GRS Gabriel Roeder Smith & Company
Consultants & Actuaries

HOUSTON POLICE OFFICERS' PENSION SYSTEM

ACTUARIAL VALUATION REPORT

FOR THE YEAR BEGINNING JULY 1, 2016

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
5605 N. MacArthur Blvd.
Suite 870
Irving, TX 75038-2631
469.524.0000 phone
469.524.0003 fax
www.gabrielroeder.com

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Board of Trustees
Houston Police Officers' Pension System
602 Sawyer
Suite 300
Houston, TX 77007

Subject: Actuarial Valuation Report as of July 1, 2016

Dear Members of the Board:

We are pleased to present our Report of the actuarial valuation of the Houston Police Officers' Pension System ("HPOPS" or "the System") for the plan year commencing July 1, 2016. This Report describes the current actuarial condition of HPOPS, determines the calculated employer contribution rate (the actuarially determined rate), and analyzes changes in this contribution rate from the prior year. Valuations are prepared annually, as of July 1st, the first day of the HPOPS' plan year.

Financing objectives and funding policy

Under the HPOPS statute, the employer contribution rate is determined actuarially, based on the Board's funding policy and HPOPS' 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, 2016 actuarial valuation will be used by the Board when determining the employer contribution rate for the year beginning July 1, 2017 and ending June 30, 2018.

Under the 2011 Meet & Confer Agreement between the Board and the City of Houston, a funding schedule was implemented resulting in a minimum $83 million employer contribution for the fiscal year ending June 30, 2012, increasing by $10 million each year thereafter until HPOPS' funded ratio reaches 100%. Therefore, under the terms of the Meet & Confer, an amount of $133 million is scheduled to be contributed for the fiscal year ending 2017.

For FY2012, the City of Houston contributed $17 million less than required under the Meet & Confer. This amount, with interest, was fully paid by the City in FY2016. For FY2013, the City contributed $8.5 million less than required which, again, was to be financed at an annual interest rate of 8.5%. This amount, with interest, was also fully paid by the City in FY2016.

In addition, once the System reaches an 80% funded status (the ratio of the actuarial value of assets to the actuarial accrued liability), the City will make additional payments in the fiscal year following a determination that the System has fallen below this 80% threshold. The funded ratio as of the June 30, 2015 actuarial valuation was 79.7% resulting in a contribution receivable from the City of $14.284 million. Finally, once the System reaches the actuarially determined rate, the City will pay the actuarially determined rate, but not less than 16.0% of payroll.

Given the above schedule under the terms of the Meet & Confer Agreement, the actual employer contribution amount for the fiscal year ending June 30, 2018 will not be set by this actuarial valuation as of July 1, 2016. Therefore, the actuarially calculated contribution rate determined by this valuation will not be contributed by the City of Houston. Based upon projected active member payroll of approximately $420 million for FY2017, the City's calculated contribution amount should be approximately $175 million. Instead, the City will only contribute $133 million for FY2017 under the terms of the above funding schedule, as detailed in the 2011 Meet & Confer Agreement. **In addition, the funded ratio remains below the 80% threshold; therefore, an additional appropriation to the System from the City of $148.576 million for FY2018 should be contributed, per the 2011 Meet & Confer Agreement.**

The contribution rate and liabilities are computed using the Projected Unit Credit (PUC) actuarial cost method. The employer contribution rate is the sum of two pieces: the employer normal cost rate and the amortization rate. The normal cost rate is determined as a percentage of active member payroll, with the employer normal cost being the difference between the total normal cost and the weighted member contribution rate. The amortization rate is determined as a level percentage of active member payroll. It is the amount required to amortize the unfunded actuarial accrued liability (UAAL) over an open period (30 years as of July 1, 2016). The amortization period is set by statute, and was modified under the Meet and Confer Agreement.

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, 2016 is 77.5% which is a decrease from 79.7% last year primarily due to asset losses, as the return of 4.43% on the actuarial value of assets was significantly less than the assumed rate of 8.0%. The funded ratio measured on the market value of assets is a lower percentage at 67.9% as of July 1, 2016. The funded status alone may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Based on the current scheduled funding policy as set forth in the 2011 Meet and Confer Agreement, the System is projected to be 100% funded in approximately 20 years, or in year 2036. This is three years shorter than the funding period determined in the prior valuation. However, this amortization schedule is based upon proportionately larger contributions in future years, again, according to the current Meet and Confer Agreement. In particular, it is assumed that the City will make additional contributions to the System in accordance with the 80% funded ratio threshold, as described above, as these additional contributions become due. Using the FY2017 City contribution level amount only, and projecting this same contribution level going forward, would calculate to a single equivalent amortization period that would not be a determinable number. If all assumptions are met, the employer normal cost as a percentage of pay will decrease to the level of the newest tier of benefits (employees hired after October 9,

2004) which is approximately 9.30% (including administrative expenses).

The calculated employer (City of Houston) contribution rate for FY 2018 is 41.74%. This rate is greater than the 39.59% rate calculated in the July 1, 2015 actuarial valuation report. This is primarily due to the loss associated with the 4.43% return on the actuarial value of assets compared to an assumed rate of 8.00%, but it also stems from the calculated contribution rate not being consistently contributed to the System by the City. Please see Table 6 under Section III of our Report for a detailed analysis of the change in the calculated employer contribution rate from the prior year to this year.

The contribution rate is determined using an actuarial value of assets rather than market value. The actuarial value of assets recognizes 20% of the difference (typically referred to as "five year smoothing") between the market value of assets and the expected actuarial value of assets, based upon the assumed valuation rate of return of 8.00% per annum. There are currently $581.7 million in asset losses being deferred that will be recognized in the future and provide some headwinds to improvement in the funded status absent future asset gains. As can be seen in Table 7 of Section III, there has been a significant increase in projected employer contributions, primarily due to the FY2016 asset experience and the resulting 80% funded ratio trigger contribution.

Benefit provisions

The benefit provisions reflected in this valuation are those which were in effect on July 1, 2016. There were no changes in the benefit provisions since the prior valuation. The benefit provisions are summarized in Appendix B of our Report.

Assumptions and methods

Actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the System's actuary. The assumptions used in this valuation were adopted by the Board based on the recommendations from GRS during the Actuarial Experience Investigation Study review following the July 1, 2013 actuarial valuation and were first used in the July 1, 2014 actuarial valuation. Since then, there have been no changes from the revised assumption set first adopted by the Board for the July 1, 2014 actuarial valuation.

The results of the actuarial valuation are dependent upon the actuarial assumptions used. Actual results 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 presented in our Report are intended to provide information for rational decision making.

The actuarial assumptions and methods used in this Report all comply with the actuarial standards of practice (ASOPs)and are described in Appendix A of our Report.

Data

Member data for retired, active and inactive members was supplied as of July 1, 2016 by the HPOPS 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. GRS is not responsible for the accuracy or completeness of the information provided to us.

Asset and all financial information as of July 1, 2016 were supplied to us by the HPOPS staff.

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 under Section III of our Report.

Actuarial Certification

All of the tables contained in this actuarial valuation report and in the actuarial section of the HPOPS Comprehensive Annual Financial Report (CAFR) were prepared by Gabriel, Roeder, Smith & Company. Historical information for years prior to 2008 was prepared by the prior actuarial firm and was not subjected to our actuarial review. We certify that the information presented herein is accurate and fairly portrays the actuarial position of HPOPS as of July 1, 2016.

All of our work conforms with generally accepted actuarial principles and practices, and to 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 the Statements of the Governmental Accounting Standards Board. The undersigned are independent actuaries and consultants. All of the undersigned are Enrolled Actuaries, Members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries. Finally, all of the undersigned are experienced in performing valuations for large public retirement systems.

Respectfully submitted,
Gabriel, Roeder, Smith & Company

Mark R. Randall

Mark R. Randall, FCA, EA, MAAA
Chief Executive Officer

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

Bradley E. Stewart, ASA, EA, MAAA
Consultant

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SECTION I

EXECUTIVE SUMMARY

Executive Summary

Item	July 1, 2016	July 1, 2015
Membership (millions)		
• Number of:		
- Active members	5,261	5,261
- Retirees and beneficiaries	3,876	3,698
- Inactive members	32	28
- Total	9,169	8,987
• Annualized Payroll supplied by HPOPS	$ 407,058	$ 395,360
Calculated Contribution rates		
• Employer	41.74%	39.59%
• Member[1]	9.46%	9.41%
Assets ($000s)		
• Market value	$ 4,080,460	$ 4,304,523
• Actuarial value	4,662,115	4,550,620
• Estimation of return on market value	-3.2%	0.8%
• Estimation of return on actuarial value	4.4%	6.7%
• Employer contribution	$ 137,392	$ 113,665
• Member contribution	$ 39,017	$ 37,719
• Ratio of actuarial value to market value	114.3%	105.7%
Actuarial Information ($000s)		
• Employer normal cost %	20.71%	21.07%
• Unfunded actuarial accrued liability (UAAL)	$ 1,350,934	$ 1,155,510
• Amortization rate	21.03%	18.52%
• Funding period	30.0 years	30.0 years
• Funded ratio	77.5%	79.7%
Projected employer contribution based on calculated rate		
• Fiscal year ending June 30,	2017	2016
• Projected payroll (millions)	$ 418.3	$ 406.2
• Projected employer contribution (millions) (actual contribution rate set by Meet & Confer)	$ 174.6	$ 160.8

[1] Employee contribution rate is 9.00%. Members hired after October 9, 2004 contribute 10.25% of pay.

SECTION II

DISCUSSION

Contribution Requirements

- The above Executive Summary shows the calculated contribution rate for FY 2018 to be 41.74% of active member payroll
  - An increase from 39.59% of active member payroll for FY 2017
  - The most significant factors in the increase in the rate were the asset loss from the return on the actuarial value of assets of 4.43% compared with the assumed 8.00% and the calculated contribution rate not being contributed to the System.
  - Moreover, due to the terms of the 2011 Meet & Confer Agreement, the City of Houston employer contribution rate continues to fall far short of the Actuarially Determined Contribution (ADC), the "calculated contribution rate". As can be seen from the exhibit on page 24 under Section III of this Report (Table 16), the City's recent employer contribution rate has increased to over 30% of active member payroll but is over 4% of pay lower than the calculated rate.
  - Rates shown on the Executive Summary are calculated rates for the twelve-month period beginning July 1, 2017, based on current board policy
  - Table 6 under Section III of our Report reconciles the calculated contribution rate from the prior valuation date to the current valuation date
- **In addition, the funded ratio remains below the 80% threshold, so there should be an additional appropriation to the System from the City of $148.576 million for FY2018, per the 2011 Meet & Confer Agreement.**
- There were no changes to the benefit provisions reflected in this actuarial valuation
- There were no changes to the actuarial assumptions reflected in this actuarial valuation.
- The amortization payment is based upon the following assumptions:
  - 30-year open funding period beginning July 1, 2016
  - Dollar contribution amounts increase as a level percentage of payroll
  - Total payroll increases 2.75% per year
  - No future growth in the number of active members is taken into account

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 typically come from investment income). HPOPS receives contributions from two sources, employer contributions which are currently based on a fixed schedule and member contributions which are determined as a percentage of pay. As shown in Table 2 under Section III of our Report, the employer contribution rate has two components:

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

The normal cost is the present value of the portion of projected benefits that is attributable to service accrued in the current year. The NC% is shown in Table 4 under Section III of our Report.

Members are required to make employee contributions and only the excess of the NC% over the member contribution rate is included in the employer contribution rate.

The actuarial accrued liability (AAL) is the difference between (i) the actuarial present value of all future benefits for the 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 Meet & Confer Agreement has specified that this amortization should be over a period of 30 years beginning July 1, 2016. Item 11a of Table 2 in Section III of our Report shows the UAAL%.

This Actuarially Determined Contribution (ADC) is used in determining the contributions necessary for the twelve-month period beginning July 1, 2017. Note, however, that under the terms of the 2011 Meet and Confer Agreement, the FY2018 contribution is already set at $143 million preceded by a City contribution of $133 million for FY2017. As detailed in this Report, these contribution levels continue to fall far short of the actuarially calculated contribution rate.

Financial Data and Experience

As of July 1, 2016, HPOPS has a total market value of about $4.08 billion. Financial information was gathered from the HPOPS staff.

Our Report includes a number of Exhibits related to plan assets. Table 8 under Section III of our Report shows how the total market value is distributed among the various classes of investments. Currently, 32.0% of invested assets are held in equities, compared with 19.1% last year and compared with a 50.25% investment policy target. 4.1% of invested assets are held in fixed income securities, compared with 5.3% last year and compared with a 12% investment policy target.

Table 9 under Section III of our Report shows a reconciliation of the market values between the beginning and end of FY2016.

During FY2016, the dollar-weighted total investment return on the market value of assets (MVA) was -3.19%, net of investment expenses, as shown in Table 11 under Section III of our Report. The Comprehensive Annual Financial Report (CAFR) states the time-weighted return for FY2016 was -3.1%.

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. The AVA recognizes 20% of the difference between the projected actuarial value (based on last year's annual assumed 8.00% investment return rate) and the market value at the valuation date. This is an approximation of five year smoothing and is intended to help reduce the volatility of the contribution rates from year to year.

The development of the AVA is shown in Table 10 under Section III of our Report. The AVA is $4.66 billion. The AVA is 114.3% of the MVA, compared to 105.7% last year.

In addition to the market return, Table 11 also shows the return on the actuarial value of assets for HPOPS. For FY2016, this return was 4.43%. Because this is less than the assumed 8.00% investment return, an actuarial loss occurred increasing the unfunded actuarial accrued liabilities of the System by $161 million. Table 13 shows a historical summary of market and actuarial return rates in recent years.

Member Data

Member data as of July 1, 2016 was supplied electronically by the HPOPS 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.

Table 19 under Section III of our Report shows the number of members by category (active, inactive, retired, etc.). Tables 20a-d show active member statistics by Group. Tables 17 and 18 show summaries of certain historical data, including membership statistics.

The number of active and DROP members was 5,261 as of July 1, 2016 and was unchanged from July 1, 2015.

The total payroll shown on the statistical tables is the amount that was supplied by HPOPS, annualized, if necessary. For the cost calculations, the pay amounts were adjusted in accordance with the actuarial assumptions to reflect one year's salary increase.

Total active member payroll increased 2.96% last year, compared with a 1.70% increase the prior year.

The rate of payroll growth is significant because the methodology used in the valuation to amortize the unfunded actuarial accrued liability assumes a growing payroll into the future. If the payroll does not grow at the assumed 2.75% per year average, the current amortization payments may be understated and the funding position of the System will not strengthen over time.

Benefit Provisions

Appendix B of our Report includes a summary of the benefit provisions for HPOPS.

– *Normal Retirement Eligibility*

- Sworn Prior to October 9, 2004 – 20 years of service
- Sworn on or after October 9, 2004 – Age 55 with 10 years of service

– *Normal Retirement Benefit*

- Sworn Prior to October 9, 2004 – 2.75% of average direct pay for the first 20 years of service and 2% for each year after 20
- Sworn on or after October 9, 2004 – 2.25% for the first 20 years of service and 2% for each year after 20 up to a maximum of 80%

– *Normal Form of Payment* is a 100% Joint & Survivor Annuity for married retirees and Life Annuity for unmarried retirees

– *Employee Contributions* are required

- Sworn Prior to October 9, 2004 – 9.00% of pay.
- Sworn on or after October 9, 2004 – 10.25% of pay

– *Post-retirement Cost of Living Adjustments (COLA) are* granted each year on April 1 and is calculated at 80% of the change in the CPI (Consumer Price Index) for the previous calendar year. However, the COLA can never be less than 2.4% or greater than 8.0%. This COLA is applied to retirement, survivor and DROP benefits, and is included in the benefit payment made at the end of April.

– *Insurance Benefit* - Retired members and surviving spouses are entitled to receive an additional stipend of $150.00 per month to help offset the cost of medical insurance premiums

This valuation reflects all benefits offered to HPOPS members. There are no ancillary benefits that might be deemed a HPOPS liability if continued beyond the availability of funding by the current funding source. There were no changes in benefit provisions since the prior valuation.

Actuarial Methods and Assumptions

Appendix A of our Report includes a summary of the actuarial assumptions and methods used in this valuation. Costs are determined using the Projected Unit Credit (PUC) actuarial cost method. The assumed annual investment rate is 8.00% net of investment expenses.

Please see Appendix A of our Report for a complete description of these assumptions. For a detailed analysis of the actuarial assumptions of the System, please see our separate 2014 Experience Investigation Study Report, dated October 24, 2014.

SECTION III

SUPPORTING EXHIBITS

Summary of Cost Items ($000)

	Valuation as of July 1, 2016		Valuation as of July 1, 2015	
	Cost Item	Cost as % of Pay	Cost Item	Cost as % of Pay
	(1)	(2)	(3)	(4)
1. Participants				
a. Active participants, hired post 10/9/2004	2,282		2,083	
b. Active participants enrolled in DROP	2,057		1,991	
c. Other active participants	922		1,187	
d. Retirees	3,002		2,873	
e. Disabled retirees	161		154	
f. Beneficiaries	713		671	
g. Inactive, deferred vested	32		28	
h. Total	9,169		8,987	
2. Projected valuation payroll	$ 418,252		$ 406,233	
3. Averages for active members				
a. Average age	42.6		42.8	
b. Average years of service	15.7		15.9	
c. Average pay ($)	$ 79,500		$ 77,216	
4. Present value of future pay	$ 3,790,086		$ 3,630,032	
5. Total normal cost rate	30.17%		30.48%	
6. Present value of future benefits	$ 7,082,728	1693.4%	$ 6,761,394	1664.4%
7. Present value of future normal costs	$ 1,069,679	255.8%	$ 1,055,264	259.8%
8. Actuarial accrued liability (6 - 7)	$ 6,013,049	1437.7%	$ 5,706,130	1404.6%
9. Present actuarial assets	$ 4,662,115	1114.7%	$ 4,550,620	1120.2%
10. Unfunded actuarial accrued liability (UAAL)	$ 1,350,934	323.0%	$ 1,155,510	284.4%
11. Funding period	30		30	
12. Employer contribution rate				
a. Normal cost	20.71%		21.07%	
b. Amortization charge	21.03%		18.52%	
c. Total	41.74%		39.59%	
13. Average estimated return				
a. Based on market value	-3.19%		0.82%	
b. Based on actuarial value	4.43%		6.65%	
14. Funded ratio	77.5%		79.7%	

Calculation of Actuarially Determined Contribution Rate ($000)

			July 1, 2016	July 1, 2015
			(1)	(2)
1.	Annualized payroll supplied by HPOPS		$ 407,058	$ 395,360
2.	Projected valuation payroll (adjusted for one-year's payroll growth)		$ 418,252	$ 406,233
3.	Present value of future pay		$ 3,790,086	$ 3,630,032
4.	Employer normal cost rate (Table 4)		20.71%	21.07%
5.	Actuarial accrued liability for active members			
	a.	Present value of future benefits for active members	$ 3,662,645	$ 3,629,740
	b.	Less: present value of future employer normal costs	(701,755)	(704,915)
	c.	Less: present value of future employee contributions	(367,924)	(350,349)
	d.	Actuarial accrued liability	$ 2,592,966	$ 2,574,476
6.	Total actuarial accrued liability for:			
	a.	Retirees and beneficiaries	$ 3,413,136	$ 3,125,977
	b.	Inactive participants	6,947	5,677
	c.	Active members (Item 5d)	2,592,966	2,574,476
	d.	Total	$ 6,013,049	$ 5,706,130
7.	Actuarial value of assets (Table 10)		$ 4,662,115	$ 4,550,620
8.	Unfunded actuarial accrued liability (UAAL) (Item 6d - Item 7)		$ 1,350,934	$ 1,155,510
9.	Funding period		30 years	30 years
10.	Assumed payroll growth rate		2.75%	2.75%
11.	Employer Contribution requirement			
	a.	UAAL amortization payment as % of pay	21.03%	18.52%
	b.	Employer normal cost	20.71%	21.07%
	c.	Contribution requirement (a + b)	41.74%	39.59%

Actuarial Present Value of Future Benefits ($000)

			July 1, 2016 (1)	July 1, 2015 (2)
1.	Active members, hired post 10/9/2004			
	a.	Retirement benefits	$ 446,871	$ 382,292
	b.	Deferred termination benefits	0	0
	c.	Refunds	6,682	6,047
	d.	Death benefits	39,350	34,489
	e.	Disability benefits	31,488	27,571
	f.	Total	$ 524,391	$ 450,399
2.	Active members enrolled in DROP			
	a.	Retirement benefits	$ 2,456,671	$ 2,343,974
	b.	Deferred termination benefits	0	0
	c.	Refunds	0	0
	d.	Death benefits	39,034	37,017
	e.	Disability benefits	0	0
	f.	Total	$ 2,495,705	$ 2,380,991
3.	Other active members			
	a.	Retirement benefits	$ 619,169	$ 769,443
	b.	Deferred termination benefits	448	553
	c.	Refunds	392	498
	d.	Death benefits	18,812	23,285
	e.	Disability benefits	3,728	4,571
	f.	Total	$ 642,549	$ 798,350
4.	Members in Pay Status			
	a.	Service retirements	$ 3,002,711	$ 2,742,092
	b.	Disability retirements	107,777	103,892
	c.	Beneficiaries	302,648	279,993
	d.	Total	$ 3,413,136	$ 3,125,977
5.	Inactive members		$ 6,947	$ 5,677
6.	Total actuarial present value of future benefits		$ 7,082,728	$ 6,761,394

Analysis of Normal Cost Rate

		July 1, 2016 (1)	July 1, 2015 (2)
1.	Gross normal cost rate		
	a. Retirement benefits	27.02%	27.65%
	b. Deferred termination benefits	0.01%	0.01%
	c. Refunds	0.19%	0.18%
	d. Disability benefits	0.63%	0.59%
	e. Death benefits	1.19%	1.17%
	f. Total	29.04%	29.60%
2.	Plus: Administrative expenses as percentage of payroll	1.13%	0.88%
3.	Less: weighted average of member contribution rate	9.46%	9.41%
4.	Employer normal cost rate (Item 1f + Item 2 - Item 3)	20.71%	21.07%

Calculation of Total Actuarial Gain or Loss

1.	Unfunded actuarial accrued liability (UAAL) as of July 1, 2015	$	1,155,510
2.	Total normal cost for year		123,820
3.	Actuarially calculated contribution requirement		(199,054)
4.	Interest on UAAL for one year		92,441
5.	Interest on Item 2 and Item 3 for one-half year		(2,951)
6.	Actuarially expected UAAL as of July 1, 2016 (1+2+3+4+5)	$	1,169,766
7.	Actual UAAL as of July 1, 2016		1,350,934
8.	Actuarial gain/(loss) for the period (6 - 7)	$	(181,168)
	<u>SOURCE OF GAINS/(LOSSES)</u>		
9.	Asset gain/(loss) (See Table 12)	$	(160,795)
10.	Impact of contributions less than actuarially determined		(22,645)
11.	Changes to Asset Valuation Method		-
12.	Changes Due to Experience Study		-
13.	Total liability gain/(loss) for the period		2,272
14.	Actuarial gain/(loss) for the period	$	(181,168)

Note: Dollar amounts in $000

Change in Calculated Contribution Rate Since the Prior Valuation

1.	Calculated Contribution Rate as of July 1, 2015			39.59%
2.	Change in Contribution Rate During Year			
	a.	Change in Employer Normal Cost	(0.36%)	
	b.	Assumption changes	0.00%	
	c.	Recognition of prior asset losses (gains)	0.98%	
	d.	Actuarial (gain) loss from current year asset performance	1.57%	
	e.	Actuarial (gain) loss from liability sources	(0.06%)	
	f.	Impact of City contributing different than actuarially determined	0.38%	
	g.	Effect of Payroll growing slower than Payroll Growth Rate	(0.05%)	
	h.	Effect of resetting amortization period to 30	(0.31%)	
	i.	Total Change		2.15%
3.	Calculated Rate as of July 1, 2016			41.74%

Near Term Outlook

Valuation as of July 1,	Unfunded Actuarial Accrued Liability (UAAL, in 000s)	Funded Ratio	Calculated Contribution Rate	Funding Period (Years)[2]	Market Value of Fund (in 000s)	For Fiscal Year Ending June 30,	Covered Compensation	Employer Contributions	Employee Contributions	Benefit Payments and Refunds	Net External Cash Flow
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2016	$ 1,351,248	77.5%	41.74%	30.0	$ 4,080,460	2017	$ 418,252	$ 281,576	$ 39,567	$ 352,759	$ (31,617)
2017	1,425,372	77.2%	42.12%	30.0	4,374,016	2018	422,415	316,877	40,097	385,094	(28,120)
2018	1,475,173	77.3%	42.09%	30.0	4,694,692	2019	428,495	330,740	40,812	419,189	(47,638)
2019	1,519,189	77.3%	41.88%	30.0	5,020,724	2020	435,697	342,170	41,643	453,163	(69,351)
2020	1,495,333	78.3%	40.59%	30.0	5,350,257	2021	443,645	289,326	42,554	488,540	(156,660)
2021	1,425,319	79.8%	38.56%	30.0	5,615,351	2022	452,268	194,518	43,539	524,952	(286,895)
2022	1,438,344	80.1%	37.67%	30.0	5,766,208	2023	461,468	193,000	44,592	561,797	(324,205)
2023	1,445,442	80.3%	36.64%	30.0	5,890,332	2024	470,906	203,000	45,685	600,211	(351,526)
2024	1,435,957	80.7%	35.34%	30.0	5,995,971	2025	480,938	213,000	46,848	638,719	(378,870)
2025	1,410,774	81.2%	33.84%	30.0	6,081,624	2026	491,347	223,000	48,062	677,880	(406,818)
2026	1,370,251	81.8%	32.14%	30.0	6,145,063	2027	502,515	233,000	49,358	574,387	(292,029)

Statement of Plan Net Assets ($000)

	July 1, 2016 (1)		July 1, 2015 (2)	
A. ASSETS				
1. Current Assets				
a. Cash and short term investments				
1) Cash on hand	$	304	$	352
2) Short term investments		650,902		915,270
b. Accounts Receivable				
1) Members		1,396		1,169
2) Investments		2,613		2,872
3) Due from Brokers		23,643		1,712
4) Other		13		9
c. Total Current Assets	$	678,871	$	921,384
2. Long Term Investments				
a. Fixed Income	$	166,655	$	225,728
b. Equity Securities		1,303,740		817,127
c. Alternative Investments		1,919,630		2,319,640
d. Foreign Currency Contracts		0		0
e. Total long term investments	$	3,390,025	$	3,362,495
3. Other Assets				
a Collateral on securities lending	$	24,211	$	50,613
b. Furniture, fixtures and equipment, net		0		0
c. City of Houston Contribution Receivable		14,284		25,500
d. Accrued interest on note receivable		0		0
e. Total other assets	$	38,495	$	76,113
4. Prepaid Management Fees	$	0	$	0
5. Total Assets	$	4,107,391	$	4,359,992
B. LIABILITIES				
1. Current Liabilities				
a. Foreign Currency Contracts	$	0	$	0
b. Due to Brokers		894		3,357
c. Securities Lending Collateral		24,211		50,613
d. Accrued Professional and Investment Fees		1,172		878
e. Other Liabilities		654		623
2. Total Liabilities		26,931		55,471
3. Net Assets Held in Trust	$	4,080,460	$	4,304,521
C. ASSET ALLOCATION FOR CASH & LONG TERM INVESTMENTS				
1. Current Assets		16.7%		21.5%
2. Fixed Income		4.1%		5.3%
3. Equity Securities		32.0%		19.1%
4. Alternative Investments		47.2%		54.1%
5. Total		100.0%		100.0%

Reconciliation of Plan Net Assets ($000)

				Year Ending			
				July 1, 2016		July 1, 2015	
				(1)		(2)	
1.	a.		Market value of assets at beginning of year	$	4,304,521	$	4,347,877
	b.		Adjustment		2		0
	c.		Adjusted Market value of assets	$	4,304,523	$	4,347,877
2.	Revenue for the year						
	a.		Contributions				
		i.	Member contributions	$	39,017	$	37,719
		ii.	Employer contributions		137,392		113,665
		iii.	Total	$	176,409	$	151,384
	b.		Net investment income				
		i.	Dividends	$	18,714	$	20,713
		ii.	Short Term Investments		2,218		993
		iii.	Fixed Income		10,104		15,163
		iv.	Net appreciation (depreciation) on investments		(152,667)		21,315
		v.	Securties lending income		250		123
		vi.	Securties lending expense		(65)		(31)
		vii.	Less investment expenses		(14,387)		(22,937)
		viii.	Other		0		-
	c.		Total revenue	$	40,576	$	186,723
3.	Expenditures for the year						
	a.		Refunds	$	978	$	945
	b.		Benefit payments		259,076		225,656
	c.		Administrative and miscellaneous expenses		4,585		3,478
	d.		Total expenditures	$	264,639	$	230,079
4.	Increase in net assets (Item 2c - Item 3d)			$	(224,063)	$	(43,356)
5.	Market value of assets at end of year (Item 1c + Item 4)			$	4,080,460	$	4,304,521

Development of Actuarial Value of Assets ($000)

		Year Ending June 30, 2016
1.	Actuarial value of assets at beginning of year	$ 4,550,620
2.	Net new investments	
	a. Contributions	$ 176,409
	b. Benefits and refunds paid	(260,054)
	c. Administrative expenses	(4,585)
	d. Subtotal	$ (88,230)
3.	Assumed investment return rate for fiscal year	8.00%
4.	Assumed investment return rate for fiscal year (Item 1 + Item 2 / 2) x Item 3	$ 360,520
5.	Expected Actuarial Value at end of year (Item 1+ Item 2 + Item 4)	$ 4,822,910
6.	Market value of assets at end of year	$ 4,080,460
7.	Difference (Item 6 - Item 5)	$ (742,450)

8. Development of amounts to be recognized as of June 30, 2016:

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)
2012	$ 0	$ 0	$ 0	1	$ 0	$ 0
2013	0	0	0	2	0	0
2014	0	0	0	3	0	0
2015	(246,099)	0	(246,099)	4	(61,525)	(184,574)
2016	(496,351)	0	(496,351)	5	(99,270)	(397,081)
Total	$ (742,450)	$ 0	$ (742,450)		$ (160,795)	$ (581,655)

9.	Actuarial value of plan assets, end of year (Item 6 - Item 8)	$ 4,662,115
10.	Asset gain (loss) for year (Item 9 - Item 5)	$ (160,795)
11.	Asset gain (loss) as % of actual actuarial assets	(3.45%)
12.	Ratio of actuarial value to market value	114.3%

Notes: Remaining deferrals in Column (1) for prior years are from last year's report column (6). The number in the current year is the difference between the remaining deferrals in 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 Dollar-Weighted Investment Return ($000)

Item	Market Value	Actuarial Value
(1)	(2)	(3)
1. Assets as of July 1, 2015	$ 4,304,523	$ 4,550,620
2. Contributions during FY2016	176,409	176,409
3. Benefit payments made during FY2016	259,076	259,076
4. Refunds of contributions during FY2016	978	978
5. Administrative Expenses during FY2016	4,585	4,585
6. Investment return during FY2016	(135,833)	199,725
7. Assets as of July 1, 2016: (1 + 2 - 3 - 4 - 5 + 6)	4,080,460	4,662,115
8. Approximate rate of return on average invested assets		
a. Net investment income	(135,833)	199,725
b. Net investment return FY 2016	-3.19%	4.43%

Investment Experience Gain or Loss ($000)

Item	Valuation as of 6/30/2016	Valuation as of 6/30/2015
(1)	(2)	(3)
1. Actuarial assets, prior valuation	$ 4,550,620	$ 4,342,936
2. Total contributions since prior valuation	$ 176,409	$ 151,384
3. Benefits and refunds since prior valuation	$ (260,054)	$ (226,601)
4. Administrative expenses since prior valuaton	$ (4,585)	$ (3,478)
5. Assumed net investment income		
a. Beginning assets	$ 364,049	$ 347,435
b. Contributions	7,056	6,055
c. Benefits and refunds paid	(10,402)	(9,064)
d. Administrative expenses	(183)	(139)
e. Total	$ 360,520	$ 344,287
6. Expected actuarial assets (Sum of Items 1 through 5)	$ 4,822,910	$ 4,608,528
7. Actual actuarial assets, this valuation	$ 4,662,115	$ 4,550,620
8. Asset gain (loss) since prior valuation (Item 7 - Item 6)	$ (160,795)	$ (57,908)

Note: Dollar amounts in $000

History of Investment Returns

For Fiscal Year Ending	Market Value [1]	Actuarial Value	For Fiscal Year Ending	Market Value [1]	Actuarial Value
(1)	(2)	(3)	(4)	(5)	(6)
June 30, 1976 [2]	8.60%	N/A	June 30, 1996 [2]	17.44%	N/A
June 30, 1977 [2]	2.90%	N/A	June 30, 1997 [2]	17.15%	N/A
June 30, 1978 [2]	2.20%	N/A	June 30, 1998 [2]	14.26%	(0.46%)
June 30, 1979 [2]	7.90%	N/A	June 30, 1999 [2]	15.02%	15.37%
June 30, 1980 [2]	7.80%	N/A	June 30, 2000 [2]	14.80%	15.58%
June 30, 1981 [2]	11.50%	N/A	June 30, 2001 [2]	(3.96%)	11.02%
June 30, 1982 [2]	0.30%	N/A	June 30, 2002	(8.80%)	5.25%
June 30, 1983 [2]	44.20%	N/A	June 30, 2003 [2]	4.15%	2.80%
June 30, 1984 [2]	(7.70%)	N/A	June 30, 2004 [2]	21.68%	6.09%
June 30, 1985 [2]	24.80%	N/A	June 30, 2005	13.40%	3.63%
June 30, 1986 [2]	26.70%	N/A	June 30, 2006	11.20%	8.93%
June 30, 1987 [2]	14.80%	N/A	June 30, 2007	17.80%	13.93%
June 30, 1988 [2]	(0.80%)	N/A	June 30, 2008	0.24%	12.47%
June 30, 1989 [2]	12.80%	N/A	June 30, 2009	(18.55%)	4.15%
June 30, 1990 [2]	13.80%	N/A	June 30, 2010	13.47%	4.43%
June 30, 1991 [2]	1.89%	N/A	June 30, 2011	20.99%	7.16%
June 30, 1992 [2]	11.19%	N/A	June 30, 2012	2.83%	6.32%
June 30, 1993 [2]	14.74%	N/A	June 30, 2013	7.88%	6.58%
June 30, 1994 [2]	2.61%	N/A	June 30, 2014	17.27%	8.53%
June 30, 1995 [2]	12.12%	N/A	June 30, 2015	0.82%	6.65%
			June 30, 2016	(3.19%)	4.43%
			Average Return - last 5 years	4.89%	6.49%
			Average Return - last 10 years	5.30%	7.42%
			Average Return - since 1976	8.93%	

[1] Dollar-weighted return.
[2] Gross return.

Historical Solvency Test ($000)

	Aggregated Accrued Liabilities for				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, 1995	$ 91,687	$ 764,518	$ 343,543	$ 1,168,056	100.0%	100.0%	91%
July 1, 1996	95,615	812,498	350,104	1,329,570	100.0%	100.0%	100%
July 1, 1998	99,298	1,017,723	432,320	1,518,081	100.0%	100.0%	93%
July 1, 1999	107,008	1,157,882	508,939	1,746,312	100.0%	100.0%	95%
July 1, 2000	111,099	1,324,079	531,225	2,013,491	100.0%	100.0%	100%
July 1, 2001	138,248	707,152	1,461,027	2,226,307	100.0%	100.0%	95%
July 1, 2002	145,255	718,779	1,729,696	2,337,157	100.0%	100.0%	85%
July 1, 2003	153,634	838,090	1,883,014	2,394,411	100.0%	100.0%	74%
July 1, 2004	153,088	995,841	2,190,295	2,466,070	100.0%	100.0%	60%
July 1, 2005	249,804	1,259,243	1,883,927	2,508,794	100.0%	100.0%	53%
July 1, 2006	262,514	1,421,330	1,949,301	2,681,375	100.0%	100.0%	51%
July 1, 2007	275,990	1,575,900	2,005,790	3,004,927	100.0%	100.0%	57%
July 1, 2008	294,678	1,726,121	2,058,165	3,337,612	100.0%	100.0%	64%
July 1, 2009	312,489	1,872,226	2,183,786	3,430,946	100.0%	100.0%	57%
July 1, 2010	149,252	1,998,683	2,084,797	3,526,703	100.0%	100.0%	66%
July 1, 2011	160,828	2,146,222	2,181,093	3,718,052	100.0%	100.0%	65%
July 1, 2012	167,739	2,320,239	2,259,195	3,888,504	100.0%	100.0%	62%
July 1, 2013	163,660	2,501,745	2,344,556	4,070,951	100.0%	100.0%	60%
July 1, 2014	162,982	2,834,747	2,366,263	4,342,936	100.0%	100.0%	57%
July 1, 2015	157,344	3,131,654	2,417,132	4,550,620	100.0%	100.0%	52%
July 1, 2016	151,259	3,420,083	2,441,707	4,662,115	100.0%	100.0%	45%

Note: Dollar amounts in $000

[1] Column (3) included AAL for DROP participants until 2000, now in Column (4)

Schedule of Funding Progress ($000)

Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
July 1, 1995	$ 1,168,056	$ 1,199,748	$ 31,692	97.4%	$ 182,251	17.4%
July 1, 1996	1,329,570	1,258,217	(71,353)	105.7%	187,134	(38.1%)
July 1, 1998	1,518,081	1,549,341	31,260	98.0%	196,364	15.9%
July 1, 1999 *	1,746,312	1,773,829	27,517	98.4%	246,569	11.2%
July 1, 2000	2,013,491	1,966,404	(47,087)	102.4%	250,691	(18.8%)
July 1, 2001	2,226,307	2,306,427	80,120	96.5%	264,226	30.3%
July 1, 2002	2,337,157	2,593,730	256,573	90.1%	286,150	89.7%
July 1, 2003	2,394,411	2,874,738	480,327	83.3%	300,405	159.9%
July 1, 2004	2,466,070	3,339,224	873,154	73.9%	329,840	264.7%
July 1, 2005	2,508,794	3,392,974	884,180	73.9%	321,057	275.4%
July 1, 2006	2,681,375	3,633,145	951,770	73.8%	327,080	291.0%
July 1, 2007	3,004,927	3,857,680	852,753	77.9%	336,029	253.8%
July 1, 2008	3,337,612	4,078,963	741,351	81.8%	351,525	210.9%
July 1, 2009	3,430,946	4,368,501	937,556	78.5%	366,924	255.5%
July 1, 2010**	3,526,703	4,232,732	706,029	83.3%	377,779	186.9%
July 1, 2011	3,718,052	4,488,142	770,090	82.8%	388,409	198.3%
July 1, 2012	3,888,504	4,747,173	858,669	81.9%	389,884	220.2%
July 1, 2013	4,070,951	5,009,961	939,010	81.3%	391,957	239.6%
July 1, 2014	4,342,936	5,363,992	1,021,056	81.0%	399,447	255.6%
July 1, 2015	4,550,620	5,706,130	1,155,510	79.7%	406,233	284.4%
July 1, 2016	4,662,115	6,013,049	1,350,934	77.5%	418,252	323.0%

* Definition of covered payroll changed from base pay to total direct pay less overtime
** Change to Projected Unit Credit cost method. Prior results were provided based on Entry Age Normal.

Historical City Contribution Rates

Valuation Date	Calculated Contribution Rate	Time Period for Contribution Rate	Actual Contribution Rate
(1)	(2)	(3)	(4)
July 1, 1990	14.20%	July 1, 1991 through June 30, 1993	14.3%
July 1, 1992	19.00	July 1, 1993 through June 30, 1994	19.0
July 1, 1993	18.00	July 1, 1994 through June 30, 1995	18.0
July 1, 1994	18.00	July 1, 1995 through June 30, 1996	18.0
July 1, 1995	17.40	July 1, 1996 through June 30, 1997	16.2
July 1, 1996	16.20	July 1, 1997 through June 30, 1998	16.2
July 1, 1997	16.80	July 1, 1998 through June 30, 1999	15.2
July 1, 1998	16.20	July 1, 1999 through June 30, 2000	12.4
July 1, 1999	16.30	July 1, 2000 through June 30, 2001	12.2
July 1, 2000	11.30	July 1, 2001 through June 30, 2002	12.4
July 1, 2001	20.50	July 1, 2002 through June 30, 2003	12.1
July 1, 2002	24.40	July 1, 2003 through June 30, 2004	12.2
July 1, 2003	28.50	July 1, 2004 through June 30, 2005	11.3
July 1, 2004	31.20	July 1, 2005 through June 30, 2006	16.5
July 1, 2005	34.00	July 1, 2006 through June 30, 2007	17.7
July 1, 2006	34.00	July 1, 2007 through June 30, 2008	18.7
July 1, 2007	32.10	July 1, 2008 through June 30, 2009	19.3
July 1, 2008	30.91	July 1, 2009 through June 30, 2010	19.9
July 1, 2009	31.73	July 1, 2010 through June 30, 2011	20.7
July 1, 2010	32.04	July 1, 2011 through June 30, 2012	21.4
July 1, 2011	32.68	July 1, 2012 through June 30, 2013	24.0
July 1, 2012	34.50	July 1, 2013 through June 30, 2014	26.4
July 1, 2013	36.01	July 1, 2014 through June 30, 2015	28.8
July 1, 2014	38.18	July 1, 2015 through June 30, 2016	33.8
July 1, 2015	39.59	July 1, 2016 through June 30, 2017	N/A
July 1, 2016	41.74	July 1, 2017 through June 30, 2018	N/A

Historical Active Participant Data

Valuation Date	Active Count	Average Age	Average Svc	Covered Payroll	Average Salary	Percent Changes
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1990	4,073	36.2	N/A	$126,665[(1)]	$31,099	4.0%
1992	4,120	36.8	N/A	$143,020	$34,714	11.6%
1993	4,498	36.7	N/A	$159,321	$35,420	2.0%
1994	4,705	36.8	N/A	$162,143	$34,462	-2.7%
1995	4,921	36.9	N/A	$174,761	$35,513	3.0%
1996[(2)]	4,395	35.1	N/A	$150,903	$34,335	-3.3%
1997	4,282	35.5	N/A	$149,631	$34,944	1.8%
1998	4,247	35.9	N/A	$153,479	$36,138	3.4%
1999	4,253	36.3	N/A	$187,967[(3)]	$44,196[(3)]	22.3%[(3)]
2000	4,137	36.7	N/A	$179,415	$43,368	-1.9%
2001[(4)]	5,325	40.2	N/A	$264,226[(5)]	$49,620[(5)]	14.4%[(5)]
2002	5,352	40.7	N/A	$286,150	$53,466	7.8%
2003	5,387	41.3	N/A	$300,405	$55,765	4.3%
2004	5,225	41.7	N/A	$329,840	$63,127	13.2%
2005	4,867	42.0	N/A	$321,057[(6)]	$65,966[(6)]	4.5%[(6)]
2006	4,785	42.3	N/A	$327,080	$68,355	3.6%
2007	4,879	42.1	N/A	$336,029	$68,873	0.8%
2008	5,065	42.0	15.7	$351,525	$69,403	0.8%
2009	5,245	41.8	15.4	$366,924	$69,957	0.8%
2010	5,347	41.9	15.3	$377,779	$70,652	1.0%
2011	5,312	42.3	15.7	$388,409	$73,119	3.5%
2012	5,326	42.5	15.7	$389,884	$73,204	0.1%
2013	5,364	42.6	15.7	$391,957	$73,072	-0.2%
2014	5,343	42.6	15.7	$399,447	$74,761	2.3%
2015	5,261	42.8	15.9	$406,233	$77,216	3.3%
2016	5,261	42.6	15.7	$418,252	$79,500	3.0%

(1) Reflects the November 1, 1990 pay increase.
(2) For the July 1, 1996 to July 1, 2000 valuations, includes those participants currently accruing benefits (i.e. excludes current DROP participants).
(3) Definition of covered payroll changed from base pay to total direct pay less overtime.
(4) Beginning July 1, 2001, includes active participants eligible for DROP.
(5) Beginning July 1, 2001, the definition of total direct pay changed from the average of the last 26 pay periods to the highest bi-weekly pay period.
(6) Beginning October 9, 2004, pensionable pay is the total of the last 26 pay periods, excluding CMEPP and SOSP.

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

	Added to Rolls		Removed from Rolls		Rolls-End of Year			
Valuation July 1,	Number	Annual Allowances	Number	Annual Allowances	Number	Annual Allowances	% Increase in Annual Allowances	Average Annual Allowances
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1995	893	$ 19,109	36	$ 602	2,335	$ 48,624	65.0%	$ 20,824
1996 *	182	3,481	29	618	2,488	52,772	8.5%	21,211
1998	159	3,483	28	589	2,619	63,957	21.2%	24,420
1999	150	3,770	46	1,001	2,723	70,432	10.1%	25,866
2000	233	6,421	36	857	2,920	76,401	8.5%	26,165
2001 **	131	3,755	1,250	33,892	1,801	54,006	(29.3%)	29,987
2002	104	2,809	46	1,113	1,859	55,013	1.9%	29,593
2003	106	2,967	47	1,109	1,918	61,531	11.8%	32,081
2004	220	9,172	33	1,014	2,105	70,307	14.3%	33,400
2005	353	15,962	55	1,776	2,403	86,933	23.6%	36,177
2006	254	10,195	66	2,197	2,549	96,812	11.4%	37,980
2007	175	8,056	49	1,809	2,717	105,481	9.0%	38,823
2008	149	11,889	57	1,995	2,809	115,375	9.4%	41,073
2009	154	9,639	63	2,275	2,900	122,738	6.4%	42,324
2010	165	8,891	56	2,355	3,009	129,274	5.3%	42,963
2011	171	10,567	59	2,218	3,121	137,623	6.5%	44,096
2012	180	11,934	71	2,820	3,230	146,737	6.6%	45,429
2013	183	11,674	64	2,345	3,349	156,066	6.4%	46,601
2014	217	13,857	63	2,627	3,503	167,296	7.2%	47,758
2015	288	16,132	65	2,762	3,726	180,666	8.0%	48,488
2016	259	16,357	77	3,291	3,908	193,733	7.2%	49,573

* From June 30, 1996 through June 30, 2001 includes DROP participants.
** Beginning July 1, 2001 excludes active participants eligible for DROP.

Note: Dollar amounts in $000

Membership Data

	July 1, 2016	July 1, 2015	July 1, 2014
	(1)	(2)	(3)
1. Active members			
a. Number	5,261	5,261	5,343
b. Number in DROP	2,057	1,991	1,920
c. Total payroll	$ 418,251,694	$ 406,232,842	$ 399,446,734
Payroll in DROP	$ 191,140,953	$ 178,870,056	$167,464,715
d. Average salary	79,500	77,216	74,761
e. Average age	42.6	42.8	42.6
f. Average service	15.7	15.9	15.7
2. Inactive participants			
a. Vested	32	28	28
b. Total annual benefits (deferred)	$ 785,324	$ 780,588	$ 741,618
c. Average annual benefit	24,541	27,878	26,486
3. Service retirees			
a. Number	3,002	2,873	2,737
b. Total annual benefits	$ 155,529,585	$ 145,247,137	$ 134,837,893
c. Average annual benefit	51,809	50,556	49,265
d. Average age	64.8	64.6	64.4
4. Disabled retirees			
a. Number	161	154	148
b. Total annual benefits	$ 7,221,166	$ 6,904,802	$ 6,420,044
c. Average annual benefit	44,852	44,836	43,379
d. Average age	56.0	55.5	54.9
5. Beneficiaries and spouses			
a. Number	713	671	590
b. Total annual benefits	$ 30,196,684	$ 27,733,955	$ 25,296,561
c. Average annual benefit	42,352	41,332	42,876
d. Average age	69.0	68.9	69.3

Distribution of Active Members by Age and by Years of Service

Active Members Sworn Prior to October 9, 2004

Attained Age	0-4 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									
30-34									
35-39			128	38					166
			87,321	91,753					88,335
40-44			122	248					370
			86,296	91,202					89,584
45-49			59	233	3				295
			83,609	90,230	91,606				88,920
50-54			8	69	2	1			80
			86,661	87,975	86,235	84,687			87,759
55-59			2	7			1		10
			91,193	89,499			75,284		88,416
60-64				1					1
				88,940					88,940
65 & Over									
Total			319	596	5	1	1		922
			$ 86,250	$ 90,460	$ 89,457	$ 84,687	75,284		$ 88,975

Average:

Age	43.8
Service	16.3
Salary	$88,975

Distribution of Active Members by Age and by Years of Service

Active Members Sworn Post October 9, 2004

Attained Age	0-4 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								107
	45,892								45,891
25-29	481	44							525
	54,036	66,028							55,041
30-34	244	516	18						778
	55,311	69,822	82,159						65,557
35-39	81	337	51						469
	56,057	70,516	77,441						68,772
40-44	40	157	34	1					232
	55,540	70,947	78,126	85,192					69,404
45-49	21	104	22						147
	57,912	69,527	77,150						69,008
50-54		19	3	1					23
		69,971	84,292	110,948					73,620
55-59			1						1
			72,389						72,389
60-64									
65 & Over									
Total	974	1,177	129	2					2,282
	$ 53,774	$ 70,005	78,350	98,070					$ 63,574

Average:

Age	33.6
Service	5.6
Salary	$63,574

Distribution of Active Members by Age and by Years of Service

DROP Members

Attained Age	0-4 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									
30-34									
35-39									
40-44					82 94,984				82 94,984
45-49					604 93,422	48 95,815			652 93,599
50-54					327 91,921	150 92,396	202 92,558		679 92,216
55-59					80 89,602	56 88,260	282 92,647	53 97,797	471 92,187
60-64					10 90,578	16 87,865	54 93,681	58 97,866	138 94,541
65 & Over					1 78,129		15 89,177	19 96,250	35 92,701
Total					1,104 $ 92,777	270 $ 91,878	553 $ 92,621	130 $ 97,602	2,057 $ 92,922

Average:

Age	52.1
Service	26.5
Salary	$92,922

Distribution of Active Members by Age and by Years of Service

Total Active and DROP Members

Attained Age	0-4 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								107
	$ 45,892								$ 45,891
25-29	481	44							525
	$ 54,036	$ 66,028							$ 55,041
30-34	244	516	18						778
	$ 55,311	$ 69,822	$ 82,159						$ 65,557
35-39	81	337	179	38					635
	$ 56,057	$ 70,516	$ 84,506	$ 91,753					$ 73,886
40-44	40	157	156	249	82				684
	$ 55,540	$ 70,947	$ 84,515	$ 91,178	$ 94,984				$ 83,386
45-49	21	104	81	233	607	48			1,094
	$ 57,912	$ 69,527	$ 81,854	$ 90,230	$ 93,413	$ 95,815			$ 89,033
50-54		19	11	70	329	151	202		782
		69,971	$ 86,015	$ 88,303	$ 91,887	$ 92,345	$ 92,558		$ 91,213
55-59			3	7	80	56	283	53	482
			$ 84,925	$ 89,499	$ 89,602	$ 88,260	$ 92,585	$ 97,797	$ 92,068
60-64				1	10	16	54	58	139
				$ 88,940	$ 90,578	$ 87,865	$ 93,681	$ 97,866	$ 94,501
65 & Over					1		15	19	35
					78,129		$ 89,177	$ 96,250	$ 92,701
Total	974	1,177	448	598	1,109	271	554	130	5,261
	$ 53,774	$ 70,005	$ 83,975	$ 90,485	$ 92,762	$ 91,851	$ 92,590	$ 97,602	$ 79,500

Average:

Age	42.6
Service	15.7
Salary	$79,500

APPENDIX A

SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

Summary of Actuarial Assumptions and Methods

The following methods and assumptions were used in preparing the July 1, 2016 actuarial valuation report.

1. <u>Valuation Date</u>

   The valuation date is as of July 1st, the first day 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. <u>Actuarial Cost Method</u>

   The actuarial valuation uses the Projected Unit Credit (PUC) 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 accrued liability (UAAL).

   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 (currently 8.00%), of each participant's expected benefit payable at retirement or death is determined, based on his/her age, service, gender 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 for 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 System on account of the present group of participants and beneficiaries.

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

   c. The normal cost is the present value of the portion of projected benefits that is attributable to service accrued in the current year. Under the PUC cost method, if actual plan experience is close to assumptions, the normal cost will increase each year for each employee as he or she approaches retirement age. However, if the age/service/gender characteristics of the active group remain relatively constant, the total normal cost can be expected to remain somewhat level as a percentage of payroll.

d. The accrued liability is the portion of the present value of projected benefits attributable to service credited prior to the valuation date. The unfunded actuarial 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, but the determination of the rate does not reflect 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. <u>Actuarial Value of Assets</u>

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) over 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 bases 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 2.75% inflation rate and a 5.25% net real rate of return. This rate represents the assumed return, net of all investment expenses.

b. Cost of Living Adjustment (COLA): Monthly benefits for participants receiving payments are increased each April 1 by 80% of the increase in the Consumer Price Index for All Urban Consumers (CPI-U) for the preceding year, with a minimum of 2.40% and a maximum of 8.00%. For this valuation, the annual COLA is assumed to be 2.70%.

c. Salary increase rate: A service-related component, plus a 2.00% inflation and productivity component, as follows:

Years of Service	Service-related Component	Total Annual Rate of Increase Including 2.00% Inflation & Productivity Component
(1)	(2)	(3)
1	12.00%	14.00%
2	9.00%	11.00%
3	7.25%	9.25%
4	6.00%	8.00%
5	5.50%	7.50%
6	5.00%	7.00%
7	4.25%	6.25%
8	4.00%	6.00%
9	3.50%	5.50%
10	3.25%	5.25%
11	3.00%	5.00%
12	2.75%	4.75%
13	2.50%	4.50%
14	2.25%	4.25%
15	2.00%	4.00%
16	1.75%	3.75%
17	1.50%	3.50%
18 and Over	0.00%	2.00%

d. Payroll growth rate: In the amortization of the unfunded actuarial accrued liability, payroll is assumed to increase 2.75% 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

	Service		
Age	<25	25 - 29	30+
40-49	4.0%	6.0%	10.0%
50-54	4.0%	6.0%	10.0%
55-59	6.8%	10.2%	17.0%
60-64	9.6%	14.4%	24.0%
65 +	100.0%	100.0%	100.0%

For members hired after October 9, 2004, 30% is added to the retirement rate at age 55.

b. DROP Participation

100% of eligible active participants are assumed to elect the DROP.

c. DROP Entry Date

Active members (not already in DROP) are assumed to take advantage of the DROP and enter when first eligible. Participants are assumed to elect the maximum duration for the back DROP, up to 20 years.

d. DROP Interest Credit

A minimum of 3.00% interest will be credited to existing DROP accounts with a maximum of 7.00%. If the System's actuary certifies that past service costs are fully funded, the credit may be as high as 10.00%. For this actuarial valuation, the drop interest credit is assumed to be 6.40%.

e. Withdrawal of DROP and PROP Balances

Members are assumed to withdraw balances in equal annual installments over 10 years.

f. Mortality rates (for active and retired members)

- Healthy retirees - The Gender-distinct RP-2000 Combined Healthy Mortality Tables with Blue Collar Adjustment are used with male rates multiplied by 109% and female rates multiplied by 103%. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements.

- Disabled males and females – The gender-distinct RP-2000 Disabled Retiree Mortality Tables are used without adjustment. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements.

- Active members - The Gender-distinct RP-2000 Combined Healthy Mortality Tables with Blue Collar Adjustment are used with male rates multiplied by 54% and female rates multiplied by 51%. The rates are projected on a fully generational basis by scale BB to account for future mortality improvements. An additive factor of .0003 is applied to all active mortality rates. All active deaths are assumed to be duty-related.

Sample rates are shown below for 2016:

Age	Healthy Retired Males	Healthy Retired Females	Disabled Males	Disabled Females	Healthy Active Males	Healthy Active Females
(1)	(2)	(3)	(4)	(5)	(6)	(7)
25	0.04%	0.02%	2.15%	0.71%	0.05%	0.04%
30	0.08%	0.03%	2.15%	0.71%	0.07%	0.04%
35	0.11%	0.05%	2.15%	0.71%	0.09%	0.06%
40	0.14%	0.09%	2.15%	0.71%	0.10%	0.07%
45	0.19%	0.14%	2.15%	0.71%	0.12%	0.10%
50	0.25%	0.19%	2.76%	1.10%	0.15%	0.13%
55	0.44%	0.27%	3.38%	1.53%	0.25%	0.16%
60	0.81%	0.43%	3.76%	1.86%	0.43%	0.24%
65	1.40%	0.88%	4.14%	2.31%	0.72%	0.47%
70	2.29%	1.58%	4.91%	3.10%	1.16%	0.81%
75	3.69%	2.62%	6.44%	4.31%	1.86%	1.33%
80	6.04%	4.16%	8.59%	5.96%	3.02%	2.09%

g. Termination Rates and Disability Rates

Termination rates (for causes other than death, disability or retirement) are a function of the member's service and are not applied after a member becomes eligible for a retirement benefit. Disability rates are age-based and not applied for members in the DROP or those members eligible to back DROP. All disabilities are assumed to be duty-related. Rates at selected ages and service levels are shown below.

Service Based Rates of Termination		
Service	Male	Female
1	2.71%	2.71%
3	1.95%	1.95%
5	1.40%	1.40%
7	1.01%	1.01%
9	0.72%	0.72%
11	0.52%	0.52%
13	0.37%	0.37%
15	0.27%	0.27%
17	0.19%	0.19%
19	0.14%	0.14%
20 +	0.10%	0.10%

Age Based Rates of Disability		
Age	Male	Female
20	0.1149%	0.1149%
25	0.1145%	0.1145%
30	0.1197%	0.1197%
35	0.1321%	0.1321%
40	0.1516%	0.1516%
45	0.1785%	0.1785%
50	0.2126%	0.2126%
55	0.2538%	0.2538%
60	0.3023%	0.3023%

6. Other Assumptions

a. Percent married: 90% of employees are assumed to be married. (No beneficiaries other than the spouse assumed.)

b. 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.

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

d. Percent electing deferred termination benefit: 50% of vested terminating members are assumed to elect a refund rather than take a deferred benefit at age 60.

e. There will be no recoveries once disabled.

f. No surviving spouse will remarry.

g. 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.

h. Administrative expenses: Administrative expenses are accounted for as an explicit component on the normal cost rate.

i. 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.

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

k. 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.

l. Decrement relativity: Decrement rates are converted to probabilities in order to account for multiple decrements.

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

n. Benefit Service: All members are assumed to accrue one year of service each year**.** Exact fractional service is used to determine the amount of benefit payable.

7. Participant Data

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

The data for active members included birth date, gender, 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, gender, 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 annuities, prorated by the 90% marriage assumption and reflecting the three year spousal age differential described above. All beneficiaries are assumed to have life annuity only benefits.

Salary supplied for the current year was based on the earnings for the year preceding the valuation date. This salary was adjusted by the salary increase rate for one year.

In fiscal years when a 27^{th} pay period occurs the individual pays for employees who were employed throughout the year will be adjusted by multiplying their reported pay by the ratio of 26/27. In years that have only 26 pay periods no adjustment would be needed.

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

APPENDIX B

SUMMARY OF PLAN PROVISIONS

Summary of Plan Provisions

Covered Members	All police officers sworn before September 1, 1975 are covered under Plan 1, except those who elected by December 31, 1981 to participate in Plan 3. All police officers sworn on or after September 1, 1975, but before September 1, 1981 are covered under Plan 2, except those who elected by December 31, 1981 to participate in Plan 3 and those Plan 1. All other police officers are covered by Plan 3, except those from Police Cadet Classes 70 and 71 who elected to pay additional contributions and transfer to Plan 1.
Final Compensation	
Prior to November 28, 1998	Monthly base salary paid to the participant in his/her last month of service. For any participant from a position held for less than 3 years, final compensation is the average monthly base salary for the 3 years prior to retirement.
After November 28, 1998 but prior to July 1, 2001	Monthly total direct pay less overtime paid to the participant in his/her last month of service. For any participant from a position held for less than 3 years, final compensation is the average monthly base pay for the 3 years prior to retirement plus the other current components of total direct pay.
After July 1, 2001 but prior to October 9, 2004	Highest biweekly pay period (excluding overtime) during the last 26 pay periods annualized. Amounts not paid on a biweekly basis are deducted from period paid. Annual amounts are divided by 26 and added to the highest pay period, including motorcycle allowances.
After October 9, 2004	Average of the last three years of compensation (excluding exempt time, overtime and strategic officer staffing pay). This average will be phased in beginning with the pay period ending after October 9, 2004 until the new definition is fully phased in after 78 pay periods.
Service Retirement	
Eligibility	
‣ Sworn prior to October 9, 2004	20 years of service.
‣ Sworn on or after October 9, 2004	Age 55 with 10 years of service.

Benefit

▸ Prior to November 1, 1955	\$75 per month plus \$2 per month for each year of service in excess of 25 years.
▸ After November 1, 1955 but prior to January 13, 1968	30% of final compensation plus 1 % of final compensation for each year of service in excess of 20 years.
▸ After January 13, 1968 but prior to July 1, 1986	Plans 1 and 2: 30% of final compensation plus 2% of final compensation for each year of service in excess of 20 years. Plan 3: 2% of final compensation for each year of service up to 40 years, reduced 0.42% for each month benefit commencement precedes age 55.
▸ After July 1, 1986 but prior to July 1, 1988	2% of final compensation for each year of service up to 40 years.
▸ After July 1, 1988 but prior to September 1, 1997	45% of final compensation plus 2% of final compensation for each year of service in excess of 20 years; maximum 80% of final compensation. Benefit based on prior formula is payable until July 1, 1991 and recomputed benefit is payable thereafter.
▸ After September 1, 1997 but prior to July 1, 2001	50% of final compensation plus 2% of final compensation for each year of service in excess of 20 years; maximum 80% of final compensation.
▸ After July 1, 2001 but prior to October 9, 2004	55% of final compensation plus 2% of final compensation for service in excess of 20 years. The Pension System recomputed the benefit of each person who retired before July 1, 2001. The retiree's benefit was increased by the result of multiplying the difference between 55% and the percentage used at the time of retirement in computing the retiree's benefit for the first 20 years of service by the base salary of the retiree at the time of retirement. Retroactive cost-of-living increases were not applied to the increased benefit. This recomputed benefit is effective for all payments on or after July 1, 2001.

‣ After October 9, 2004	Participants sworn prior to October 9, 2004 will receive the highest of the following alternatives using Final Average Compensation effective after October 9, 2004, from October 9, 2004 through October 7, 2007: 1) 2.75% of Final Average Compensation for each of the first 20 years of service plus 2% of Final Average Compensation for each year of service in excess of 20 years, with a maximum of 80% of Final Average Compensation. 2) Benefit participant would have received had participant retired or entered the DROP immediately before October 9, 2004 3) Benefit calculated using a sliding average of the pay received for the pay periods elapsed since October 9, 2004. New participants after October 9, 2004: 2.25% of Final Average Compensation for each of the first 20 years of service plus 2% of Final Average Compensation for each year of service in excess of 20 years, with a maximum of 80% of Final Average Compensation.
Additional Benefits	An extra monthly benefit of $150.00 is payable for life. Effective November 28, 1998, a $5,000 lump sum is payable upon retirement for members sworn prior to October 9, 2004.

Terminated Vested Pension Benefit

Eligibility	Sworn in before October 9, 2004 and more than 10 but less than 20 years of service. Termination on or after November 28, 1998.
Benefit	2.75% of final average compensation times years of service. This benefit commences at age 60 or at termination of service if later.

Deferred Retirement Option Plan (DROP)

Eligibility	20 years of service and sworn in prior to October 9, 2004.
Benefit	
‣ After September 1, 1995 but prior to September 1, 1997	Eligible participants may elect to participate in the DROP until they leave active service. The member's retirement pension will be calculated based on service and earnings at the time the DROP is elected.

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

– The member's monthly retirement pension, including applicable cost-of-living adjustments,
– The member's contribution to the Pension System, limited to 8.75% of pay, and
– Investment earnings/losses at the rate of the Pension System's earnings/losses averaged over a five-year period. Effective July 1, 2001, this rate is subject to a minimum of 0%.

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

If a DROP participant suffers an on-duty disability resulting in the inability to perform his/her usual and customary duties as a police officer or dies in the line of duty, he (or his survivors) are allowed to revoke the DROP election and to receive the more generous on-duty disability or death benefits.

- After September 1, 1997 but prior to December 1, 1998: The Pension System recomputed the benefit of each person who entered the DROP before September 1, 1997. The benefit was increased in the same manner as the retiree's benefit.
- After December 1, 1998 but prior to July 1, 2001: The Pension System recomputed the benefit of each person who entered the DROP before December 1, 1998. The benefit was recalculated based on Total Direct Pay less overtime upon entry to the DROP. This recomputed benefit is effective for all payments on or after December 1, 1998.
- After July 1, 2001 but prior to October 9, 2004: The Pension System recomputed the benefit of each person who entered the DROP before July 1, 2001. The member's benefit was increased by the result of multiplying the difference between 55% and the percentage used at the time of DROP entry in computing the member's benefit for the first 20 years of service by the base salary of the member at the time of DROP entry. Retroactive cost-of-living increases were applied to the increased benefit. The account balance for each participant was recomputed as if this new benefit had been effective since DROP entry.
- After October 9, 2004: A minimum of 3.00% interest will be credited to existing DROP accounts with a maximum of 7.00%. If the actuary certifies that past service costs are fully funded, the credit may be as high as 10.00%.

Benefit Recalculation	Effective July 1, 2001, monthly benefit at retirement will be recalculated to be the greater of (i) current monthly benefit, or (ii) monthly benefit based on service at DROP entry and Final Compensation at retirement date.
Back DROP Option	Effective on July 1, 2001, a back DROP option is available for all eligible participants. The DROP account is recalculated under the option based on what the account balance would have been had the participant elected the DROP earlier than he/she actually did. The initial DROP entry date cannot be backdated prior to September 1, 1995 or prior to 20 years of credited service, and must be on the first of the month selected.

Postretirement Option Plan (PROP)

Eligibility	Retired from DROP and sworn in prior to October 9, 2004.
Benefit	
‣ After November 28, 1998 but prior to July 1, 2001	A retired member is allowed to leave all or a portion of their DROP account in the System. These accounts are credited every calendar year with the 30-year Treasury bond rate as of June of the preceding year.
‣ After July 1, 2001	The interest rate earned on PROP accounts will be the same as the interest rate credited to DROP accounts, including a minimum credited rate of 0%.

Partial Lump Sum Optional Payment (PLOP)

Eligibility	Participant on or after October 9, 2004.
Benefit	
‣ After October 9, 2004	Up to 20% of the actuarial value of the accrued pension at retirement.

Disability Retirement

Eligibility	Effective July 1, 2001, a disabled participant is eligible for Disability Retirement as defined below: – Disability is defined as “unable to perform his/her usual and customary duties as a police officer”.

Benefit

- Duty-connected

The service retirement benefit accrued to date of disability. . For participants before October 9, 2004, the disability benefit is 2.75% of final average pay times years of service with a minimum of 55% of final average pay. For participants after October 9, 2004, the disability benefit is 2.25% of final average pay times years of service with a minimum of 45% of final average pay.

Additional Benefits

For participants before October 9, 2004, an education allowance equal to 100% of final compensation less disability benefit is payable for up to four years for off-duty or duty-related disability. Proportionate members injured while on-duty as a municipal worker will receive immediate off-duty benefit upon Board approval.

Survivor Benefits

Eligibility

Surviving spouses and dependent children and parents of participants, including surviving spouses of retired or disabled participants who were not married at the time of retirement or disability, provided the spouse was married to the participant for at least 5 years at the time of death.

Benefit

- Prior to September 1, 1997

If duty-connected: monthly lifetime benefit equal to 100% of final compensation at date of death.

If not duty-connected: monthly lifetime benefit equal to 100% of the service retirement benefit the participant had accrued at the time of death.

Spouse's benefit upon death after retirement: monthly lifetime benefit equal to actual benefit payable at time of death.

Dependent children's benefit if no surviving spouse: the benefit that would have been payable to the spouse is divided equally among the dependent children.

If there is a surviving spouse, the dependent children of Plan 1 and Plan 2 participants receive $25 per month. Dependent children include unmarried children who are under age 18, and for Plan 3, full-time students under age 22, or permanently disabled children.

Dependent parent's income if no surviving spouse or children, but there is a dependent parent: the benefit that would have been payable to the spouse will be paid to the dependent parent.

- After September 1, 1997 but prior to July 1, 2001

The Pension System recomputed the benefit of each survivor whose original benefit was computed prior to September 1, 1997. The benefit was increased in the same manner as the retiree's benefit.

- After July 1, 2001

The Pension System recomputed the benefit of each survivor whose original benefit was computed prior to July 1, 2001. The benefit was increased in the same manner as the retiree's benefit.

Additional Benefits

Effective December 1, 1998, a $5,000 lump sum is paid upon the death of an active member who was sworn in prior to October 9, 2004.

Effective July 1, 2001, an extra monthly benefit of $150.00 is payable for life. Children receiving equivalent of the spouse's benefit do not receive this additional benefit.

Benefit Adjustments

Cost-of-Living

- Prior to October 9, 2004

Monthly benefits for participants receiving payments are increased each April 1 by 2/3 of the increase in the Consumer Price Index for All Urban Consumers (CPI-U) for the preceding calendar year. Effective September 1, 1997 this increase is subject to a minimum of 3.0% per year compounded and a maximum increase of 8.0% per year compounded.

- After October 9, 2004

Monthly benefits for participants receiving payments are increased each April 1 by 80% of the increase in the Consumer Price Index for All Urban Consumers (CPI-U) for the preceding year, with a minimum of 2.4% and a maximum of 8%.

13th Benefit Check

Effective November 28, 1998, a 13th benefit check is paid to current retirees and DROP members when:

– The assets on the fund equal or exceed the liabilities after the 13th benefit check is paid.

– The return on investments for the preceding fiscal year exceeds 9.25%.

– The payment of the benefit will not cause the City of Houston's contribution to the System to increase.

– Effective October 9, 2004, the funded ratio of the plan must be at least 120% for the 13th check to be paid out.

Service Adjustments	Effective November 28, 1998, participants with previous service with the City in non-classified positions may use that service to satisfy the service requirement of 20 years for retirement purposes only. Effective July 1, 2001, participants who have service credit in more than one City of Houston Pension Plan may use their combined service to qualify for DROP participation. Effective July 1, 2001, participants involuntarily transferred to the System from the Houston Municipal Employees System will receive service under this plan for years worked while serving as a City Marshall, Airport Police or Park Police.

Contributions

Employee Contributions	
‣ Prior to December 1, 1998	Each participant contributes 8.75% of base salary.
‣ After December 1, 1998 but before October 9, 2004	Each participant contributes 8.75% of average total direct pay less overtime.
‣ After October 9, 2004	
– Members sworn in prior to October 9, 2004	Each participant contributes 9.00% of pay. The additional 0.25% will be credited to the Plan's general fund. 8.75% of pay is used for purposes of crediting eligible DROP accounts.
– Others	Each participant contributes 10.25% of pay, which will be credited to the Plan's general fund.
Refunds	Contributions are refunded without interest.

Employer Contribution — The City of Houston will follow the following contribution schedule:

Fiscal Year Ending (June 30th)	City Contribution Amount
2001	$ 30,645,000
2002	32,645,000
2003	34,645,000
2004	36,645,000
2005	36,645,000
2006	16% of total compensation, with a minimum of $53,000,000
2007-2011	$5,000,000 above the prior year's payment
2012	83,000,000 fixed payment with any shortfall not to exceed 17,000,000*
2013	93,000,000 fixed payment with any shortfall not to exceed 8,500,000*
2014	103,000,000 fixed payment

*These shortfalls were financed at 8.5% interest and paid in FYE 2016.

For all subsequent Fiscal Years, and until the Funded Ratio reaches 100%, City payments shall increase each City Fiscal Year by $10,000,000 until said 100% of funding is reached. Once the Funded Ratio has reached 100%, City payments each City Fiscal Year shall be in amounts equivalent to the greater of 16% of pay, as defined herein, or the ADC. The 2011 Meet & Confer Agreement is to remain in effect until June 30, 2023.

In addition, on the first day of City Fiscal Year 2012, once the Funded Ratio reaches 80%, if it should ever be subsequently determined that the Funded Ratio has declined below such 80%, then in the City Fiscal Year next following such determination, the City shall pay such additional amounts to the Houston Police Officers' Pension System as necessary to increase the Funded Ratio to 80%.

Changes in Plan Provisions from the Prior Valuation

There were no changes to the plan provisions from the prior actuarial valuation.

Glossary

Actuarial Accrued Liability (AAL): That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of Future Plan Benefits which is not provided for by future Normal Costs. It is equal to the Actuarial Present Value of Future Plan Benefits minus the actuarial present value of future Normal Costs.

Actuarial Assumptions: Assumptions as to future experience under the Fund. These include assumptions about the occurrence of future events affecting costs or liabilities, such as:

- mortality, withdrawal, disablement, and retirement;
- future increases in salary;
- future rates of investment earnings and future investment and administrative expenses;
- characteristics of members not specified in the data, such as marital status;
- characteristics of future members;
- future elections made by members; and
- other relevant items.

Actuarial Cost Method or ***Funding Method:*** A procedure for allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability. These items are used to determine the ADC.

Actuarial Gain or ***Actuarial Loss:*** A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., the Fund's assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results that produce actuarial liabilities which are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.

Actuarially Equivalent: Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.

Actuarial Present Value (APV): The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. For purposes of this standard, each such amount or series of amounts is:

a. adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.)
b. multiplied by the probability of the occurrence of an event (such as survival, death, disability, termination of employment, etc.) on which the payment is conditioned, and
c. discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Actuarial Present Value of Future Plan Benefits: The Actuarial Present Value of those benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive, non-retired members either entitled to a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would be provide sufficient assets to pay all projected benefits and expenses when due.

Actuarial Valuation: The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB 25, such as the funded ratio and the ADC.

Actuarial Value of Assets or ***Valuation Assets:*** The value of the Fund’s assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly actuaries use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.

Actuarially Determined: Values which have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.

Amortization Method: A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.

Amortization Payment: That portion of the pension plan contribution or ADC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Annual Determined Contribution (ADC): The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under GASB 25. The ADC consists of the Employer Normal Cost and the Amortization Payment.

Closed Amortization Period: A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Funding Period and Open Amortization Period.

Decrements: Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or termination.

Defined Benefit Plan: A retirement plan that is not a Defined Contribution Plan. Typically a defined benefit plan is one in which benefits are defined by a formula applied to the member's compensation and/or years of service.

Defined Contribution Plan: A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, and the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.

Employer Normal Cost: The portion of the Normal Cost to be paid by the employers. This is equal to the Normal Cost less expected member contributions.

Experience Study: A periodic review and analysis of the actual experience of the Fund which may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.

Funded Ratio: The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Funding Period or ***Amortization Period:*** The term "Funding Period" is used it two ways. In the first sense, it is the period used in calculating the Amortization Payment as a component of the ADC. This funding period is chosen by the Board of Trustees. In the second sense, it is a calculated item: the number of years in the future that will theoretically be required to amortize (i.e., pay off or eliminate) the Unfunded Actuarial Accrued Liability, based on the statutory employer contribution rate, and assuming no future actuarial gains or losses.

GASB: Governmental Accounting Standards Board.

GASB 67 and ***GASB 68***: Governmental Accounting Standards Board Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.

Normal Cost: That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits which are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated. Under the entry age normal cost method, the Normal Cost is intended to be the level cost (when expressed as a percentage of pay) needed to fund the benefits of a member from hire until ultimate termination, death, disability or retirement.

Open Amortization Period: An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.

Unfunded Actuarial Accrued Liability: The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.

Valuation Date or Actuarial Valuation Date: The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.