Gabriel Roeder Smith & Company
Consultants & Actuaries

DENVER EMPLOYEES RETIREMENT PLAN

ACTUARIAL VALUATION REPORT

AS OF JANUARY 1, 2016

Gabriel Roeder Smith & Company

GRS
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May 5, 2016

Board of Trustees
Denver Employees Retirement Plan
777 Pearl St
Denver, CO 80203

Re: Denver Employees Retirement Plan Actuarial Valuation as of January 1, 2016

Dear Board Members:

The results of the January 1, 2016 Annual Actuarial Valuation of the Denver Employees Retirement Plan (DERP) are presented in this report. The purpose of the valuation is to measure the Plan's funding progress and to determine the employer contribution rate for the next fiscal year.

This report was prepared at the request of the DERP Board and is intended to be used by those designated or approved by the Board. This report may be provided to parties other than DERP only in its entirety and only with the permission of DERP.

Effective October 1, 2015, the discount rate and rate of return assumption was changed from 8.00% to 7.75%. Last year's valuation report issued on June 29, 2015, reflected the previous assumption of 8.00%. Subsequent to the release of that report, the liabilities were re-measured based on the new assumption of 7.75%. The results of this re-measurement were disclosed in a letter also dated June 29, 2015. For the purposes of this report, the January 1, 2015, results are shown for both assumptions in the executive summary. Please note that throughout the report, when the prior year results are referenced, they are referring to the results under the new assumption of 7.75%.

Regarding the contribution rate for the next fiscal year (2016), there is a slight decrease in the Total Computed Contribution Rate for the Medical Plan while the Pension Plan Rate increased, as shown on pages 9 and 10 of the valuation report. The Total Computed Contribution Rate (Pension and Medical) has increased from 19.28% for 2015 to 19.55% for 2016. The scheduled contribution rate is 19.50% and is therefore approximately sufficient to cover the Annual Required Contribution for 2016. The Total Computed Contribution Amount (Pension and Medical) has increased from $109.6M for 2015 to $114.7M (a 4.9% increase) for 2016.

The 11.50% employer contribution and the 8.00% employee contribution are the rates that comply with current policy. Users of this report should be aware that contributions made at that rate do not necessarily guarantee benefit security. Additional contributions and/or additional investment earnings above the assumed 7.75% would contribute to enhancing benefit security.

The employer contribution requirement of this report is determined using the actuarial assumptions and methods disclosed in Section F of this report. This report does not include a detailed assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the plan's financial condition.

The valuation was based upon information furnished by DERP concerning Plan benefits, financial transactions, active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not otherwise audit the data. These calculations may be subject to certain provisions of the agreement between the Denver Health and Hospital Authority (DHHA) and DERP. This report and these calculations are not intended as legal or accounting advice, and we would recommend review by legal counsel for the compliance of these calculations with all relevant agreements.

For the retiree medical benefits, the schedules illustrate the value of the explicit benefit as described in the Plan Summary. While the explicit benefit is valued in compliance with all the parameters established by GASB Statements No. 43 and 45, it is not the intention of these schedules to satisfy the requirements of those GASB Statements. The value of any implicit rate subsidy in the City-sponsored health plans will be illustrated in the disclosures related to those plans.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events for the Pension Plan, Retiree Medical Plan, and DHHA. We believe that the assumptions and methods used in this report are reasonable and appropriate for the purpose for which they have been used. However, other assumptions and methods could also be reasonable and could result in materially different results. In addition, because it is not possible or practical to consider every possible contingency, we may use summary information, estimates or simplifications of calculations to facilitate the modeling of future events. We may also exclude factors or data that are deemed to be immaterial.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.

If there is other information that you need in order to make an informed decision regarding the matters discussed in this report, please contact us.

We certify that the information contained in this report is accurate and fairly presents the actuarial position of DERP as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

The actuaries submitting this statement are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. Both are experienced in performing valuations for large public retirement systems.

Respectfully submitted,

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Paul T Wood

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Consultant

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SECTION A

INTRODUCTION

Pension Plan - Executive Summary

($ in Millions)

Valuation Date:	January 1, 2016	January 1, 2015	January 1, 2015
Fiscal Year Ending:	December 31, 2016	December 31, 2015	December 31, 2015
Discount Rate	7.75%	7.75%	8.00%
Actuarial Information:			
· Normal Cost %	9.74%	10.09%	9.71%
· Actuarial Accrued Liability (AAL)	$3,003.59	$2,893.67	$2,823.62
· Unfunded Actuarial Accrued Liability (UAAL)	$834.84	$761.64	$691.59
· Funded Ratio	72.21%	73.68%	75.51%
· UAAL as % of Covered Payroll	142.26%	133.96%	121.64%
· Equivalent Single Amortization Period	27.5 years	28.3 years	28.1 years
Required Contributions:			
· Normal Cost	$57.17	$57.39	$55.20
· Amortization of the Unfunded Liability	$50.50	$45.37	$42.37
· Total Contribution Amount*	$107.67	$102.76	$97.57
· Percentage of Covered Payroll	18.35%	18.07%	17.16%
Assets:			
· Market Value	$1,945.67	$2,055.27	$2,055.27
· Actuarial Value	$2,168.75	$2,132.02	$2,132.02
· Return on Market Value	-1.96%	4.91%	4.91%
· Return on Actuarial Value	5.09%	7.06%	7.06%
· Ratio – Actuarial Value to Market Value	111.47%	103.73%	103.73%
Membership:			
· Number of:			
- Active Members	8,636	8,489	8,489
- Retirees and Beneficiaries	9,074	8,815	8,815
- Inactive, Non-retired Members**	5,697	5,417	5,417
- Total	23,407	22,721	22,721
· Covered Payroll	$586.82	$568.56	$568.56

Highlights/Changes:

- A new tier of benefits is effective for new entrants as of July 1, 2011. See Section G for details.
- Total scheduled contribution increased 1.00% from 18.50% to 19.50%, effective January 1, 2015.
- The aggregate actuarial loss was $71.15 million, with $55.77 million due to continued recognition of past asset losses.
- The amortization methodology was changed from "open" to "closed bases", effective January 1, 2013, and is detailed in Section B.

* These results are on a baseline basis. Baseline results are net of the DHHA supplement. The 2016 Total Contribution Amount including the DHHA supplement is $110,246,284 (18.79% of payroll), and for 2015 is $105,097,078 (18.48% of payroll).

** The number of Inactive, Non-retired Members includes 2,233 Non-vested Inactive Members as of January 1, 2016, and 1,951 Non-vested Inactive Members as of January 1, 2015, who are not vested in any benefit other than their accumulated contributions.

Retiree Medical Plan - Executive Summary

($ in Millions)

Valuation Date:	January 1, 2016	January 1, 2015	January 1, 2015
Fiscal Year Ending:	December 31, 2016	December 31, 2015	December 31, 2015
Discount Rate	7.75%	7.75%	8.00%
Actuarial Information:			
· Normal Cost %	0.44%	0.47%	0.45%
· Actuarial Accrued Liability (AAL)	$153.25	$152.92	$149.57
· Unfunded Actuarial Accrued Liability (UAAL)	$72.87	$70.73	$67.38
· Funded Ratio	52.45%	53.75%	54.95%
· UAAL as % of Covered Payroll	12.42%	12.44%	11.85%
· Equivalent Single Amortization Period	27.1 years	28.1 years	28.0 years
Required Contributions:			
· Normal Cost	$2.58	$2.65	$2.56
· Amortization of the Unfunded Liability	$4.44	$4.23	$4.14
· Total Contribution Amount*	$7.02	$6.89	$6.70
· Percentage of Covered Payroll	1.20%	1.21%	1.18%
Assets:			
· Market Value	$70.83	$77.86	$77.86
· Actuarial Value	$80.38	$82.19	$82.19
· Return on Market Value	-1.93%	4.97%	4.97%
· Return on Actuarial Value	4.75%	6.65%	6.65%
· Ratio – Actuarial Value to Market Value	113.49%	105.57%	105.57%

Highlights/Changes:

- No changes to benefit provisions.
- The aggregate investment and liability experience loss was $1.62 million.
- The amortization methodology was changed from "open" to "closed bases", effective January 1, 2013, and is detailed in Section B.

* These results are on a baseline basis. Baseline results are net of the DHHA supplement. The 2016 Total Contribution Amount including the DHHA supplement is $7,054,251 (1.21% of payroll), and for 2015 is $6,915,642 (1.21% of payroll).

Contribution Summary
Combined Basis

Valuation Date:	January 1, 2016	January 1, 2015	January 1, 2015
Discount Rate	7.75%	7.75%**	8.00%
Fiscal Year Ending:	December 31, 2016	December 31, 2015	December 31, 2015
Total Contribution Percent			
· Pension	18.35%	18.07%	17.16%
· Retiree Medical	1.20%	1.21%	1.18%
· Total	19.55%	19.28%	18.34%
Total Scheduled Contribution	19.50%	19.50%	19.50%
Contribution Surplus / (Shortfall)*	(0.05%)	0.22%	1.16%

*There is generally a one year lag in implementing a change in the contribution requirement.

**The discount rate of 7.75% was changed effective October 1, 2015.

Discussion

Actuarial Valuation

Valuations are prepared annually, as of January 1 of each year, the first day of DERP's fiscal year. Valuations are prepared for the Pension and Retiree Medical Plans. Normal Cost is separately calculated for the Hospital and Non-Hospital employee groups, in order to determine the DHHA supplemental contribution amount (see Section I).

The primary purposes of the valuation report are to measure the plan's liabilities, to determine the required contribution rate and to analyze changes in DERP's actuarial position.

In addition, the report provides summaries of the member data, financial data, plan provisions, and actuarial assumptions and methods.

Financing Objectives

DERP is supported by member contributions, employer contributions, and net earnings on the investments of the fund. The member and employer contribution rates are set by law. Employer rates increased from 11.20% to 11.50% effective January 1, 2015. Member rates increased from 7.30% to 8.00% effective January 1, 2015.

The combined member and employer contributions are intended to be sufficient to pay the normal cost and to amortize the Unfunded Actuarial Accrued Liability (UAAL) over a closed period of 30 years from the valuation date. An amortization base will be established each year and each new base will be paid off over 30 years, using annual payments determined as a level percentage of payroll. Each base and full payment schedule is shown in the Appendix.

Contribution Requirement

The Total Computed Contribution required for the Pension Plan for the fiscal year ending December 31, 2016 is $107,668,331, 18.35% of covered payroll ($110,246,284, 18.79% of covered payroll including the DHHA Supplement). This compares with a Total Computed Contribution for the fiscal year ending December 31, 2015 of $102,763,088, 18.07% of covered payroll ($105,097,078, 18.48% of covered payroll including the DHHA Supplement).

The Total Computed Contribution required for the Retiree Medical Plan for the fiscal year ending December 31, 2016 is $7,020,639, 1.20% of covered payroll ($7,054,251, 1.21% of covered payroll including the DHHA Supplement). This compares with a Total Computed Contribution for the fiscal year ending December 31, 2015 of $6,886,247, 1.21% of covered payroll ($6,915,642, 1.21% of covered payroll including the DHHA Supplement).

The method used to determine the actuarial value of assets smoothes the differences between the actuarial and market values by recognizing 20% of the difference each year. The actuarial value is approaching the market value. Last year, the difference between the actuarial and market values was $77 million for the pension plan. The less-than-expected 2015 investment returns increased the gap between the actuarial value and market value to $223 million. The rate of return on a market value basis was -1.96%; on an actuarial basis it was 5.09%.

The amortization payment is the 30 year, level percent of pay payment required on the new UAL base established for each year. The schedule is shown in Section B and the details for each base are shown in the appendix. In the early years (approximately the first 12 years) the base grows, and then declines to zero by the end of the 30 year period.

The contribution rate increased from 19.28% of pay to 19.55%. This increase was largely due to the return on investments being lower than expected and a small liability loss.

Funded Status

As of the valuation date, the Unfunded Actuarial Accrued Liability (UAAL) for the Pension Plan is $834.84 million, and the funded ratio (the ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability) is 72.21%. At the time of last year's valuation, based on a 7.75% discount rate assumption, the UAAL was $761.64 million, and the funded ratio was 73.68%. See Section D for a history of the funded ratios.

As of the valuation date, the Unfunded Actuarial Accrued Liability (UAAL) for the Retiree Medical Plan is $72.87 million, and the funded ratio (the ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability) is 52.45%. At the time of last year's valuation, based on a 7.75% discount rate assumption, the UAAL was $70.73 million, and the funded ratio was 53.75%. See Section D for a history of the funded ratios.

The funded status measure may be appropriate for assessing the need for future contributions. The funded status is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations.

Gains and Losses

The Pension Plan experienced a total aggregate actuarial loss of $71.15 million, which includes an investment loss of $55.77 million (based on the Actuarial Value of Assets), and a non-investment loss of $15.38 million.

The Retiree Medical Plan experienced a total aggregate actuarial loss of $1.62 million, which includes an investment loss of $2.39 million (based on the Actuarial Value) and a non-investment gain of $0.77 million.

Valuation Assets

The funding policy for both the Pension Plan and the Retiree Medical Plan includes smoothing returns. Smoothing assets creates a more stable contribution rate. The 2015 return on the Actuarial Value of Assets for the Pension Plan was 5.09%, while the return on a Market Value basis was -1.96%. The 2015 return on the Actuarial Value of Assets for the Retiree Medical Plan was 4.75%, while the return on a Market Value basis was -1.93%.

The Actuarial Value of Assets exceeds the Market Value of Assets by $223.08 million for the Pension Plan and the Actuarial Value of Assets exceeds the Market Value of Assets by $9.56 million for the Retiree Medical Plan as of the valuation date (see Section C).

Funded Ratio Based on the Market Value of Assets

If Market Value had been the basis for the valuation, the funded ratios would have been 64.78%, for the Pension Plan and 46.21% for the Retiree Medical Plan.

Benefit Provisions

This valuation reflects the benefits as summarized in Section G of this report.

Actuarial Assumptions and Methods

In determining costs and liabilities, actuaries use assumptions about the future, such as rates of salary increase, probabilities of retirement, termination, death and disability, and an investment return assumption. The Retirement Board sets the actuarial assumptions and methods taking into account recommendations made by the plan's actuary and other advisors. There have been no assumption changes since the prior valuation

We believe the assumptions are internally consistent and are reasonable, based on the actual experience of DERP.

The results of the actuarial valuation are dependent on 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 amortization periods.

In addition to the actuarial assumptions, the actuary also makes use of an Actuarial Cost Method to allocate costs to particular years. DERP uses the Projected Unit Credit method. This method determines an accrued liability based on projected compensation, and uses service to the valuation date. The unfunded accrued liability is then amortized on a 30-year amortization basis, as a level percent of pay, with bases established each year. Prior to the January 1, 2013 valuation, the unfunded liability was amortized on an open 30-year period on a level dollar basis.

Member Data

The number of active members increased by 1.73% from 8,489 to 8,636 and average covered pay for active members increased from $66,976 to $67,950, a 1.45% increase. Average age of active members is 45.1, compared to 45.5 last year. Average years of service is 10.6, compared to 10.9 last year. There are also 5,697 inactive vested members, which includes 2,233 members vested in member contributions only.

The number of members in payment status increased by 259, from 8,815 to 9,074. This number includes service retirees, disability retirees, and beneficiaries receiving benefits. The average annual service retiree benefit is $20,989 and there are 0.95 active members for each member in payment status.

There were three “show-up” retirees this year who were not in the valuation data last year, which led to a negligible actuarial loss.

GASB Reporting

The Governmental Accounting Standards Board (GASB) Statement No. 67, Financial Reporting for Pension Plans (Issued 6/2012), has replaced the requirements under GASB Statement No.25, Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans (Issued 11/1994), effective for financial statements for fiscal years beginning after June 15, 2013. Actuarial information for GASB 67 has been supplied under a separate cover.

GASB No. 43

Governmental Accounting Standards Board (GASB) Statement No. 43 governs financial reporting for postemployment benefits other than pension plans. These liabilities shown in the report in Section D represent solely the value of the explicit benefit, without regard to the implicit rate subsidy. While the explicit benefit is valued in compliance with all parameters established by GASB Statements No. 43 and No. 45, it is not the intention of this report to satisfy the requirement of those GASB statements. The value of any implicit rate subsidy in the city-sponsored health plans will be illustrated in the disclosures related to those plans.

SECTION B

FUNDING RESULTS

Pension Plan
Principal Valuation Results
as of January 1*

Valuation Date	**2016**	**2015**
Covered Group		
A. Number of Participants:		
Actives Members	8,636	8,489
Vested Inactive Members**	5,697	5,417
Retirees and Beneficiaries	9,074	8,815
Total	23,407	22,721
Covered Annual Payroll	$ 586,819,180	$ 568,562,500

Development of Contribution Rate For Fiscal Year Ending	**2016**	**2015**
B. Normal Cost	$ 57,171,025	$ 57,388,314
% of pay	*9.74%*	*10.09%*
C. Unfunded Actuarial Accrued Liabilities (UAAL):		
Actuarial Accrued Liability	$ 3,003,589,809	$ 2,893,668,352
Actuarial Value of Assets	2,168,754,097	2,132,024,635
UAAL	$ 834,835,712	$ 761,643,717
Payment required to amortize UAAL	$ 50,497,306	$ 45,374,774
% of pay	*8.61%*	*7.98%*
D. Total Computed Contribution	$ 107,668,331	$ 102,763,088
% of pay	*18.35%*	*18.07%*

* Separate figures for DHHA are provided in Section I of this report

** The number of Vested Inactive Members includes 2,233 Inactive Members as of January 1, 2016, and 1,951 Inactive Members as of January 1, 2015, who are only vested in their contribution account.

Retiree Medical Plan
Principal Valuation Results
as of January 1*

Development of Contribution Rate **For Fiscal Year Ending**	**2016**	**2015**
A. Normal Cost	$ 2,581,047	$ 2,654,842
% of pay	*0.44%*	*0.47%*
B. Unfunded Actuarial Accrued Liabilities (UAAL):		
Actuarial Accrued Liability	$ 153,254,546	$ 152,922,281
Actuarial Value of Assets	80,383,172	82,194,505
UAAL	$ 72,871,374	$ 70,727,776
Payment required to amortize UAAL	$ 4,439,593	$ 4,231,406
% of pay	*0.76%*	*0.74%*
C. Total Computed Contribution	$ 7,020,640	$ 6,886,248
% of pay	*1.20%*	*1.21%*

* Separate figures for DHHA are provided in Section I of this report

Amortization of Actuarial Liabilities as of January 1, 2016

	Pension	Retiree Medical
UAAL as of January 1, 2016	$834,835,712	$72,871,374
Total Prior Remaining Bases as of January 1, 2016	771,779,786	71,649,839
2016 Base as of January 1, 2016	$63,055,926	$1,221,535
2016 Payment (30 years, level % of pay)	$3,647,853	$70,667

			Pension			Retiree Medical		
Year	Appendix	Years Remaining	Initial Base	Amortization Payment	Remaining Base	Initial Base	Amortization Payment	Remaining Base
2016	2016 Amortization Schedule	30	$63,055,926	$3,647,853	$63,055,926	$1,221,535	$70,667	$1,221,535
2015	2015 Amortization Schedule	29	115,521,828	6,900,261	117,273,770	2,689,556	160,650	2,730,344
2014	2014 Amortization Schedule	28	13,967,932	862,028	14,389,576	106,216	6,555	109,423
2013	2013 Amortization Schedule	27	612,986,163	39,087,164	640,116,440	65,893,671	4,201,721	68,810,072
					$834,835,712			**$72,871,374**
Total Amortization Payment				**$50,497,306**			**$4,439,593**	

See Appendix for amortization schedules for each base

Pension Plan
Actuarial Liabilities
as of January 1, 2016

	Actuarial Present Value of Future Benefits (1)	**Portion Covered by Future Normal Cost Contributions (2)**	**Actuarial Accrued Liabilities (1) - (2)**
Active members:			
Retirement	$1,217,886,091	$387,487,153	$830,398,938
Disability	55,837,872	20,083,795	35,754,077
Death	25,028,404	9,163,313	15,865,091
Termination	129,308,434	46,661,922	82,646,512
Vested inactive members	185,528,934	0	185,528,934
DROP participant - account balances	113,006,463	0	113,006,463
Retirees and Beneficiaries	1,740,389,794	0	1,740,389,794
Total	$3,466,985,992	$463,396,183	$3,003,589,809
Actuarial Value of Assets	$2,168,754,097	$0	$2,168,754,097
Liabilities to be covered by Future Contributions	$1,298,231,895	$463,396,183	$834,835,712

Retiree Medical Plan
Actuarial Liabilities
as of January 1, 2016

	Actuarial Present Value of Future Benefits (1)	**Portion Covered by Future Normal Cost Contributions (2)**	**Actuarial Accrued Liabilities (1) - (2)**
Active members:			
Retirement	$54,307,322	$16,359,308	$37,948,014
Disability	3,061,305	1,083,222	1,978,083
Death	1,244,536	453,026	791,510
Termination	3,532,979	1,234,518	2,298,461
Vested inactive members	8,845,835	0	8,845,835
DROP participants	0	0	0
Retirees and Beneficiaries	101,392,643	0	101,392,643
Total	$172,384,620	$19,130,074	$153,254,546
Actuarial Value of Assets	$80,383,172	$0	$80,383,172
Liabilities to be covered by Future Contributions	$92,001,448	$19,130,074	$72,871,374

Pension Plan
Actuarial Balance Sheet as of January 1
Assets and Present Value of Expected Future Contributions

	2016	2015
A. Actuarial Value of Assets		
1. Net assets from system financial statements	$1,945,673,317	$2,055,272,548
2. Adjustment for Valuation Assets*	223,080,780	76,752,087
3. Actuarial Value of Assets	$2,168,754,097	$2,132,024,635
B. Actuarial Present Value of Expected Future Contributions		
1. For Normal Costs	$463,396,183	$461,995,629
2. For Unfunded Actuarial Accrued Liability	834,835,712	761,643,717
3. Total	$1,298,231,895	$1,223,639,346
C. Total Present and Expected Future Resources (equals Present Value of Benefits)	$3,466,985,992	$3,355,663,981

**See page 23 for the development of the actuarial value of assets.*

Retiree Medical Plan
Actuarial Balance Sheet as of January 1
Assets and Present Value of Expected Future Contributions

	2016	2015
A. Actuarial Value of Assets		
1. Net assets from system financial statements	$70,826,147	$77,855,933
2. Adjustment for Valuation Assets*	9,557,025	4,338,572
3. Actuarial Value of Assets	$80,383,172	$82,194,505
B. Actuarial Present Value of Expected Future Contributions		
1. For Normal Costs	$19,130,074	$19,505,036
2. For Unfunded Actuarial Accrued Liability	72,871,374	70,727,776
3. Total	$92,001,448	$90,232,812
C. Total Present and Expected Future Resources (equals Present Value of Benefits)	$172,384,620	$172,427,317

**See page 24*

Pension Plan
Reconciliation of Actuarial Accrued Liability
as of January 1

(rounded to the nearest $100)

1. Actuarial Accrued Liability (AAL) as of January 1, 2015:		$ 2,893,668,400
2. Development of expected AAL as of January 1, 2016:		
a. Normal cost (NC) for prior plan year		$ 59,722,300
b. Actual benefit payments paid during plan year (BP)		183,992,100
c. Interest on AAL and NC less interest on BP to December 31, 2015		218,806,500
d. Expected AAL as of January 1, 2016 (1.+2.a.-2.b.+2.c.)		$ 2,988,205,100
3. Changes in AAL due to:		
a. Actual experience versus demographic assumptions (Gain)/Loss:		
i. Salary increases	$ 6,672,100	
ii. Retirement	1,478,100	
iii. Mortality - pre and post	(2,635,800)	
iv. Vested termination	1,743,100	
v. Non vested termination	2,285,500	
vi. Disability	(624,300)	
vii. Other plan experience and data changes	3,697,900	
viii. New entrants	2,768,100	
Total change due to experience		$ 15,384,700
b. Increase in Refund Benefit Due to Contribution Rate Increase		-
c. Total (3.a.+ 3.b)		$ 15,384,700
4. Actuarial Accrued Liability as of January 1, 2016 (2.d.+3.c.)		$ 3,003,589,800

Retiree Medical Plan
Reconciliation of Actuarial Accrued Liability
as of January 1

(rounded to the nearest $100)

1. Actuarial Accrued Liability (AAL) as of January 1, 2015:		$ 152,922,300
2. Development of expected AAL as of January 1, 2016:		
a. Normal cost (NC) for plan year		$ 2,684,200
b. Actual benefit payments paid during plan year (BP)		12,986,200
c. Interest on AAL and NC less interest on BP to December 31, 2015		11,408,400
d. Expected AAL as of January 1, 2016 (1.+2.a.-2.b.+2.c.)		$ 154,028,700
3. Changes in AAL due to:		
a. Actual experience versus demographic assumptions (Gain)/Loss:		
i. Salary increases	-	
ii. Retirement	$ 399,900	
iii. Mortality - pre and post	(148,800)	
iv. Vested termination	(45,500)	
v. Non-vested termination and benefit opt-outs	(602,400)	
vi. Disability	(96,800)	
vii. Other plan experience and data changes	(412,300)	
viii. New entrants	131,700	
Total change due to experience		$ (774,200)
b. Change in actuarial assumptions		-
c. Total (3.a.+ 3.b)		$ (774,200)
4. Actuarial Accrued Liability as of January 1, 2016 (2.d.+3.c.)		$ 153,254,500

SECTION C

PLAN ASSETS

Pension Plan
Statement of Plan Assets
(Assets at Market or Fair Value)

	December 31	
Item	**2015**	**2014**
A. Assets:		
1. Cash and Cash Equivalents (Operating Cash)	$42,022,653	$42,084,429
2. Securities Lending Collateral	224,498,009	251,622,360
3. Capital Assets	4,599,634	4,809,438
4. Prepaid items	0	0
5. Total Assets	$271,120,296	$298,516,227
B. Receivables:		
1. Contributions	$0	$0
2. Unsettled Securities Sold	2,851,063	1,723,039
3. Interest and Dividends	1,751,919	1,574,967
4. Total Receivables	$4,602,982	$3,298,006
C. Investments:		
1. U.S. Government Obligations	$146,887,967	$153,802,966
2. Domestic Fixed Income	233,731,028	219,630,577
3. Domestic Equities	437,047,513	520,572,322
4. International Equities	464,643,057	504,345,956
5. Real Estate	177,139,987	155,950,822
6. Alternative Investments	340,871,122	349,709,718
7. Absolute Return	100,328,943	104,883,901
8. Total Investments	$1,900,649,617	$2,008,896,262
D. Liabilities:		
1. Unsettled Securities Purchased	($224,498,009)	($1,243,611)
2. Securities Lending Obligations	(2,498,435)	(251,622,360)
3. Accounts Payable	(3,703,134)	(2,571,976)
4. Total Liabilities	($230,699,578)	($255,437,947)
E. Total Market Value of Assets Available for Benefits	$1,945,673,317	$2,055,272,548
F. Allocation of Investments:		
1. U.S. Government Obligations	7.73%	7.66%
2. Domestic Fixed Income	12.30%	10.93%
3. Domestic Equities	22.99%	25.91%
4. International Equities	24.45%	25.11%
5. Real Estate	9.32%	7.76%
6. Alternative Investments	17.93%	17.41%
7. Absolute Return	5.28%	5.22%
8. Total Investments	100.00%	100.00%

Retiree Medical Plan
Statement of Plan Assets
(Assets at Market or Fair Value)

Item	December 31 2015	2014
A. Assets:		
1. Cash and Cash Equivalents (Operating Cash)	$1,560,108	$1,594,203
2. Securities Lending Collateral	8,168,562	9,531,725
3. Capital Assets	167,362	182,187
4. Prepaid items	0	0
5. Total Assets	$9,896,032	$11,308,115
B. Receivables:		
1. Contributions	$0	$0
2. Unsettled Securities Sold	103,739	65,271
3. Interest and Dividends	63,745	59,662
4. Total Receivables	$167,484	$124,933
C. Investments:		
1. U.S. Government Obligations	$5,344,651	$5,826,222
2. Domestic Fixed Income	8,504,513	8,319,842
3. Domestic Equities	15,902,366	19,719,839
4. International Equities	16,906,455	19,105,167
5. Real Estate	6,445,397	5,907,585
6. Alternative Investments	12,402,902	13,247,379
7. Absolute Return	3,650,559	3,973,115
8. Total Investments	$69,156,843	$76,099,149
D. Liabilities:		
1. Unsettled Securities Purchased	($134,742)	($47,109)
2. Securities Lending Obligations	(8,168,562)	(9,531,725)
3. Accounts Payable	(90,908)	(97,430)
4. Total Liabilities	($8,394,212)	($9,676,264)
E. Total Market Value of Assets Available for Benefits	$70,826,147	$77,855,933
F. Allocation of Investments:		
1. U.S. Government Obligations	7.73%	7.66%
2. Domestic Fixed Income	12.30%	10.93%
3. Domestic Equities	22.99%	25.91%
4. International Equities	24.45%	25.11%
5. Real Estate	9.32%	7.76%
6. Alternative Investments	17.93%	17.41%
7. Absolute Return	5.28%	5.22%
8. Total Investments	100.00%	100.00%

Pension Plan
Reconciliation of Plan Assets

Item	December 31 2015	2014
A. Market Value of Assets at Beginning of Year	$2,055,272,548	$2,030,538,678
B. Revenues and Expenditures:		
1. Contributions:		
a. Employee Contributions	$46,689,696	$39,521,451
b. Employer Contributions	67,234,597	59,941,041
c. Purchased Service Credit	-	-
d. Total	$113,924,293	$99,462,492
2. Investment Income:		
a. Interest, Dividends, and Other Income	($21,824,960)	$115,270,887
b. Net Securities Lending Income	953,808	674,581
c. Investment Expenses	(14,874,877)	(14,349,764)
d. Net Investment Income	($35,746,029)	$101,595,704
3. Benefits and Refunds:		
a. Refunds	($2,164,104)	($1,507,554)
b. Regular Monthly Benefits	(176,046,015)	(165,459,232)
c. DROP and DROP II Benefits	(5,781,960)	(5,719,243)
d. Partial Lump-Sum Benefits Paid	-	-
e. Total	($183,992,079)	($172,686,029)
4. Administrative and Miscellaneous Expenses	($3,785,416)	($3,638,296)
5. Transfers	$0	$0
C. Market Value of Assets at End of Year	$1,945,673,317	$2,055,272,548

Retiree Medical Plan
Reconciliation of Plan Assets

Item	December 31 2015	2014
A. Market Value of Assets at Beginning of Year	$77,855,933	$79,877,187
B. Revenues and Expenditures:		
1. Contributions:		
a. Employee Contributions	$3,026,103	$2,725,316
b. Employer Contributions	4,380,107	4,332,376
c. Purchased Service Credit	-	-
d. Total	$7,406,210	$7,057,692
2. Investment Income:		
a. Interest, Dividends, and Other Income	($793,022)	$4,492,576
b. Net Securities Lending Income	35,530	26,114
c. Investment Expenses	(551,036)	(551,827)
d. Net Investment Income	($1,308,528)	$3,966,863
3. Benefits and Refunds:		
a. Refunds	($80,925)	($58,314)
b. Regular Monthly Benefits	(12,905,247)	(12,846,786)
c. Partial Lump-Sum Benefits Paid	-	-
d. Total	($12,986,172)	($12,905,100)
4. Administrative and Miscellaneous Expenses	($141,296)	($140,710)
5. Transfers	$0	$0
C. Market Value of Assets at End of Year	$70,826,147	$77,855,933

Pension Plan
Development of Actuarial Value of Assets

	Year Ending – December 31	**2015**	**2014**
A.	Actuarial Value of Assets (AVA) Beginning of Year	$2,132,024,635	$2,062,322,953
B.	Market Value (MV) End of Year	1,945,673,317	2,055,272,548
C.	Market Value Beginning of Year	2,055,272,548	2,030,538,678
D.	Increases During the Year:		
	D1. Member Contributions	$46,689,696	$39,521,451
	D2. Employer Contributions	67,234,597	59,941,041
	D3. Expected Return	162,567,443	162,113,241
	D4. Total Increases	$276,491,736	$261,575,733
E.	Decreases During the Year:		
	E1. Retirement Benefits	($181,827,975)	($171,178,475)
	E2. Refund of Member Accounts	(2,164,104)	(1,507,554)
	E3. Member Balance Transfers	0	0
	E4. Total Decreases	($183,992,079)	($172,686,029)
F.	Projected Actuarial Value of Assets (A. + D.4. + E.4.)	$2,224,524,292	$2,151,212,657
G.	Difference in Projected AVA and MV (B.-F.)	($278,850,975)	($95,940,109)
H.	Appreciation/(Depreciation) recognized: 20% of G.	($55,770,195)	($19,188,022)
I.	Actuarial Value of Assets End of Year (F. + H.)	$2,168,754,097	$2,132,024,635
J.	Unrecognized Difference in AVA and MV (B.-I.)	($223,080,780)	($76,752,087)
K.	Actuarial Rate of Return	5.09%	7.06%
L.	Market Value Rate of Return	-1.96%	4.91%
M.	Ratio of Actuarial Value of Assets to Market Value	111%	104%

Retiree Medical Plan
Development of Actuarial Value of Assets

	Year Ending – December 31	2015	2014
A.	Actuarial Value of Assets (AVA) Beginning of Year	$82,194,505	$82,736,993
B.	Market Value (MV) End of Year	$70,826,147	77,855,933
C.	Market Value Beginning of Year	$77,855,933	79,877,187
D.	Increases During the Year:		
	D1. Member Contributions	$3,026,103	$2,725,316
	D2. Employer Contributions	4,380,107	4,332,376
	D3. Refund of Member Accounts	0	0
	D4. Expected Return	6,157,885	6,389,563
	D5. Total Increases	$13,564,095	$13,447,255
E.	Decreases During the Year:		
	E1. Retirement Benefits	($12,905,247)	($12,846,786)
	E2. Refund of Member Accounts	(80,925)	(58,314)
	E3. Member Balance Transfers	0	0
	E4. Total Decreases	($12,986,172)	($12,905,100)
F.	Projected Actuarial Value of Assets (A. + D.5. + E.4.)	$82,772,428	$83,279,148
G.	Difference in Projected AVA and MV (B.-F.)	($11,946,281)	($5,423,215)
H.	Appreciation/(Depreciation) recognized: 20% of G.	($2,389,256)	($1,084,643)
I.	Actuarial Value of Assets End of Year (F. + H.)	$80,383,172	$82,194,505
J.	Unrecognized Difference in AVA and MV (B.-I.)	($9,557,025)	($4,338,572)
K.	Actuarial Rate of Return	4.75%	6.65%
L.	Market Value Rate of Return	-1.93%	4.97%
M.	Ratio of Actuarial Value of Assets to Market Value	113%	106%

History of Investment Return Rates

Plan Year Ending December 31 of (1)	Pension Plan Market (2)	Pension Plan Actuarial (3)	Retiree Medical Market (4)	Retiree Medical Actuarial (5)
2002	(8.65%)	3.50%	(8.68%)	3.80%
2003	19.35%	6.10%	19.29%	6.10%
2004	11.10%	7.10%	11.03%	7.00%
2005	9.28%	7.50%	9.24%	7.40%
2006	13.72%	8.68%	13.72%	8.58%
2007	10.57%	9.10%	10.60%	9.04%
2008	(26.17%)	1.74%	(26.06%)	1.74%
2009	13.74%	3.39%	13.59%	3.23%
2010	13.89%	4.98%	13.66%	4.66%
2011	(0.31%)	3.94%	(0.23%)	3.61%
2012	12.54%	5.41%	12.60%	4.97%
2013	17.99%	7.59%	18.22%	7.11%
2014	4.91%	7.06%	4.97%	6.65%
2015	(1.96%)	5.09%	(1.93%)	4.75%
Average annual returns:				
Last five years:	6.37%	5.81%	6.45%	5.41%
Last ten years:	5.06%	5.68%	5.08%	5.41%
Standard deviation:				
Last five years:	8.50%	1.49%	8.56%	1.44%
Last ten years:	13.03%	2.38%	13.00%	2.36%

The above rates are based on the retirement plan's financial information reported to the actuary. They may differ from figures that the investment consultant reports, in part because of differences in the handling of administrative and investment expenses, and in part because of differences in the handling of cash flows. Figures prior to 2007 were provided by the previous actuary and DERP.

Pension Plan**
History of Cash Flow in Trust Fund

Plan Year Ending December 31	Total Contributions	Benefits and Refunds	Administrative Expenses	Transfers and Other	Net Investment Return*	Market Value of Assets at End of Year
2000						$1,488,342,575
2001	$43,990,992	($57,770,905)	($1,918,365)	-	($85,618,821)	1,387,025,476
2002	47,338,877	(62,334,251)	(1,955,993)	-	(117,388,491)	1,252,685,618
2003	45,899,111	(67,889,993)	(2,098,088)	-	242,309,261	1,470,905,909
2004	44,864,380	(76,437,075)	(2,211,322)	-	163,674,788	1,600,796,680
2005	48,595,153	(86,212,631)	(2,464,874)	-	149,237,500	1,709,951,828
2006	49,245,410	(95,645,656)	(2,618,710)	-	234,113,308	1,895,046,180
2007	52,934,416	(105,316,959)	(2,469,185)	-	199,977,322	2,040,171,774
2008	57,167,418	(115,583,559)	(2,839,820)	-	(523,370,681)	1,455,545,132
2009	55,976,584	(121,622,108)	(2,558,311)	-	198,018,642	1,585,359,939
2010	63,367,957	(138,058,331)	(2,555,677)	-	217,566,113	1,725,680,001
2011	71,814,123	(143,057,219)	(2,883,909)	-	(2,396,020)	1,649,156,976
2012	80,419,886	(150,418,610)	(3,334,741)	-	205,809,820	1,781,633,331
2013	93,565,820	(159,337,067)	(3,597,603)	-	318,274,197	2,030,538,678
2014	99,462,492	(172,686,029)	(3,638,296)	-	101,595,704	2,055,272,548
2015	113,924,293	(183,992,079)	(3,785,416)	-	(35,746,029)	1,945,673,317

Retiree Medical Plan**
History of Cash Flow in Trust Fund

Plan Year Ending December 31	Total Contributions	Benefits and Refunds	Administrative Expenses	Transfers and Other	Net Investment Return*	Market Value of Assets at End of Year
2000						$85,267,950
2001	$6,213,943	($5,672,171)	($110,628)	-	($4,910,543)	80,788,551
2002	3,556,073	(6,561,307)	(112,517)	-	(6,766,350)	70,904,450
2003	4,567,891	(7,588,370)	(117,418)	-	13,503,048	81,269,601
2004	3,928,526	(8,419,647)	(120,227)	-	8,832,033	85,490,236
2005	4,568,782	(9,209,929)	(129,711)	-	7,812,975	88,532,353
2006	5,263,707	(9,943,879)	(133,977)	-	11,955,835	95,674,039
2007	5,802,249	(10,632,418)	(123,382)	-	10,012,367	100,732,855
2008	5,437,137	(10,846,558)	(138,364)	-	(25,408,688)	69,776,382
2009	5,842,767	(11,023,712)	(120,955)	-	9,252,242	73,726,724
2010	4,875,366	(11,738,126)	(115,362)	-	9,714,426	76,463,028
2011	6,531,390	(12,513,090)	(125,390)	-	(42,792)	70,313,146
2012	6,733,970	(12,486,097)	(139,510)	-	8,635,748	73,057,257
2013	6,678,438	(12,625,256)	(145,169)	-	12,911,917	79,877,187
2014	7,057,692	(12,905,100)	(140,710)	-	3,966,863	77,855,933
2015	7,406,210	(12,986,172)	(141,296)	-	(1,308,528)	70,826,147

*Net of Investment Expense

**Figures prior to 2007 were provided by the previous actuary.

SECTION D

HISTORICAL SCHEDULES

Pension Plan*
Schedule of Funding Progress
($ in millions)

Valuation Date January 1	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Unfunded AAL (UAAL) [(3) - (2)]	Funded Ratio [(2)/(3)]	Covered Payroll	UAAL as a Percentage of Covered Payroll [(4)/(6)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2004	$1,572.94	$1,604.53	$31.59	98.03%	$506.52	6.24%
2005	1,651.09	1,665.54	14.45	99.13%	495.17	2.92%
2006	1,735.21	1,782.50	47.30	97.35%	495.29	9.55%
2007	1,837.48	1,862.77	25.30	98.64%	499.46	5.06%
2008	1,950.01	1,985.65	35.64	98.21%	545.84	6.53%
2009	1,924.99	2,095.89	170.90	91.85%	564.99	30.25%
2010	1,923.56	2,176.24	252.68	88.39%	506.05	49.93%
2011	1,942.87	2,284.76	341.88	85.04%	517.40	66.08%
2012	1,946.84	2,386.53	439.69	81.58%	517.40	84.98%
2013	1,980.20	2,593.19	612.99	76.36%	531.56	115.32%
2014	2,062.32	2,699.00	636.68	76.41%	540.23	117.85%
2015	2,132.02	2,893.67	761.64	73.68%	568.56	133.96%
2016	2,168.75	3,003.59	834.84	72.21%	586.82	142.26%

*Figures prior to 2008 were provided by the previous actuary.

Retiree Medical Plan*
Schedule of Funding Progress**
($ in millions)

Valuation Date January 1	Actuarial Value of Assets	Actuarial Accrued Liability (AAL)	Unfunded AAL (UAAL) [(3) - (2)]	Funded Ratio [(2)/(3)]	Covered Payroll	UAAL as a Percentage of Covered Payroll [(4)/(6)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2004	$87.11	$105.48	$18.37	82.59%	$506.52	3.63%
2005	88.53	116.57	28.04	75.95%	495.17	5.66%
2006	90.23	123.78	33.55	72.90%	495.29	6.77%
2007	93.09	127.13	34.04	73.22%	499.46	6.82%
2008	96.46	128.61	32.15	75.00%	545.84	5.89%
2009	92.68	134.00	41.32	69.17%	564.99	7.31%
2010	90.41	141.64	51.23	63.83%	506.05	10.12%
2011	87.61	143.11	55.50	61.22%	517.40	10.73%
2012	84.68	142.97	58.29	59.23%	517.40	11.27%
2013	82.99	148.89	65.89	55.74%	531.56	12.40%
2014	82.74	149.78	67.05	55.24%	540.23	12.41%
2015	82.19	152.92	70.73	53.75%	568.56	11.93%
2016	80.38	153.25	72.87	52.45%	586.82	12.42%

*Figures prior to 2008 were provided by the previous actuary.

**These liabilities represent solely the value of the explicit benefit, without regard to the implicit rate subsidy. The explicit benefit is valued in compliance with all the parameters established by GASB Statements No. 43 and No.45. The value of any implicit rate subsidy in the city-sponsored health plans will be illustrated in the disclosures related to those plans.

Schedule of Employer Contributions

Pension Plan*

Year Beginning January 1:	**Annual Required Contribution (ARC)**		**Contributions ***		**Percentage of ARC Contributed**
	% of Payroll[9]	**Amount**	**% of Payroll[9]**	**Amount[1]**	**[(5)/(3)]**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
2005[2]	7.68%	$38,039,016	7.54%	$37,347,133	98.18%
2006	8.54%	42,277,066	7.63%	37,809,048	89.43%
2007	7.93%	39,623,830	8.20%	40,955,026	103.36%
2008	7.64%	41,699,683	8.13%	44,362,545	106.39%
2009	9.63%	54,392,610	7.63%	43,127,064	79.29%
2010[3]	9.68%	48,995,846	8.34%	42,228,203	86.19%
2011[4]	10.05%	52,000,472	8.83%	45,703,351	87.89%
2012[5]	10.83%	56,054,792	9.62%	49,756,639	88.76%
2013[6]	10.42%	55,397,564	10.62%	56,427,308	101.86%
2014[7]	10.34%	55,871,677	11.10%	59,941,041	107.28%
2015[8]	10.52%	59,811,786	11.83%	67,234,597	112.41%
2016	10.83%	63,523,937	N/A	N/A	N/A

*Figures prior to 2008 were provided by the previous actuary.

[1] Employers made contributions based on the legally required rates.

[2] Beginning on January 1, 2005, the employers and employees contributed 8.50% and 2.50%, respectively.

[3] Beginning on January 1, 2010, the employers and employees contributed 8.50% and 4.50%, respectively.

[4] Beginning on January 1, 2011, the employers and employees contributed 9.50% and 5.50%, respectively.

[5] Beginning on January 1, 2012, the employers and employees contributed 10.25% and 6.25%, respectively.

[6] Beginning on January 1, 2013, the employers and employees contributed 11.00% and 7.00%, respectively and amortization method changed from level dollar 30-year open to level percent of pay 30-year closed bases.

[7] Beginning on January 1, 2014, the employers and employees contributed 11.20% and 7.30%, respectively.

[8] Beginning January 1, 2015, the employer and employee contributions are 11.50% and 8.00%, respectively.

[9] Estimated Payroll

Schedule of Employer Contributions**

Retiree Medical Plan*

Year Beginning January 1:	Annual Required Contribution (ARC)		Contributions *		Percentage of ARC Contributed
	% of Payroll[9]	Amount	% of Payroll[9]	Amount[1]	[(5)/(3)]
(1)	(2)	(3)	(4)	(5)	(6)
2005[2]	0.61%	$3,032,638	0.71%	$3,530,326	116.41%
2006	0.82%	4,081,627	0.82%	4,075,768	99.86%
2007	0.79%	3,929,333	0.90%	4,504,640	114.64%
2008	0.83%	4,532,574	0.78%	4,253,783	93.85%
2009	0.91%	5,156,984	0.81%	4,551,097	88.25%
2010[3]	0.85%	4,290,712	0.58%	2,924,858	68.17%
2011[4]	0.96%	4,965,060	0.81%	4,202,033	84.63%
2012[5]	1.00%	5,153,185	0.82%	4,241,292	82.30%
2013[6]	0.89%	4,721,761	0.78%	4,135,064	87.57%
2014[7]	0.76%	4,093,763	0.80%	4,332,376	105.83%
2015[8]	0.76%	4,322,064	0.77%	4,380,107	101.34%
2016	0.72%	4,253,678	N/A	N/A	N/A

*Figures prior to 2008 were provided by the previous actuary.

**These liabilities represent solely the value of the explicit benefit, without regard to the implicit rate subsidy. The explicit benefit is valued in compliance with all the parameters established by GASB Statements No. 43 and No.45. The value of any implicit rate subsidy in the city-sponsored health plans will be illustrated in the disclosures related to those plans.

[1] Employers made contributions based on the legally required rates.

[2] Beginning on January 1, 2005, the employers and employees contributed 8.50% and 2.50%, respectively.

[3] Beginning on January 1, 2010, the employers and employees contributed 8.50% and 4.50%, respectively.

[4] Beginning on January 1, 2011, the employers and employees contributed 9.50% and 5.50%, respectively.

[5] Beginning on January 1, 2012, the employers and employees contributed 10.25% and 6.25%, respectively.

[6] Beginning on January 1, 2013, the employers and employees contributed 11.00% and 7.00%, respectively and amortization method changed from level dollar 30-year open to level percent of pay 30-year closed bases.

[7] Beginning on January 1, 2014, the employers and employees contributed 11.20% and 7.30%, respectively.

[8] Beginning January 1, 2015, the employer and employee contributions are 11.50% and 8.00%, respectively.

[9] Estimated Payroll

Notes to Required Supplementary Information

The information presented in the required supplementary schedules was determined as part of the actuarial valuation at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation Date	January 1, 2016
Actuarial Cost Method	Projected Unit Credit
Amortization Method	Level Percent of Pay, Annually Established 30-year Closed Bases
Equivalent Single Amortization Period	27.5 years
Valuation Asset Method	Smoothed Market
Actuarial Assumptions:	
Investment Rate of Return *	7.75%
Projected Salary Increase *	3.25% to 7.25%
Payroll Growth *	3.25%
** Includes Price Inflation at*	2.75%
Cost-of-Living Adjustments	Ad-Hoc Only

SECTION E

PARTICIPANT DATA

Retirees, Beneficiaries and Disabled Reconciliation (Pension Only)

Valuation Date January 1	No. Added to Rolls	No. Removed from Rolls	Rolls End of Year No.	Rolls End of Year Annual Benefits
2007			6,396	$97,109,973
2008	477	-259	6,614	$101,802,055
2009	474	-215	6,873	$109,243,231
2010	733	-183	7,423	$124,695,435
2011	410	-227	7,606	$130,319,793
2012	457	-287	7,776	$138,317,723
2013	540	-271	8,045	$146,837,873
2014	658	-221	8,482	$159,503,726
2015	597	-264	8,815	$169,735,929
2016	560	-301	9,074	$179,304,283

Age and Service Distribution
January 1, 2016
(Pension Only)

Nearest Whole Age	Whole Years of Service at Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Number	Active Payroll
Less than 20	2							2	$ 28,053
20-24	174							174	6,384,760
25-29	654	54	2					710	31,973,972
30-34	694	226	44	2				966	51,519,195
35-39	550	275	157	72	1			1,055	63,666,779
40-44	372	239	193	218	49	1		1,072	71,121,955
45-49	338	228	192	299	247	48	3	1,355	94,990,568
50-54	261	162	157	273	244	149	64	1,310	94,858,960
55-59	186	169	139	206	173	118	85	1,076	78,238,611
60-64	97	94	88	129	104	65	93	670	51,466,690
65-69	30	44	22	55	31	11	13	206	15,925,243
70 & Over	5	6	12	4	9	2	2	40	3,141,425
Totals	**3,363**	**1,497**	**1,006**	**1,258**	**858**	**394**	**260**	**8,636**	**$ 563,316,210**

Historical Summary of Active Member Data*
(Pension Only)

	Active Members		Covered Payroll		Average Payroll		Average	
1-Jan	Number	% Increase	$ Amount	% Increase	$ Amount	% Increase	Age	Service
2001	10,821		$501,841,985		$46,377			
2002	10,098	(6.7%)	503,694,300	0.4%	49,881	7.6%	43.1	9.6
2003	9,537	(5.6%)	491,635,701	(2.4%)	51,550	3.3%	43.7	10.0
2004	8,868	(7.0%)	467,911,855	(4.8%)	52,764	2.4%	44.1	10.4
2005	8,634	(2.6%)	460,341,857	(1.6%)	53,317	1.0%	44.8	10.9
2006	8,732	1.1%	475,500,445	3.3%	54,455	2.1%	45.3	11.2
2007	8,988	2.9%	489,447,759	2.9%	54,456	0.0%	45.4	11.2
2008	9,304	3.5%	543,728,238	11.1%	58,440	7.3%	45.4	11.0
2009	9,323	0.2%	564,986,660	3.9%	60,601	3.7%	45.5	11.0
2010	8,604	(7.7%)	506,045,186	(10.4%)	58,815	(2.9%)	45.7	11.2
2011	8,403	(2.3%)	517,398,105	2.2%	61,573	4.7%	46.2	11.7
2012	8,149	(3.0%)	517,396,257	(0.0%)	63,492	3.1%	46.3	11.9
2013	8,175	0.3%	531,559,017	2.7%	65,023	2.4%	46.4	11.8
2014	8,304	1.6%	540,229,189	1.6%	65,057	0.1%	45.9	11.3
2015	8,489	2.2%	568,562,500	5.2%	66,976	3.0%	45.5	10.9
2016	8,636	1.7%	586,819,180	3.2%	67,950	1.5%	45.1	10.6

* This schedule does not include participants in DROP and DROP II.

Summary of Membership Data by Category
(Pension Only)

	January 1	
	2016	**2015**
Active Members:		
Number	8,636	8,489
Average age (years)	45.1	45.5
Average service (years)	10.6	10.9
Average covered payroll	$67,950	$66,976
Total covered payroll supplied, annualized	$586,819,180	$568,562,500
Vested Inactive Members:		
Number	3,464	3,466
Average age (years)	50.70	50.72
Total annual deferred benefits	$23,472,323	$22,466,308
Average annual deferred benefit	$6,776	$6,482
Nonvested Inactive Members:		
Number	2,233	1,951
Average age (years)	44.85	45.88
Contribution account balance	$6,110,912	$4,333,011
Service Retirees:*		
Number	7,664	7,421
Average age (years)	69.53	69.38
Total annual benefits	$160,862,662	$151,915,392
Average annual benefit	$20,989	$20,471
Disability Retirees:		
Number	311	317
Average age (years)	65.13	64.77
Total annual benefits	$4,771,127	$4,780,211
Average annual benefit	$15,341	$15,080
Beneficiaries:		
Number	1,099	1,077
Average age (years)	69.00	68.91
Total annual benefits	$13,670,494	$13,040,326
Average annual benefit	$12,439	$12,108

**Includes 36 former spouses for 2015 and 43 former spouses for 2016 under domestic relations orders.*

Membership Data Reconciliation
(Pension Only)

	Actives	Disability	Terminated Vested	Terminated Nonvested	Retiree	Beneficiary	Total
GRS Counts as of January 1, 2015	8,489	317	3,466	1,951	7,421	1,077	**22,721**
Actives (Rehires)	**35**		(21)	(14)			
Disability	(4)	**9**	(1)		(4)		
Terminated Vested	(215)		**215**				
Terminated Nonvested	(439)		(4)	**444**		(1)	
Retiree	(317)		(145)		**462**		
Beneficiary							
No Liability (Refunded)	(8)		(45)	(315)	(14)	(4)	
Deceased	(12)	(15)	(2)		(211)	(56)	
New Beneficiaries						83	
New Participants	1,107			167			
Data Correction			1		10		
GRS Counts as of January 1, 2016	**8,636**	**311**	**3,464**	**2,233**	**7,664**	**1,099**	**23,407**
Continuing	**7,494**	**302**	**3,248**	**1,622**	**7,192**	**1,016**	**20,874**

SECTION F

METHODS & ASSUMPTIONS

Valuation Methods-Liabilities

***Actuarial Cost Method* - The Projected Unit Credit (PUC) Cost Method** was used in the valuation.

The Projected Unit Credit Cost Method develops a normal cost and an accrued liability based on the benefit accrued as of the valuation date.

The normal cost is the present value of the benefits that accrue during the year. The benefit accrued during the year is the retirement benefit based on pay projected to a member's retirement date, based on service accrued as of the valuation date. The actuarial accrued liability is the present value of benefits allocated to service prior to the valuation date.

Finally, for all funding methods, the total present value of benefits is equal to the accrued liability plus the present value of future normal costs.

***Financing of Unfunded Actuarial Accrued Liabilities* -** Unfunded Actuarial Accrued Liabilities (full funding credit if assets exceed liabilities) were amortized by level (principal & interest combined) percent of pay contributions over a reasonable period of future years.

Deferred Retirement Option Plan (DROP) and DROP II – The DROPs are closed and no new members are assumed to enter either of the two DROPs. For members who were in DROP and remained employed upon their exit from the DROP program, their accrued liability is calculated as the value of their deferred benefit based on compensation and service earned before their DROP participation plus the value of their additional benefit earned based on compensation and service accrued after their DROP participation ended, as well as their accrued DROP balance. Further detail describing the DROPs can be found in the Plan Provisions, Section G of this report.

Benefits Limited to Maximums Specified in Internal Revenue Code (IRC) – Benefits in pay status are limited to the maximum specified by Section 415 of the IRC, as adjusted annually. The benefits in pay status are limited to the maximum compensation permitted by Section 401(a)(17) of the IRC.

Valuation Methods-Assets

***Actuarial Value of Assets* –** The Actuarial Value of Assets recognizes 20% of the difference between the projected actuarial value and the market value at the valuation date. This method has the effect of smoothing volatility in investment returns. Returns are measured net of all administrative and investment expenses.

Actuarial Standards of Practice Statement #44 provides some guidance in the selection of a method for determining the actuarial value of assets. In particular, when considering utilizing an asset method other than the market value of assets, the method should be selected that is designed to produce actuarial values of assets that bear a reasonable relationship to the corresponding market values. The qualities of the DERP asset value method should include:

The actuarial value of assets should sometimes be greater than, and sometimes less than, the market value of assets. The method employed in the DERP valuation does produce asset values which are sometimes greater than, and sometimes less than the market value of assets.

The asset values fall within a sufficiently narrow range around the corresponding market values.

Development of Amortization Payment

Determination of UAAL Contribution Rate

The unfunded accrued liability as of January 1, 2016 is calculated as of the beginning of the fiscal year for which contributions are being made.

The unfunded accrued liability is amortized over the appropriate period to determine the amortization payment. This payment is divided by the projected fiscal year payroll to determine the amortization payment as a percentage of active member payroll.

Effective January 1, 2013, the funding policy for the development of the annual amortization payment was changed from 30-year open to year-by-year 30-year closed. An amortization base will be established each year and each base will be paid off over 30 years, using annual payments determined as a level percentage of payroll. Each base and full payment schedule is shown in the Appendix.

Valuation Assumptions

The actuarial assumptions used in the valuation are shown in this Section. Both the economic and demographic assumptions were based on an Experience Study performed as of January 1, 2013, and adopted for the January 1, 2013 valuation report. The discount rate was changed effective October 1, 2015, from 8.00% to 7.75%.

A. ***Demographic Assumptions***

Mortality rates were adjusted to include margin for future longevity improvement as described below.

1. Post-Retirement and Beneficiary Mortality Table: *This table shows the probability of dying after leaving employment either as a vested terminated member, a retiree or a beneficiary of a deceased member.*
    a. Male: RP-2000 Combined Mortality Table for males projected with Scale AA to 2020
    b. Female: RP-2000 Combined Mortality Table for females projected with Scale AA to 2020 with a multiplier of 90%

	% Dying Within Next Year Non-Disabled	
Ages	**Men**	**Women**
50	0.15%	0.11%
55	0.25%	0.21%
60	0.49%	0.41%
65	0.96%	0.79%
70	1.64%	1.36%
75	2.85%	2.15%
80	5.26%	3.59%

2. Disabled Mortality Table: *This table shows the probability of dying at sample attained ages.*
    a. Male: RP-2000 Disabled Life Mortality Table for males projected with Scale AA to 2020
    b. Female: RP-2000 Disabled Life Mortality Table for females projected with Scale AA to 2020

	% Dying Within Next Year Disabled	
Ages	**Men**	**Women**
50	2.01%	0.82%
55	2.41%	1.41%
60	3.05%	1.98%
65	3.78%	2.54%
70	4.63%	3.40%
75	6.19%	4.45%
80	8.95%	6.28%

3. Active Mortality: *This table for active members shows the probability of dying before retirement or termination of employment. 15% of the deaths are assumed to be duty-related and 85% are assumed to be non-duty related.*
    a. Male: RP-2000 Combined Mortality Table for males projected with Scale AA to 2020 with a multiplier of 85%
    b. Female: RP-2000 Combined Mortality Table for females projected with Scale AA to 2020 with a multiplier of 85%

	% Dying Within Next Year Non-Disabled	
Ages	**Men**	**Women**
20	0.02%	0.01%
25	0.03%	0.01%
30	0.03%	0.02%
35	0.06%	0.03%
40	0.08%	0.04%
45	0.10%	0.07%
50	0.13%	0.10%

4. Rates of Disability: *15% of the disabilities are assumed to be duty-related and 85% are assumed to be non-duty related.*

	% Becoming Disabled Within Next Year	
Ages	**Duty**	**Non-Duty**
20	0.00%	0.02%
25	0.00%	0.02%
30	0.00%	0.02%
35	0.00%	0.03%
40	0.01%	0.06%
45	0.02%	0.11%
50	0.04%	0.23%
55	0.07%	0.37%
60	0.10%	0.57%
65	0.15%	0.85%

5. Rates of Separation from Active Membership: *Rates do not apply to members eligible to retire and do not include separation on account of death or disability. Inactive members are assumed to retire at the earliest eligible age. If an inactive member is not vested, the liability valued is equal to their employee contributions plus interest. Rates are not applied after the member is eligible for reduced or unreduced retirement benefits.*

Non Hospital		
	Select Period	
Years of Service	% of Active Members Separating Within Next Year	
	Men	Women
1	15.97%	19.84%
2	13.73%	17.11%
3	11.81%	14.76%
4	10.15%	12.72%
5	8.73%	10.97%
6	7.51%	9.46%
7	6.46%	8.16%
8	5.55%	7.04%
9	4.77%	6.07%

Non Hospital		
	Ultimate Rates	
	% of Active Members Separating Within Next Year*	
Ages	Men	Women
25	6.25%	9.00%
30	5.50%	7.75%
35	4.75%	6.50%
40	4.00%	5.50%
45	3.25%	4.50%
50	2.50%	3.50%
55	1.90%	2.70%
60	1.90%	2.70%
64	1.90%	2.70%

*Members with 10 or more years of service

Hospital		
	% of Active Members Separating Within Next	
Ages	Men	Women
30	14.84%	15.41%
35	12.92%	11.91%
40	10.72%	8.40%
45	7.97%	5.60%
50	4.40%	5.60%
55	1.10%	5.60%
60	1.10%	5.60%
64	1.10%	5.60%

6. Rates of Retirement: *This table for active members shows the probability of eligible members retiring during the next year.*

Non Hospital		
	Percent of Eligible Active Members Retiring Within Next Year	
Ages	**Early Retirement**	**Normal Retirement**
55	2.50%	N/A
56	2.75%	N/A
57	3.00%	N/A
58	3.25%	N/A
59	3.50%	N/A
60	3.75%	N/A
61	4.00%	N/A
62	10.00%	N/A
63	10.00%	N/A
64	10.00%	N/A
65	N/A	20.00%
66	N/A	18.00%
67	N/A	18.00%
68	N/A	18.00%
69	N/A	18.00%
70	N/A	100.00%

Hospital		
	Percent of Eligible Active Members Retiring Within Next Year	
Ages	**Early Retirement**	**Normal Retirement**
55	2.50%	N/A
56	2.75%	N/A
57	3.00%	N/A
58	3.25%	N/A
59	3.50%	N/A
60	3.75%	N/A
61	4.00%	N/A
62	10.00%	N/A
63	10.00%	N/A
64	10.00%	N/A
65	N/A	20.00%
66	N/A	18.00%
67	N/A	18.00%
68	N/A	18.00%
69	N/A	18.00%
70	N/A	18.00%
71	N/A	18.00%
72	N/A	18.00%
73	N/A	18.00%
74	N/A	18.00%
75	N/A	100.00%

	Percent of Eligible Active Members Retiring Within Next Year
Ages	**Rule of 75 Retirement**
NAR*	22.00%
NAR+1	14.00%
NAR+2	14.00%
NAR+3	14.00%
NAR+4	14.00%
NAR+5	14.00%
NAR+6	18.00%
NAR+7	22.00%
NAR+8	26.00%
NAR+9	30.00%
NAR+10	30.00%

*NAR, Normal Age at Retirement, is defined as the first age at which a member is eligible to retire under the Rule of 75 with a minimum age of 55 (or Rule of 85 with a minimum age of 60 if hired after July 1, 2011) (Refer to Section G). After attainment of age 70 (age 75 for the Hospital group), or NAR +11, the retirement rate assumption is 100.00%.

B. *Economic Assumptions*

1. Investment Return Rate: 7.75% per annum, compounded annually, net of investment and administrative expenses.
2. Cost of Living Increases: 0.00% per annum
3. Inflation Rate: 2.75% per annum
4. Real Rate of Return: 5.00% per annum
5. The Rates of Salary Increase: *Assumed salary increases for active members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.*

Non Hospital

	% Increase in Salary for the Year		
Sample Ages	**Merit and Seniority**	**Base (Economic)***	**Increase for the Year**
20	4.00%	3.25%	7.25%
25	3.50%	3.25%	6.75%
30	2.50%	3.25%	5.75%
35	2.00%	3.25%	5.25%
40	1.25%	3.25%	4.50%
45	0.50%	3.25%	3.75%
50	0.00%	3.25%	3.25%
55	0.00%	3.25%	3.25%
60	0.00%	3.25%	3.25%
65	0.00%	3.25%	3.25%

Hospital

	% Increase in Salary for the Year		
Sample Ages	**Merit and Seniority**	**Base (Economic)***	**Increase for the Year**
30	0.00%	3.25%	3.25%
35	0.00%	3.25%	3.25%
40	0.00%	3.25%	3.25%
45	0.00%	3.25%	3.25%
50	0.00%	3.25%	3.25%
55	0.00%	3.25%	3.25%
60	0.00%	3.25%	3.25%
65	0.00%	3.25%	3.25%

**Salary increases shown include wage inflation of 3.25% per annum.*

C. Miscellaneous and Technical Assumptions

Administrative & Investment Expenses	The investment return assumption is intended to be the return net of investment and administrative expenses.
Benefit Service	Exact fractional service is used to determine the amount of benefit payable.
COLA	None assumed.
Covered Payroll	Annual payroll projected forward with one year's salary increase.
Death after termination but before Retirement (or Continuation)	A load of 0.7% (1.3% for members hired after January 1, 2010) is added to the vested terminated benefit to account for the benefit paid to the spouse if the participant dies before retirement.
Decrement Operation	All decrements other than withdrawal are in force during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
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.
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.
Marriage Assumption	75% of males and 60% of females are assumed to be married for purposes of death-in-service benefits and 75% of males and 60% of females are assumed to be married for purposes of retiree medical benefits. Male spouses are assumed to be the same age as female spouses for active member valuation purposes.
Normal Form of Benefit	A straight life annuity is the normal form of benefit.
Pay Increase Timing	Beginning of year. This is equivalent to assuming that reported pays represent annualized rates of pay on the valuation date.
Service Credit Accruals	It is assumed that members accrue one year of service credit per year.
Split of Member and Employer Contributions	For the Schedule of Employer Contributions the member and employer contributions are split between the pension and medical funds based on their respective ratios to the Total Computed Contribution Rate developed in the previous year's actuarial valuation.

Terminal Pay	For members hired prior to January 1, 2010, unused sick and vacation hours are converted into pay at retirement, death, disability or termination. That converted amount is included in the Final Average Compensation (FAC). The valuation accounts for this by assuming the FAC will be increased by 5.00% for active retirement benefits and increased by 2.25% for active ordinary death and termination benefits for members hired prior to January 1, 2010.
Retiree Medical Election Percentage	It is assumed that 85% of members who retire elect medical benefits, 30% of members who terminate elect medical benefits, 80% of beneficiaries elect medical benefits, and 80% of members who leave as disabled members elect retiree medical benefits.

SECTION G

PLAN PROVISIONS

Plan Provisions

A. Ordinances	Amended and Restated under Denver Municipal Code Section 18-391 through 18-430.7. Most recently amended under Ordinance No. 15-0591, adopted September 2015.
B. Effective Date	January 1, 1963
C. Plan Year	January 1 through December 31
D. Type of Plan	Qualified, 401(a) governmental defined benefit retirement plan; for GASB purposes it is a multi-employer cost sharing plan.
E. Eligibility Requirements	Elected Officials, Appointed Officials, and Employees as defined in Denver Municipal Code Sections 18-402 and 18-406.
F. Credited Service	Service measured in months from date of employment to date of retirement or prior termination.
G. Compensation	*Gross pay, compensation and salary* shall mean that amount of remuneration, including wages, salaries, other amounts received for personal services actually rendered in the course of employment with the employer, and other amounts actually included or that could be included in gross income of and due to an employee, including employees on disability leave as provided for in division 4 of article V of chapter 18 of the Denver Municipal Code, or otherwise, from the employer in the full amount as calculated before any reductions or deductions are made for any purpose, including reductions or deductions by reason of sections 125, 132(f)(4) or 457 of the Internal Revenue Code, but not including distributions made from a plan of the employer designed to be eligible under section 457. Employer provided fringe benefits receiving special tax benefits, such as premiums for group term life insurance (to the extent excludible from gross income), shall be excluded from the definition of compensation. The calendar year shall be the limitation year (determination period) for purposes of section 415 of the Internal Revenue Code.
H. Final Average Compensation (FAC)	Average monthly rate of compensation during the highest 36 (60 for members hired on or after July 1, 2011) successive calendar months of covered service.
I. Normal Retirement	1. Eligibility: For employees hired prior to July 1, 2011, attainment of age 65, or attainment of age 55 with age plus credited service equal to 75. For Employees hired July 1, 2011 or after, attainment of age 65 with 5 years of service, or attainment of age 60 with age plus credited service equal to 85. 2. Benefit: 1.5% (2.0% if hired before September 1, 2004) of FAC times credited service. 3. Normal Form: straight life annuity.

J. Early Retirement

1. Eligibility: Attainment of age 55 (60 for members hired on or after July 1, 2011) and completion of 5 years.
2. Benefit: Benefit accrued to date of retirement, reduced by 3% (6% for members hired on or after July 1, 2011) per year from age 65 to reflect commencement of benefit at an earlier age.

K. Temporary Early Retirement

Pending approval of a disability application, a retirement benefit is available to an active, vested member who is at least age 55 or age 60, if hired on or after July 1, 2011. This benefit is designed to provide income to the member during the process of fulfilling the disability application requirements. There is a three year limit on this retirement benefit.

L. Deferred Retirement

1. Eligibility: Any vested employee who terminates service for any reason other than retirement, disability, or death and leaves their accumulated contributions on deposit in the trust fund.
2. Benefit: Based on the formula in effect at the time of separation from service. Payment may commence any month after the member's 55th birthday, if hired prior to July 1, 2011, or after the member's 60th birthday, if hired July 1, 2011 or later.

M. Service Connected Disability

1. Eligibility: Any employee who becomes totally and permanently disabled as defined in Denver Municipal Code Section 18-408(d) which arises out of and in the course of the member's employment with the employer.
2. Benefit: Based on the greater of 20 years of service or actual service plus 10 years. Total credited service cannot exceed the credited service the member would have earned at age 65.
3. Normal Form: straight life annuity.

N. Non-Service Connected Disability

1. Eligibility: Any vested employee who becomes totally and permanently disabled as defined in Denver Municipal Code Section 18-408(e) which does not occur as a result of a service connected disability.
2. Benefit: The higher of 75% of the amount calculated for a service-connected disability or the amount calculated for an early retirement.
3. Normal Form: straight life annuity.

O. Death in the Line of Duty

The active member's surviving spouse is awarded the retirement benefit the member would have been entitled at their normal retirement date based on the higher of 15 years of service or actual credited service plus 5 years. Total credited service cannot exceed the credited service the member would have earned at age 65. If there is no surviving spouse but the member has children under age 21, then the benefit shall be paid until the youngest child becomes age 21. If there is no surviving spouse and no children under age 21, then the benefit shall be paid to a designated beneficiary.

P. Other Pre-Retirement Death

The active member's surviving spouse is awarded 75% of the benefit that would have been entitled had the death been service connected. If an active member who has attained the age of fifty-five (55) or the age of sixty (60) if hired on or after July 1, 2011 dies prior to the actual retirement date, the member shall be deemed to have retired on the first day of the month following the month in which death occurs and the surviving spouse will receive an annuity as if the member had elected the 100% joint and survivor option if this will result in a greater benefit to the spouse than the above provision.

Q. Post-Retirement Death

1. For Normal Retirement (with at least 5 years of service), Disability Retirement (after age 65), and for Temporary Early Retirement (pending approval of disability) the lump-sum death benefit is $5,000.
2. For Disability Retirement before age 65, the death benefit is 150% of the member's annualized average monthly salary, limited to $50,000. This benefit reduces to $5,000 upon the disabled member reaching age 65.
3. If hired prior to July 1, 2011, for Early Retirement the lump-sum at age: 64 is $4,750; 63 is $4,500; 62 is $4,250; 61 is $4,000; 60 is $3,750; 59 is $3,500; 58 is $3,250; 57 is $3,000; 56 is $2,750; 55 is $2,500.
4. If hired on or after July 1, 2011, for Early Retirement the lump-sum at age: 64 is $4,500; 63 is $4,000; 62 is $3,500; 61 is $3,000; 60 is $2,500.

R. Optional Forms

Joint and Survivor Option - Any employee retiring under the normal retirement provision may elect a joint and survivor benefit. The member's benefit is actuarially reduced based on their election: 100%, 75%, or 50%. Once the benefit commences this election cannot be changed. If the spouse or designated beneficiary predeceases the member, the benefit paid to the member shall be increased to the full single straight life annuity as if no joint and survivor benefit had been selected.

S. Medical Benefits

Retiree Medical Plan Benefits – Participants and their surviving spouses or dependents receiving retirement benefits are eligible to elect to receive plan-provided retiree medical coverage and a plan-provided subsidy (benefit) to help provide for the payment of health insurance premiums. The Plan contributes $6.25 per month for each year of service for members who are Medicare eligible. The Plan contributes $12.50 per month for each year of service for members not eligible for Medicare. In the event of the election of a Joint and Survivor option, the benefit is calculated based on the age of the member. If the member predeceases the joint and survivor beneficiary then the full benefit is transferred to the surviving spouse or dependent regardless of the joint and survivor election percentage. The monthly benefit is limited to the monthly premium amount for the coverage elected. If a member dies and leaves a beneficiary who is not a spouse or dependent, that beneficiary can elect to participate in the group health plan, but must pay the full cost. No plan contribution can be made for non-spouse or non-dependent beneficiaries.

T. Refunds	1. Eligibility: All members leaving covered employment with less than 5 years of service are eligible. Vested members (those with 5 or more years of service) may not withdraw their accumulated contributions plus interest in lieu of the deferred benefits otherwise due. 2. Benefit: The member who withdraws receives a lump-sum payment of his/her employee contributions, plus the interest credited on these contributions. Interest is credited at 3.00%.
U. Member Contributions	8.00% of compensation, effective January 1, 2015.
V. Employer Contributions	11.50% of compensation, effective January 1, 2015 for each member.
W. Cost of Living Increases	Given on an ad-hoc basis. There have been no cost of living increases since 2002.
X. Changes from Previous Valuation	There have been no changes in the plan provisions since the previous actuarial valuation, except for those specified herein.
Y. Deferred Retirement Option Plan	1. DROP – From January 1, 2001 through April 30, 2003, in lieu of immediate termination of employment and receipt of a normal retirement benefit, eligible members were permitted to continue employment for four years and have their normal retirement benefit paid into the deferred retirement option plan (DROP) account, after which time the participant either terminated employment or continued to be employed and resume regular membership with the retirement plan. 2. DROP II – From May 1, 2003 through September 1, 2003, in lieu of immediate termination of employment and receipt of a normal retirement benefit, eligible members were permitted to continue employment for five years and have their normal retirement benefit paid into the DROP II account after which time all participants terminated employment.
Z. Other Ancillary Benefits	Social Security Make-Up Benefit – For members hired before July 1, 2011 and retiring on or after January 1, 1996, an additional retirement benefit equal to the applicable percentage (per Denver Municipal Code Section 18-409(i)) of the member's estimated primary Social Security benefit multiplied by credited service with the City/DHHA during which the contributions were made to Social Security (up to a maximum of 35 years of credited service) divided by 35. This additional benefit is payable beginning on the first day of the month after the member's 62nd birthday or the member's retirement date, whichever is later, but will not be paid before retirement benefits have begun from the Plan. Members retiring under a disability form of retirement are not eligible for this benefit.

SECTION H

GLOSSARY

Glossary

Actuarial Accrued Liability (AAL)	The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs. The total present value of benefits is the sum of the AAL and the Present Value of Future Normal Costs.
Actuarial Assumptions	Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; 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 items.
Actuarial Cost Method	A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability.
Actuarial Equivalent	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value	The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made.
Actuarial Present Value of Future Benefits	The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members entitled to either 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 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 No. 25, such as the Funded Ratio and the Annual Required Contribution (ARC).
Actuarial Value of Assets	The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC). The actuarial value of assets is the asset amount used to determine the unfunded accrued liability, the funded ratio and the ARC

Glossary

Amortization Method	A method for determining the Amortization Payment. The choices are level dollar and level percentage of payroll; and open period versus closed period. 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 rate at which total covered payroll of all active members is assumed to increase. For an open amortization method (either level dollar or level percent of pay), the amortization period does not decline each year. Thus, at the end of a given period, an open amortization period may still have a remaining UAAL balance.
Amortization Payment	That portion of the plan contribution or ARC which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability. As a special note, it is possible that an open method level percent of pay payment may not pay off principal in early years.
Amortization Period	The period used in calculating the Amortization Payment.
Annual Required Contribution (ARC)	Originally described under GASB 25, the employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation. The ARC consists of the Employer Normal Cost and Amortization Payment. For Section D, the ARC is defined to be the sum of (a) the employer normal cost, and (b) the amount needed to amortize the UAAL as a level dollar amount over 30 years.
Closed Amortization Period	A specific number of years that is reduced by one each year, and 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.
Employer Normal Cost	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Equivalent Single Amortization Period	For plans that do not establish separate amortization bases (separate components of the UAAL), this is the same as the Amortization Period. For plans that do establish separate amortization bases, this is the period over which the UAAL would be amortized if all amortization bases were combined upon the current UAAL payment.

Glossary

Experience Gain/Loss	A measure of the liability difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two actuarial valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the 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, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected.
Funded Ratio	The ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability.
GASB	Governmental Accounting Standards Board.
GASB No. 25 and GASB No. 27	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. 27 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 25 sets the rules for the systems themselves.
GASB No. 43 and GASB No. 45	These are the governmental accounting standards that set the accounting rules for postemployment benefits other than pensions for the public retirement systems and employers that sponsor or contribute to them. Statement No. 43 sets the accounting rules for the employers, while Statement No. 45 sets the rules for the systems themselves
Normal Cost	The annual cost assigned, under the Actuarial Cost Method, to the current plan year.
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.
Select Period for Separation Rates	A select period sets separation rates for an employee's first "select" years of service. After the employee works beyond the select period, then the ultimate separation rates are used based on the employee's age.
Unfunded Actuarial Accrued Liability	The difference between the Actuarial Accrued Liability and Actuarial Value of Assets.
Valuation Date	The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date.

SECTION I

OTHER SPECIAL REQUIREMENTS

Determination of DHHA Supplemental Contributions

Determination of DHHA Supplemental Contributions – Pension Plan

	2016	2015
Average Age for Active Members at Hospital	53.34	52.68
Number of Active Members at Hospital	512	557
Average Age for Active Members Non-Hospital	44.55	44.99
Number of Active Members Non-Hospital	8,124	7,932
Normal Cost for Hospital	$7,577,492	$7,647,400
Estimated Payroll for Hospital	51,353,645	52,686,009
Normal Cost as a Percent of Hospital Payroll	14.76%	14.52%
Normal Cost for Non-Hospital	$52,171,487	$52,074,904
Estimated Payroll for Non-Hospital	535,465,534	515,876,490
Normal Cost as a Percent of Non-Hospital Payroll	9.74%	10.09%
Difference in Normal Cost as a Percent of Payroll	5.02%	4.33%
Estimated Payroll for Hospital	$51,353,645	$52,686,009
Difference in Normal Cost as a Dollar Amount	$2,577,953	$2,333,990

Determination of DHHA Supplemental Contributions – Retiree Medical Plan

	2016	2015
Average Age for Active Members at Hospital	53.34	52.68
Number of Active Members at Hospital	512	557
Average Age for Active Members Non-Hospital	44.55	44.99
Number of Active Members Non-Hospital	8,124	7,932
Normal Cost for Hospital	$259,484	$275,406
Estimated Payroll for Hospital	51,353,645	52,686,009
Normal Cost as a Percent of Hospital Payroll	0.50529%	0.52273%
Normal Cost for Non-Hospital	$2,355,175	$2,408,830
Estimated Payroll for Non-Hospital	535,465,534	515,876,490
Normal Cost as a Percent of Non-Hospital Payroll	0.43984%	0.46694%
Difference in Normal Cost as a Percent of Payroll	0.065451%	0.055792%
Estimated Payroll for Hospital	$51,353,645	$52,686,009
Difference in Normal Cost as a Dollar Amount	$33,612	$29,395
Total Difference in Normal Cost as a Dollar Amount	**$2,611,565**	**$2,363,385**

APPENDIX

AMORTIZATION SCHEDULES

Amortization Schedule of 2016 Base Year UAAL

		Pension		Retiree Medical	
Year	Years Remaining	Amortization Payment	Remaining Base	Amortization Payment	Remaining Base
		(1)	(2)	(3)	(4)
2016	30	$3,647,853	$63,055,926	$70,667	$1,221,535
2017	29	3,766,408	64,012,199	72,964	1,240,060
2018	28	3,888,817	64,914,839	75,335	1,257,546
2019	27	4,015,203	65,755,539	77,784	1,273,833
2020	26	4,145,697	66,525,212	80,311	1,288,743
2021	25	4,280,432	67,213,927	82,922	1,302,085
2022	24	4,419,546	67,810,841	85,617	1,313,648
2023	23	4,563,182	68,304,119	88,399	1,323,204
2024	22	4,711,485	68,680,860	91,272	1,330,503
2025	21	4,864,608	68,927,002	94,238	1,335,271
2026	20	5,022,708	69,027,229	97,301	1,337,213
2027	19	5,185,946	68,964,871	100,463	1,336,005
2028	18	5,354,489	68,721,791	103,728	1,331,296
2029	17	5,528,510	68,278,268	107,100	1,322,703
2030	16	5,708,187	67,612,864	110,580	1,309,813
2031	15	5,893,703	66,702,289	114,174	1,292,173
2032	14	6,085,248	65,521,252	117,885	1,269,294
2033	13	6,283,019	64,042,294	121,716	1,240,643
2034	12	6,487,217	62,235,618	125,672	1,205,644
2035	11	6,698,052	60,068,903	129,756	1,163,670
2036	10	6,915,738	57,507,092	133,973	1,114,042
2037	9	7,140,500	54,512,183	138,328	1,056,024
2038	8	7,372,566	51,042,989	142,823	988,817
2039	7	7,612,174	47,054,881	147,465	911,559
2040	6	7,859,570	42,499,516	152,258	823,311
2041	5	8,115,006	37,324,542	157,206	723,060
2042	4	8,378,744	31,473,275	162,315	609,708
2043	3	8,651,053	24,884,357	167,590	482,066
2044	2	8,932,212	17,491,385	173,037	338,847
2045	1	9,222,509	9,222,509	178,661	178,661
2046	0		-		-

Amortization Schedule of 2015 Base Year UAAL

		Pension		Retiree Medical	
Year	Years Remaining	Amortization Payment	Remaining Base	Amortization Payment	Remaining Base
		(1)	(2)	(3)	(4)
2015	30	$6,683,062	$115,521,828	$155,594	$2,689,556
2016	29	6,900,261	117,273,770	160,650	2,730,344
2017	28	7,124,520	118,927,456	165,872	2,768,845
2018	27	7,356,067	120,467,663	171,262	2,804,704
2019	26	7,595,139	121,877,745	176,828	2,837,533
2020	25	7,841,981	123,139,508	182,575	2,866,909
2021	24	8,096,845	124,233,085	188,509	2,892,370
2022	23	8,359,993	125,136,799	194,636	2,913,410
2023	22	8,631,693	125,827,008	200,961	2,929,479
2024	21	8,912,223	126,277,952	207,493	2,939,978
2025	20	9,201,870	126,461,574	214,236	2,944,253
2026	19	9,500,931	126,347,331	221,199	2,941,593
2027	18	9,809,711	125,901,996	228,388	2,931,225
2028	17	10,128,527	125,089,437	235,810	2,912,307
2029	16	10,457,704	123,870,381	243,474	2,883,925
2030	15	10,797,579	122,202,160	251,387	2,845,086
2031	14	11,148,500	120,038,436	259,557	2,794,711
2032	13	11,510,827	117,328,906	267,993	2,731,628
2033	12	11,884,928	114,018,980	276,702	2,654,567
2034	11	12,271,189	110,049,441	285,695	2,562,149
2035	10	12,670,002	105,356,067	294,980	2,452,879
2036	9	13,081,777	99,869,235	304,567	2,325,135
2037	8	13,506,935	93,513,485	314,466	2,177,162
2038	7	13,945,911	86,207,058	324,686	2,007,055
2039	6	14,399,153	77,861,386	335,238	1,812,753
2040	5	14,867,125	68,380,557	346,133	1,592,022
2041	4	15,350,307	57,660,722	357,383	1,342,445
2042	3	15,849,192	45,589,473	368,998	1,061,405
2043	2	16,364,290	32,045,153	380,990	746,069
2044	1	16,896,130	16,896,130	393,372	393,372
2045	0		-		-

Amortization Schedule of 2014 Base Year UAAL

		Pension		Retiree Medical	
Year	Years Remaining	Amortization Payment	Remaining Base	Amortization Payment	Remaining Base
		(1)	(2)	(3)	(4)
2014	30	$829,516	$13,967,932	$6,308	$106,216
2015	29	834,894	14,189,489	6,349	107,901
2016	28	862,028	14,389,576	6,555	109,423
2017	27	890,044	14,575,933	6,768	110,840
2018	26	918,971	14,746,545	6,988	112,137
2019	25	948,837	14,899,211	7,215	113,298
2020	24	979,674	15,031,528	7,450	114,304
2021	23	1,011,514	15,140,873	7,692	115,136
2022	22	1,044,388	15,224,384	7,942	115,771
2023	21	1,078,331	15,278,946	8,200	116,186
2024	20	1,113,376	15,301,163	8,466	116,355
2025	19	1,149,561	15,287,340	8,742	116,249
2026	18	1,186,922	15,233,457	9,026	115,840
2027	17	1,225,497	15,135,142	9,319	115,092
2028	16	1,265,325	14,987,643	9,622	113,970
2029	15	1,306,448	14,785,797	9,935	112,436
2030	14	1,348,908	14,523,998	10,257	110,445
2031	13	1,392,747	14,196,160	10,591	107,952
2032	12	1,438,012	13,795,677	10,935	104,906
2033	11	1,484,747	13,315,384	11,290	101,254
2034	10	1,533,001	12,747,512	11,657	96,936
2035	9	1,582,824	12,083,635	12,036	91,888
2036	8	1,634,266	11,314,623	12,427	86,040
2037	7	1,687,379	10,430,585	12,831	79,317
2038	6	1,742,219	9,420,805	13,248	71,639
2039	5	1,798,841	8,273,676	13,679	62,915
2040	4	1,857,304	6,976,634	14,123	53,052
2041	3	1,917,666	5,516,078	14,583	41,946
2042	2	1,979,990	3,877,289	15,056	29,484
2043	1	2,044,340	2,044,340	15,546	15,546
2044	0		-		-

Amortization Schedule of 2013 Base Year UAAL

		Pension		Retiree Medical	
Year	Years Remaining	Amortization Payment	Remaining Base	Amortization Payment	Remaining Base
		(1)	(2)	(3)	(4)
2013	30	$36,403,533	$612,986,163	$3,913,241	$65,893,671
2014	29	37,586,648	622,709,240	4,040,421	66,938,865
2015	28	37,856,818	631,932,400	4,069,463	67,930,319
2016	27	39,087,164	640,116,440	4,201,721	68,810,072
2017	26	40,357,497	647,609,045	4,338,277	69,615,499
2018	25	41,669,116	654,313,543	4,479,271	70,336,206
2019	24	43,023,362	660,124,370	4,624,847	70,960,848
2020	23	44,421,621	664,926,337	4,775,155	71,477,041
2021	22	45,865,324	668,593,831	4,930,347	71,871,283
2022	21	47,355,947	670,989,966	5,090,583	72,128,858
2023	20	48,895,015	671,965,656	5,256,027	72,233,741
2024	19	50,484,103	671,358,616	5,426,848	72,168,487
2025	18	52,124,836	668,992,287	5,603,221	71,914,115
2026	17	53,818,894	664,674,678	5,785,325	71,449,989
2027	16	55,568,008	658,197,108	5,973,349	70,753,675
2028	15	57,373,968	649,332,855	6,167,482	69,800,802
2029	14	59,238,622	637,835,701	6,367,926	68,564,901
2030	13	61,163,877	623,438,353	6,574,883	67,017,241
2031	12	63,151,703	605,850,748	6,788,567	65,126,641
2032	11	65,204,133	584,758,220	7,009,195	62,859,275
2033	10	67,323,268	559,819,529	7,236,994	60,178,461
2034	9	69,511,274	530,664,721	7,472,196	57,044,430
2035	8	71,770,390	496,892,839	7,715,043	53,414,082
2036	7	74,102,928	458,069,438	7,965,782	49,240,715
2037	6	76,511,273	413,723,915	8,224,670	44,473,740
2038	5	78,997,890	363,346,621	8,491,971	39,058,374
2039	4	81,565,321	306,385,758	8,767,960	32,935,299
2040	3	84,216,194	242,244,021	9,052,919	26,040,307
2041	2	86,953,220	170,274,984	9,347,139	18,303,910
2042	1	89,779,200	89,779,200	9,650,921	9,650,921
2043	0		-		-