0277	0.0173

Probability of Decrement Due to Withdrawal – Female Members
Years of Service

Age	0	1	2	3	4	5	6	7	8	9	10+
20	0.2811	0.2574	0.2344	0.2123	0.1912	0.1711	0.1506	0.1282	0.1040	0.0784	0.1385
30	0.2155	0.1943	0.1736	0.1539	0.1356	0.1188	0.1032	0.0879	0.0730	0.0585	0.0795
40	0.1688	0.1460	0.1250	0.1063	0.0903	0.0770	0.0664	0.0581	0.0517	0.0472	0.0367
50	0.1510	0.1223	0.0984	0.0791	0.0645	0.0544	0.0481	0.0452	0.0453	0.0481	0.0339
60	0.1794	0.1373	0.1049	0.0812	0.0653	0.0570	0.0540	0.0552	0.0601	0.0682	0.0339

Rates of Decrement Due to Disability

Age	Males	Females	Service-related Males	Service-related Females
20	0.000004	0.000006	0.000000	0.000001
25	0.000009	0.000013	0.000001	0.000002
30	0.000073	0.000065	0.000005	0.000008
35	0.000318	0.000102	0.000022	0.000013
40	0.000650	0.000234	0.000045	0.000029
45	0.001259	0.000528	0.000087	0.000066
50	0.002195	0.001256	0.000151	0.000157
55	0.003171	0.002021	0.000219	0.000253
60	0.004188	0.002436	0.000289	0.000305

Rates of disability are reduced to zero once a member becomes eligible for retirement.

6. Other Assumptions

a. Projected payroll for contribution purposes: The aggregate projected payroll for the fiscal year following the valuation date is calculated by increasing the actual payroll paid during the previous fiscal year to all members (actives, terminated and retired) by the payroll growth rate and multiplying by the ratio of current active members to the average number of active members during the previous fiscal year.

b. Percent married: 70% of employees are assumed to be married. (No beneficiaries other than the spouse assumed). The 70% assumption is intended to provide sufficient margin to cover the costs of any surviving children benefits.

c. Age difference: Male members are assumed to be three years older than their spouses, and female members are assumed to be three years younger than their spouses.

d. Percent electing annuity on death (when eligible): All of the spouses of vested, married participants are assumed to elect an annuity.

e. Percent electing deferred termination benefit: Vested terminating members are assumed to elect a refund or a deferred benefit, whichever is more valuable at the time of termination.

f. There will be no recoveries once disabled.

g. No surviving spouse will remarry.

h. Assumed age for commencement of deferred benefits: Members electing to receive a deferred benefit are assumed to commence receipt at the first age at which unreduced benefits are available.

i. Administrative expenses: The administrative expenses of the plan are added into the employer contribution rate as a percentage of payroll.

j. Pay increase timing: Beginning of (fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date.

k. Decrement timing: Decrements of all types are assumed to occur mid-year.

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

m. Decrement relativity: Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

n. Incidence of Contributions**:** Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made.

o. Benefit Service: All members are assumed to accrue 1 year of service each year. Fractional service is used to determine the amount of benefit payable.

p. Retiree Drop Balances Payout Duration: It is assumed that retirees will receive their DROP balances in equal installments over the eight years following retirement.

7. Participant Data

Participant data was supplied on electronic files. There were separate files for (i) active members, (ii) inactive members, and (ii) members and beneficiaries receiving benefits.

The data for active members included birth date, sex, most recent hire date, salary paid during last fiscal year, hours worked by the employee, and employee contribution amounts.

For retired members and beneficiaries, the data included date of birth, sex, amount of monthly benefit, and date of retirement. Also included was the member's Group and for members participating in DROP, their account balances and monthly DROP income.

All healthy and disabled retirees are assumed to have 100% joint and survivor, prorated by the 70% marriage assumption and reflecting the 3 year spousal age differential. All non-children beneficiaries are assumed to have life only benefits and all children beneficiaries' annuities are assumed to stop at age 21.

Salary for the prior fiscal year as well as an annualized rate of pay is provided in the data. The annualized rate increased by one-year's salary increase is the rate of pay the member is assumed to earn in the upcoming fiscal year.

Assumptions were made to correct for missing, or inconsistent data. These had no material impact on the results presented.

8. Group Transfers

We assume no current Group B members will transfer to Group A.

9. Change in Assumptions Since Prior Valuation

The actuarial assumptions were modified since the prior valuation. In particular the investment return assumption was decreased from 8.50% to 8.00%. In addition, the mortality assumption was changed from a static assumption to a generational approach with constant mortality improvement.

Please see our Experience Study Report dated February 25, 2016 for a detailed description of all of the assumption changes and the rationale for the proposed assumption set.

Summary of Plan Provisions

The provisions summarized in this section apply to persons who are members (active employees). Former members may have been covered under different plan provisions, depending on their dates of separation from service.

1. Covered Members

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

Persons who became employees of the City of Houston after September 1, 1981 and prior to September 1, 1999, and elected officials of the City of Houston who assumed office after September 1, 1981 and prior to September 1, 1999, 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 and prior to January 1, 2008 become members of Group A. Certain persons who were or became a Director of a City Department, Chief Administrative Officer, or Executive Director of HMEPS on or after September 1, 1999 and prior to January 1, 2005 participate in Group C. Effective January 1, 2005, all Group C participation ceased and all Group C participants became Group A participants. Accruals earned by Group C participants prior to January 1, 2005 are retained, but all future accruals are based on the Group A formulas.

All future references to Group C participants in this appendix are intended to reflect this change in the Group C status.

Covered employees newly hired on or after January 1, 2008 will be members of Group D.

A former employee who is rehired on or after January 1, 2008 is a member of the group in which such employee participated at the time of his/her immediately preceding separation from service.

2. 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. If there are fewer than seventy-eight biweekly salaries, the FAS is determined by multiplying the average of all biweekly salaries paid to the member during the period of credited service by 26 and dividing the product by 12.

3. Credited Service

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

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

If former Group D and pre-1997 Group B members who forfeited their previous credited service are rehired they will regain a year of forfeited credited service for each year of service earned upon reemployment.

4. Normal Retirement

a. Eligibility

For participants in Group A or Group B, or, a former Group C member who became a Group A member as of January 1, 2005, the earliest of:

(i) age 62 and 5 years of Credited Service

(ii) 5 years of Credited Service, and age plus years of Credited Service equal 70 or more, provided that, prior to January 1, 2005, you had at least five years of credited service and the combination of age and years of credited service was equal to or greater than 68.

(iii) 5 years of Credited Service, and age plus years of Credited Service equal 75 or more with minimum age 50.

For participants in Group D
Age 62 and 5 years of Credited Service

b. Benefit

Prior to January 1, 2005:

Group A: 3.25% of FAS for each of the first 10 years of Credited Service plus 3.50% of FAS for Credited Service greater than 10 years but less than 20 years plus 4.25% of FAS for each year of Credited Service greater than 20 years (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.

Group B: 1.75% of FAS for each of the first 10 years of Credited Service plus 2.00% of FAS for Credited Service greater than 10 years but less than 20 years, plus 2.75% of FAS for each year of Credited Service greater than 20 years (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.

Group C: Double the rate for Group A

All accruals after January 1, 2005:

All accruals under the prior multipliers were frozen as of January 1, 2005 and the following benefit multipliers apply to service on or after that date:

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 (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.

Group B: 1.75% of FAS for each of the first 10 years of Credited Service plus 2.00% of FAS for Credited Service greater than 10 years but less than 20 years, plus 2.50% of FAS for each year of Credited Service greater than 20 years (excludes period of DROP participation). Maximum benefit is 90% of FAS for all future retirees.

Group D: 1.80% of FAS for each of the first 25 years of Credited Service, plus 1.00% of FAS for each year of Credited Service greater than 25 years. Maximum benefit is 90% of FAS for all future retirees.

5. Early Retirement (Group D only)

a. Eligibility
(i) at least ten years of Credited Service; or
(ii) at least five years of Credited Service and a combination of age and service equals or is greater than 75.

b. Benefit
Accrued normal retirement benefit reduced by 0.25% for each month you are less than age 62.

6. Vested Pension

a. Eligibility 5 years of Credited Service.

b. 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 employee contributions, if any, without interest.

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

If the actuarial present value of a pension is less than $20,000, 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 the rules of the plan.

7. 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.

8. Service-Connected Disability Retirement

a. Eligibility Any age

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

9. Non-service-Connected Disability Retirement

a. Eligibility 5 years of Credited Service.

b. Benefit Accrued normal retirement benefit payable immediately.

10. Pre-retirement Survivor Benefits

A. Service-connected

a. Eligibility — Any age or Credited Service

b. Benefit — 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 spouse's 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.

B. Non service-connected

a. Eligibility — 5 years of Credited Service

b. Benefit — Benefits for survivorship of vested Group D members after January 1, 2008:

Death of active employee: If there is a surviving spouse, 100% of accrued pension is payable to the spouse. 10% of accrued pension is payable to each qualifying dependent to a maximum of 20% for all dependents. Surviving spouse's 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.

Death of terminated vested employee (not yet retired): If participant selected Optional Annuity then benefit will be paid based on selected option. If the participant did not select an optional annuity then if there is a surviving spouse the participant will be deemed to have selected the 50% J&S Optional Annuity. If the participant did not select an Optional Annuity and there is no surviving spouse then no benefit is payable.

For all other Groups 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 a surviving spouse would have received subject to a maximum of 100% of a surviving spouse's benefit for all dependents in the aggregate.

11. Postretirement Survivor Benefits

All Groups except Option-Eligible Participants:

If there is a surviving spouse, 100% of the retirement benefit 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.

Option-Eligible Participants:

Life only to the retiree. Option-Eligible Participants may elect other options based on actuarial factors.

All Group D members, Group A & B members who terminate after June 30, 2011 eligible for a normal retirement benefits and who are not married at their termination of service, and Group B members who terminated prior to September 1, 1997 and who are eligible for a normal retirement benefit are Option-Eligible Participants.

12. Benefit Adjustments

Each year, effective February 1, monthly benefits will be increased 3.0%, not compounded, for all retirees and survivors. This will affect all members currently in payment status and members who enter payment status in the future. For members hired on or after January 1, 2005 future increases will be 2.0%, not compounded.

However, pre-2005 retirees who are rehired will receive a 3% COLA on their subsequent benefit instead.

Group D Members:

None assumed.

13. Contribution Rates.

a. Members — 5% of salary only for Group A members. None for Group B or Group D members.

b. 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% of covered payroll or twice the contribution rate a Group A member is required to make by statute. Under the ARM&CA between the Board and the City of Houston, the City will contribute the greater of $108.5 million or 21.36% of payroll in fiscal year 2013. Contributions in future fiscal years increase by the greater of $10 million or 2% of payroll over the prior year's rate until such time that the City's contribution rate equals the actuarially determined contribution rate.

14. Deferred Retirement Option

a. Eligibility — Participants (other than Group D) who are eligible to retire but who have not retired and who remain in service with the City may participate in the DROP.

b. Monthly DROP Credit

An amount equal to the 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 calendar day each month.

c. DROP Credit Interest

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 and posted monthly on the last calendar day of each month. Effective January 1, 2005, the annual interest rate effective beginning January 1 each year is half of HMEPS' investment return percentage for the prior fiscal year, not less than 2.5% and not greater than 7.5%.

d. DROP Credits-COLA

On or after January 1, 2005:

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 by 3.0%, not compounded.

The Monthly DROP Credit for participants who were first hired on or after January 1, 2005 who entered the DROP effective on or before January 1 of the then current year will be increased effective February 1 each year by 2.0%, not compounded.

e. DROP Account Balance

The sum of a participant's Monthly DROP (DROP Benefit) Credits, Monthly DROP Credit Adjustments, applicable interest, and employee contributions as applicable.

15. DROP Benefit Pay-out

A terminated DROP participant may elect to:

a. Receive the entire DROP Account Balance in a lump sum.
b. Receive the DROP Account Balance in periodic payments as approved by the Pension Board.
c. Receive a portion of the DROP Account balance in a lump sum and the remainder in periodic payments as approved by the Pension Board.
d. Receive a partial payment of not less than $1,000, no more than once each ninety (90) days.
e. Defer election of a payout option until a future date.

16. Post DROP Retirement

The Final Pension is the accrued normal retirement benefit as of the effective date of DROP participation, increased with COLAs since DROP entry.

Changes in Plan Provisions Since Prior Year

No changes since the prior valuation.