City of Austin Employees' Retirement System

Actuarial Valuation Report for the Year Ending December 31, 2017

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April 24, 2018

Mr. Christopher Hanson
Executive Director
City of Austin Employees' Retirement System
418 E. Highland Mall Blvd.
Austin, TX 78752

Dear Mr. Hanson:

Subject: **Actuarial Valuation as of December 31, 2017**

We are pleased to present our report on the actuarial valuation of the City of Austin Employees' Retirement System (COAERS or the System). This report describes the current actuarial condition of COAERS, determines the period over which the unfunded liabilities of the System are expected to be paid off and determines the funded status of the System.

In addition, the report provides various summaries of the data. A separate report is issued with regard to valuation results determined in accordance with Governmental Accounting Standards Board (GASB) Statements 67 and 68. Results of this report should not be used for any other purpose without consultation with the undersigned. Valuations are prepared annually as of December 31st, the last day of the COAERS plan year. This report was prepared at the request of the Board and is intended for use by the COAERS staff and those designated or approved by the Board. This report may be provided to parties other than COAERS staff only in its entirety and only with the permission of the Board.

As you know, the employee and employer contribution rates are set by statute. It is expected that these contribution rates will remain level as a percentage of payroll. The System's funding policy is for the contribution rates to be sufficient to cover the normal cost of the plan and to amortize any unfunded actuarial accrued liabilities over a period not to exceed 25 years.

Currently, the total contribution rate is sufficient to amortize the System's unfunded liabilities in approximately 30 years. Therefore, the Board's funding policy is not currently being met. As of the prior valuation, the total contribution rate was sufficient to amortize the unfunded liabilities in 31 years. The decrease in the funding period is primarily due to an increase in the active membership and the corresponding increase in covered payroll.

In 2010 the City of Austin adopted the Amended Supplemental Funding Plan (ASFP). The ASFP provides for an additional City contribution rate of up to a maximum of 10.0% above the base 8.0% rate. The City is now contributing an additional 10.0%, or a total rate of 18.0%. The additional contribution rate is intended to stay in place until the ASFP is amended or repealed.

We certify that the information presented herein is accurate and fairly portrays the actuarial position of COAERS as of December 31, 2017. All of the supporting schedules and tables contained in this actuarial valuation report were prepared by GRS Retirement Consulting (GRS), including various

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accounting and statistical tables which should help you compare the results of this plan year with prior years. The information presented in the trend data schedules of this report has been prepared by GRS. The information for years 1993 through 2000 was prepared by Watson Wyatt & Company.

The following schedules in the actuarial section of the COAERS Comprehensive Annual Financial Report were prepared by GRS: Summary of Cost Items, Analysis of Normal Cost by Component, Actuarial Present Value of Future Benefits and Calculation of Actuarial Accrued Liability, Development of Actuarial Value of Assets, Change in Net Position, Change in Unfunded Actuarial Accrued Liability, Relative Size of Unfunded Actuarial Accrued Liability, Schedule of Active Member Valuation Data, Schedule of Retirees and Beneficiaries Added to and Removed from Rolls, Solvency Test, Schedule of Funding Progress.

GRS provided COAERS with the information used in preparing the following trend schedules in the financial section of the CAFR: Notes to the Financial Statements - Schedule of Net Pension Liability, and Sensitivity of the Net Pension Liability to Changes in the Discount Rate; Required Supplementary Information - Schedule of Changes in the Net Pension Liability and Related Ratios. GRS provided no additional assistance in the preparation of any other schedules in the financial section of the CAFR. These schedules were provided to COAERS in a separate GASB report.

As authorized under Article 6243n of the Vernon's Civil Statutes of the State of Texas, actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary. An experience investigation was performed for the five year period ending December 31, 2015. As a result of that study, revised assumptions were adopted by the Board effective with the valuation as of December 31, 2015. We believe the assumptions are internally consistent, reasonable, and, where appropriate, based on the actual experience of COAERS. All of the assumptions and methods used in this valuation were selected in compliance with the Actuarial Standards of Practice.

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 funding periods. Due to the limited scope of this assignment, GRS did not perform an analysis of the potential range of such possible future differences. The actuarial calculations are intended to provide information for rational decision making.

Member data for retired, active and inactive participants was supplied as of December 31, 2017, by the COAERS staff. We have not subjected this data to any auditing procedures, but have examined the data for reasonableness and consistency with the prior year's data. Asset information was also supplied by the COAERS staff.

The last actuarial valuation of COAERS was prepared as of December 31, 2016 by GRS. Valuations are prepared annually as of December 31st.

The undersigned are independent actuaries and consultants. Mr. Falls is an Enrolled Actuary and a Member of the American Academy of Actuaries and he meets the Qualification Standards of the American Academy of Actuaries. Both Mr. Falls and Mr. Ward are experienced in performing valuations for large public retirement systems.

We would like to thank you and your staff for your assistance in providing all necessary information to complete this valuation. Your courteous help is very much appreciated. We look forward to discussing this actuarial valuation report with you at your convenience. Please do not hesitate to let us know if you have any questions or need additional information.

Sincerely,

Lewis Ward

Lewis Ward
Consultant

R. Ryan Falls, F.S.A, E.A., M.A.A.A.
Senior Consultant

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SECTION A

EXECUTIVE SUMMARY

Executive Summary

The key results from the valuation of the City of Austin Employees' Retirement System as of December 31, 2017 may be summarized as follows:

	December 31, 2017 (1)	December 31, 2016 (2)
• Members		
— Actives	9,612	9,364
— Retirees (including disabled) and beneficiaries	6,225	5,934
— Vested - terminated	964	981
— Total	16,801	16,279
• Covered payroll	$ 629,943,122	$ 599,574,934
• Normal cost as % of payroll*	17.73%	18.01%
• Actuarial accrued liability	$ 3,797,823,303	$ 3,591,376,306
• Actuarial value of assets	$ 2,592,460,631	$ 2,423,269,015
• Unfunded actuarial accrued liability (UAAL)	$ 1,205,362,672	$ 1,168,107,291
• Estimated yield on assets		
— Actuarial value basis	8.10%	5.74%
— Market value basis	16.48%	8.03%
• Contribution rate		
— Employee	8.00%	8.00%
— Employer	18.00%	18.00%
• Benefit and refund payments	$ 190,332,179	$ 179,128,881
• Amortization period of unfunded actuarial accrued liability	30 years	31 years
• Funding Policy employer contribution rate	19.33%	19.61%
• Funded ratio	68.3%	67.5%
• Funded ratio using market value of assets	69.8%	64.0%

* Includes 0.51% of payroll for administrative expenses beginning in December 31, 2015 valuation.

SECTION B

DISCUSSION

Introduction

This December 31, 2017 actuarial valuation of the City of Austin Employees' Retirement System has been prepared by GRS Retirement Consulting. The primary purpose of the valuation is to value the liabilities of the System as of December 31, 2017, determine the funding period of any unfunded liability for the plan year beginning January 1, 2018, and to provide certain required disclosure information. We are pleased to have the privilege of working for the Board, and look forward to discussing the results with you at your convenience.

Pages B-2 and B-3 of this report provides the current funded status of the plan and reviews the valuation results. Assets are discussed on page B-4, while page B-5 contains an analysis of the actuarial gains and losses during the past year.

Page B-6 discusses some of the historical comparisons and statistical summaries for the plan. Page B-7 provides a summary of the valuation results along with other comments.

Various tables supporting the report are contained in Sections C and D. Section E describes the actuarial methods and assumptions used in the valuation, and Section F outlines the Plan's benefit provisions, including any changes since the last valuation. Finally, Section G provides definitions of terms used throughout this report.

Funded Status of the Plan

The funded status of the plan is shown in Table 1, Table 2, and Table 3. Table 1 summarizes the various cost items from the current year's and prior year's actuarial valuations, while Table 2 provides an allocation of the normal cost by its various components. Table 3 shows the components of the actuarial liability.

Reviewing the composition of normal cost of the System, Table 2 indicates that the employer normal cost as of December 31, 2017, is 17.73% of pay. This compares with 18.01% of pay as of the last valuation on December 31, 2016. This normal cost is developed based on the Individual Entry Age Normal (EAN) actuarial cost method. As may be seen in Item 1, the normal cost for the retirement benefits is 14.10% of pay. The normal cost for the deferred termination benefits is 1.06% and 1.38% for refunds of terminated employees (both vested and non-vested). The normal cost for disability benefits is 0.20%, and the normal cost for death benefits is 0.48%. In addition, the cost of anticipated administrative expenses is being added to the normal cost rate. This adds 0.51% of pay to the normal cost rate as of December 31, 2017. The decline in the average normal cost reflects the continued shift in the active membership from Group A to Group B. We expect this pattern of declining normal costs (as a percentage of payroll) to continue until the active population is mostly Group B.

Table 1 illustrates a number of the key actuarial items for the 2017 valuation. As mentioned above, the total normal cost rate is 17.73% of covered payroll. The actuarial accrued liability is $3,797.8 million as shown in Item 5 and as detailed in Table 3. The actuarial value of assets equals $2,592.5 million, as shown in Item 6. Item 7 of Table 1 shows that the plan has an $1,205.4 million unfunded liability (i.e. liabilities exceed plan assets) as of the valuation date. As of the last valuation (December 31, 2016), the System was underfunded by $1,168.1 million. The increase in the unfunded liability is described in greater detail on page B-5 and Table 6.

On October 1, 2012, the City began contributing 18% of payroll and the employees are contributing 8% of payroll. Combining the employees' contributions with the City contribution, the System will have 26.00% of payroll to fund benefits. The current normal cost of the plan is 17.73%, which means that the System is currently receiving contributions in excess of the normal cost equal to 8.27% of pay (26.00% less 17.73%). These excess contributions are available to amortize any unfunded actuarial accrued liability. Based on these contribution rates, if all assumptions are exactly met then the current unfunded liability will be fully amortized over the next 30 years.

Funded Status of the Plan
(Continued)

The actuarial valuation report as of December 31, 2017 reveals that the funded ratio (the ratio of actuarial assets to actuarial accrued liability) is 68.3%. On a market value of asset basis the funded status is 69.8%. The funded status is one of many metrics used to show trends and develop future expectations about the health of the System. The funded status measure itself is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations or assessing the need for or the amount of future contributions since it does not reflect normal cost contributions, the timing of amortization payments, or future experience other than expected.

Under the Amended Supplemental Funding Plan (ASFP) the total City contribution rate is 18.0% of pay. The additional contribution is intended to stay in place until the ASFP is amended or repealed.
The normal cost was determined using the Individual Entry Age Normal (EAN) actuarial cost method. This method determines the normal cost for all employees on an individual basis, based on the benefits applicable to each individual member. Because employees hired on or after January 1, 2012 (Group B) have a less valuable benefit tier than employees hired prior to that date (Group A), the normal cost for Group B is less than the normal cost of Group A. With the application of the Individual EAN method, the normal cost is equal to the average of the individual members' normal costs. Since the current group of employees is primarily Group A, this means that the average normal costs for the group will decline over time as Group B employees replace Group A employees.

Because the contributions to the System are a fixed percentage of payroll, this means that the percentage of payroll that will go to pay off the unfunded liability will increase in the future as the average normal cost decreases. This result makes it difficult to calculate the funding period using a mathematical formula since the amount of contributions to pay off the unfunded liability will not be either a constant dollar amount or a constant percentage of payroll in the future. For this reason we are using an open group projection to determine when the System is expected to pay off its unfunded liability. The open group projection assumes a constant active population and that there will be no actuarial gains or losses on liabilities or the actuarial value of assets. Based on the open group projection the funding period of the System as of the valuation date is 30 years.

Change in Assets

Table 4 shows the development of the actuarial value of assets. Item 11 of Table 4, shows that the actuarial value of assets as of December 31, 2017 is $2,592.5 million. Table 4 also shows the development of the gain/(loss) on the actuarial value of assets for the prior plan year. As shown in Item 12, the System had a gain on an actuarial asset basis of $14.5 million in 2017. This compares to the $41.1 million loss in 2016.

The method for determining the actuarial value of assets offsets excesses or shortfalls in the current year's investment income dollar for dollar against prior years' deferred gains or losses. Any remaining amounts from the current or prior years continue to be recognized over a five-year period. The investment income exceeded the assumed 7.50% rate of return on a market value of assets (MVA) basis. As shown in column 2 of Table 4, this excess investment income fully offset the prior years' deferred shortfalls in investment income. In addition, $72.5 million in excess income remained 20% of which ($14.5 million) is recognized in this year's actuarial value of assets with the remainder deferred for future valuations.

The total deferral of all Excess/(Shortfall) investment income for the year (shown in Table 4, Column 6 of Item 8) is $58.0 million.

An analysis of the change in the System's market value of assets for the last two plan years and an estimate of the return on assets for the System are included in Table 5. The estimated average annual rate of return for the year ending December 31, 2017, assuming that income, revenue, and expenditures are evenly distributed throughout the year is 16.48% on a market value of assets basis. The rate of return for the year ending December 31, 2017, on an actuarial value basis was 8.03%. This compares with the actuarial assumed investment return at the beginning of the year of 7.50%.

Actuarial Gains and Losses

An important part of the change in unfunded actuarial accrued liability from year to year is due to the impact of actuarial gains and losses of the System. This section summarizes the combined asset and liability experience changes since the prior valuation on December 31, 2016.

As can be seen in Item 7 of Table 6, the expected value of the unfunded actuarial accrued liability as of December 31, 2017, was an underfunded position of $1,202.7 million. This expected value reflects an assumed investment return assumption of 7.50% on the beginning of year unfunded actuarial accrued liability, normal cost, and contributions during 2017.

Since the actual unfunded actuarial accrued liability as of December 31, 2017 is $1,205.4 million, it represents a total unexpected net increase for the period of $2.6 million, as shown in Item 9 of Table 6. That is, the unfunded actuarial accrued liability is greater than expected. The net increase in the unfunded actuarial accrued liability includes an asset gain of $14.5 million as shown in Table 4, and an unexpected increase on the liability side equal to $17.1 million, which is broken out by source in Items 15-22 of Table 6.

Please see Section E for a more detailed description of the assumptions and methods.

Historical Comparisons and Statistical Summaries

Various statistical data on the System is shown in the tables contained in Section D. In addition, Tables 7 through 10 of Section C contain certain actuarial trend information which may be of interest.

Table 7 relates the size of the unfunded actuarial accrued liability (UAAL) to three different measurements. In Columns 3 and 4 the UAAL is related to the covered payroll of the System. Columns 5 and 6 relate the UAAL to the actuarial value of assets, while Columns 7 and 8 relate the UAAL to the total actuarial liabilities of the System.

Tables 8 through 10 provide information which should be included in your annual report. Table 8 provides a schedule of active member valuation data. Table 9 provides a schedule of retirees and beneficiaries added to and removed from payment rolls. Solvency test results are presented in Table 10.

Summary and Closing Comments

It is our opinion that the results of this valuation provide a reasonable reflection of the funded status of the System. The System's contributions are currently sufficient to amortize the unfunded liability of the System.

As previously mentioned, in 2010 the City of Austin adopted an Amended Supplemental Funding Plan (ASFP) which provides for an additional contribution from the City, above the 8.0% base rate, which has resulted in a gradual increase the City's total contribution rate to the System to 18.0%. This additional contribution is intended to remain in place until the ASFP is either amended or repealed.

The overall funded position of the System increased from 67.5% at the prior valuation to 68.3% at this valuation. Using an open group projection, we have determined that the System is expected to be fully funded in 30 years, assuming all valuation assumptions are realized in the future. The decrease in the funding period is primarily due to an increase in active membership and the corresponding increase in covered payroll. Because the payroll base is larger, we are now expecting larger future contributions towards the unfunded liability than in the prior year. Of course these projections could change with the addition of any unfunded liabilities (such as cost of living adjustments) or if there is a significant downturn in the financial markets.

SECTION C

ACTUARIAL TABLES

Actuarial Tables

Table 1
Summary of Cost Items

	December 31, 2017		December 31, 2016	
	Cost Item	Cost as % of Pay	Cost Item	Cost as % of Pay
	(1)	(2)	(3)	(4)
1. Participants				
a. Active	9,612		9,364	
b. Terminated vested	964		981	
c. Retired participants and beneficiaries	6,116		5,822	
d. Disabled	109		112	
e. Total	16,801		16,279	
2. Covered Payroll	$ 629,943,122		$ 599,574,934	
3. Averages for Active Participants				
a. Average age	44.9		45.0	
b. Average years of service	9.4		9.4	
c. Average pay	$ 65,537		$ 64,030	
4. Total Normal Cost				
a. Normal Cost Rate	17.22%		17.50%	
b. Administrative Expenses	0.51%		0.51%	
c. Total	17.73%		18.01%	
5. Actuarial Accrued Liability				
a. Active participants	$ 1,712,224,107		$ 1,642,806,001	
b. Terminated vested participants	67,799,224		66,281,482	
c. Refunds of terminated nonvested participants	10,694,535		9,251,513	
d. Retired participants and beneficiaries	1,987,299,166		1,853,906,622	
e. Disabled participants	19,806,271		19,130,688	
f. Total	$ 3,797,823,303	602.88%	$ 3,591,376,306	598.99%
6. Actuarial Value of Assets	$ 2,592,460,631	411.54%	$ 2,423,269,015	404.16%
7. Unfunded Actuarial Accrued Liability (UAAL)	$ 1,205,362,672	191.34%	$ 1,168,107,291	194.82%
8. Relative Size of UAAL				
a. As percent of actuarial value of assets	46.49%		48.20%	
b. As percent of covered payroll	191.34%		194.82%	
9. Funding period using open group projection	30		31	
10. Employer contribution rate to satisfy funding policy*	19.33%		19.61%	

* employer rate that produces fully funded plan in 25-years in open group projection

Table 2
Analysis of Normal Cost by Component

Benefit Component	Cost as % of Pay	
	December 31, 2017	December 31, 2016
(1)	(2)	(3)
1. Retirement Benefits	14.10%	14.41%
2. Termination - Deferred Benefits	1.06%	1.08%
3. Termination - Refund Benefits	1.38%	1.34%
4. Disability Benefits	0.20%	0.19%
5. Death Benefits	0.48%	0.48%
6. Administrative Expenses	0.51%	0.51%
7. Normal Cost	17.73%	18.01%

Table 3
Actuarial Present Value of Future Benefits and Calculation of Actuarial Accrued Liability

	December 31, 2017 (1)	December 31, 2016 (2)
A. Present Value of Future Benefits		
1. Active participants		
a. Retirement benefits	$ 2,340,048,470	$ 2,259,029,975
b. Deferred termination benefits	87,649,687	85,420,239
c. Refund of contributions terminations	56,829,069	50,184,142
d. Disability benefits	16,162,004	14,987,500
e. Death benefits	58,706,177	56,424,009
f. Total	$ 2,559,395,407	$ 2,466,045,865
2. Retired participants		
a. Service retirements and beneficiaries	$ 1,987,299,166	$ 1,853,906,622
b. Disability retirements	19,806,271	19,130,688
c. Total	$ 2,007,105,437	$ 1,873,037,310
3. Inactive participants		
a. Vested terminations with deferred benefits	$ 67,799,224	$ 66,281,482
b. Nonvested terminations with refunds payable	10,694,535	9,251,513
c. Total	$ 78,493,759	$ 75,532,995
4. Total actuarial present value of future benefits	$ 4,644,994,603	$ 4,414,616,170
B. Normal Cost Rate (including administrative expenses)	17.73%	18.01%
C. Present Value of Future Normal Costs	$ 847,171,300	$ 823,239,864
D. Actuarial Accrued Liability for Active Members		
1. Present value of future benefits (Item A.1.f)	$ 2,559,395,407	$ 2,466,045,865
2. Less present value of future normal costs (Item C)	847,171,300	823,239,864
3. Actuarial accrued liability	$ 1,712,224,107	$ 1,642,806,001
E. Total Actuarial Accrued Liability (Item A.2.c + Item A.3.c + Item D.3)	$ 3,797,823,303	$ 3,591,376,306

Table 4
Development of Actuarial Value of Assets

		Year Ending December 31, 2017
1. Actuarial value of assets at beginning of year	$	2,423,269,015
2. Net new investments		
a. Contributions	$	167,040,174
b. Benefits and refunds paid		(190,332,179)
c. Administrative expenses		(2,778,290)
d. Subtotal	$	(26,070,295)
3. Assumed investment return rate for fiscal year		7.50%
4. Expected net investment income	$	180,767,540
5. Expected actuarial value at end of year (Item 1+ Item 2 + Item 4)	$	2,577,966,260
6. Market value of assets at end of year	$	2,650,438,116
7. Difference (Item 6 - Item 5)	$	72,471,856

8. Development of amounts to be recognized as of December 31, 2017:

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)
2013	$ 0	$ 0	$ 0	1	$ 0	$ 0
2014	0	0	0	2	0	0
2015	(122,462,263)	122,462,263	0	3	0	0
2016	(1,118,366)	1,118,366	0	4	0	0
2017	196,052,485	(123,580,629)	72,471,856	5	14,494,371	57,977,485
Total	$ 72,471,856	$ 0	$ 72,471,856		$ 14,494,371	$ 57,977,485

9. Preliminary actuarial value of plan assets, end of year (Item 5 + Item 8: Column 5)	$	2,592,460,631
10. Actuarial value of assets corridor		
a. 80% of market value, end of year	$	2,120,350,493
b. 120% of market value, end of year	$	3,180,525,739
11. Final actuarial value of plan net assets, end of year (Item 9, but recognize 1/3 of any deferred gains or losses outside of Item 10)	$	2,592,460,631
12. Asset gain (loss) for year (Item 11 - Item 5)	$	14,494,371
13. Asset gain (loss) as % of final actuarial value of assets		0.56%
14. Ratio of actuarial value to market value		97.8%

Notes: Remaining deferrals in Column (1) for prior years are from Column (6) in last year's report. The number in the current year is the difference between the remaining deferrals for prior years and Item 7 (which is the difference between the market value of assets and the expected actuarial value of assets). Column 2 is a direct offset of the current year's excess/(shortfall) return against prior years' excess/(shortfall) of the opposite type.

Table 5
Change in Net Position

		Valuation Period Ending December 31, 2017 (1)	Valuation Period Ending December 31, 2016 (2)
1.	Assets in plan at beginning of year **(A)**	$ 2,299,688,386	$ 2,144,804,122
2.	Employer contributions	110,846,582	104,272,793
3.	Employee contributions	56,193,592	60,801,253
4.	Benefit payments made*	186,286,855	175,218,095
5.	Refunds of contributions	4,045,324	3,910,786
6.	Expenses paid from trust	2,778,290	2,700,917
7.	Investment expense	5,687,391	4,781,660
8.	Investment return	382,507,416	176,421,676
9.	Assets in plan at end of year **(B)** (1 + 2 + 3 - 4 - 5 - 6 - 7 + 8)	$ 2,650,438,116	$ 2,299,688,386
10.	Approximate rate of return on average invested assets		
	a. Net investment income (8 - 7 = **I**)	$ 376,820,025	$ 171,640,016
	b. Estimated yield based on **(2I/(A + B - I))**	16.48%	8.03%

* Benefit payments exclude any distributions from the 415 Restoration Plan

Table 6
Change in Unfunded Actuarial Accrued Liability as of December 31, 2017

CALCULATION OF TOTAL ACTUARIAL GAIN OR LOSS	2017	2016
1. Unfunded actuarial accrued liability (UAAL) as of prior year	$ 1,168,107,291	$ 1,083,708,976
2. Actual normal cost paid during year (includes service purchases)	115,956,014	118,920,262
3. Subtotal (1 + 2)	$ 1,284,063,305	$ 1,202,629,238
4. Interest at prior valuation's rate of 7.50%	91,956,397	85,737,683
5. Contributions during year	(167,040,174)	(165,074,046)
6. Interest on contributions for one-half year	(6,264,007)	(6,190,277)
7. Expected UAAL as of December 31st (3 + 4 + 5 + 6)	$ 1,202,715,521	$ 1,117,102,598
8. Actual UAAL as of December 31st	1,205,362,672	1,168,107,291
9. Unexpected Change in UAAL for the period (8 - 7)	$ 2,647,151	$ 51,004,693
SOURCE OF CHANGE IN UAAL		
10. Asset (gain)/loss (See Table 4)	$ (14,494,371)	$ 41,100,346
11. Total unanticipated increase/(decrease) in liabilities for the period (9-10)	17,141,522	9,904,347
12. Increase/(decrease) due to benefit enhancements	0	0
13. Increase/(decrease) due to assumption & method changes	0	0
14. Liability experience (gain)/loss (11 - 12 - 13)	$ 17,141,522	$ 9,904,347
SOURCE OF LIABILITY (GAINS) AND LOSSES		
15. Salary Increases	$ (3,049,050)	$ 4,580,328
16. Service Retirement	(2,383,543)	(8,416,978)
17. Withdrawal	4,523,214	3,455,296
18. Disability Retirement	(20,028)	(74,347)
19. Active Mortality	689,417	784,778
20. Retiree Mortality	3,438,647	(2,412,086)
21. Rehires	2,518,641	2,447,155
22. Other (Data) including proportionate program	11,424,224	9,540,201
23. Total Liability Experience (Gain)/Loss	$ 17,141,522	$ 9,904,347

Table 7
Relative Size of Unfunded Actuarial Accrued Liability

		Relative to Covered Payroll		Relative to Actuarial Value of Present Assets		Relative to Total Actuarial Accrued Liability	
Valuation as of 31-Dec	Unfunded/ (Overfunded) Actuarial Accrued Liability	Covered Payroll	Percent of Covered Payroll	Present Assets	Percent of Present Assets	Actuarial Accrued Liability	Percent of Actuarial Accrued Liability
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1998	(74,816,812)	219,326,742	(34.1%)	952,634,480	(7.9%)	877,817,668	(8.5%)
1999	(60,632,797)	244,538,110	(24.8%)	1,105,121,657	(5.5%)	1,044,488,860	(5.8%)
2000	(18,353,201)	268,635,564	(6.8%)	1,230,971,746	(1.5%)	1,212,618,545	(1.5%)
2001	48,980,941	316,793,390	15.5%	1,311,288,668	3.7%	1,360,269,609	3.6%
2002	189,347,298	322,007,672	58.8%	1,250,851,348	15.1%	1,440,198,646	13.1%
2003	203,040,300	312,790,966	64.9%	1,348,790,502	15.1%	1,551,830,802	13.1%
2004	321,383,795	326,590,164	98.4%	1,356,797,448	23.7%	1,678,181,243	19.2%
2005	395,382,953	348,619,141	113.4%	1,398,798,722	28.3%	1,794,181,675	22.0%
2006	476,226,660	390,963,991	121.8%	1,497,783,958	31.8%	1,974,010,618	24.1%
2007	459,277,808	417,450,797	110.0%	1,653,533,484	27.8%	2,112,811,292	21.7%
2008	765,526,422	448,740,469	170.6%	1,481,377,439	51.7%	2,246,903,861	34.1%
2009	658,466,636	422,539,199	155.8%	1,672,470,344	39.4%	2,330,936,980	28.2%
2010	749,087,565	438,877,002	170.7%	1,711,577,229	43.8%	2,460,664,794	30.4%
2011	932,942,173	451,831,198	206.5%	1,790,902,641	52.1%	2,723,844,815	34.3%
2012	1,070,656,825	470,231,969	227.7%	1,897,722,867	56.4%	2,968,379,692	36.1%
2013	861,988,246	490,553,170	175.7%	2,047,929,504	42.1%	2,909,917,750	29.6%
2014	900,174,491	539,158,693	167.0%	2,193,881,221	41.0%	3,094,055,712	29.1%
2015	1,083,708,976	559,829,504	193.6%	2,308,087,140	47.0%	3,391,796,116	32.0%
2016	1,168,107,291	599,574,934	194.8%	2,423,269,015	48.2%	3,591,376,306	32.5%
2017	1,205,362,672	629,943,122	191.3%	2,592,460,631	46.5%	3,797,823,303	31.7%

Table 8
Schedule of Active Member Valuation Data

Year Ending 31-Dec	Active Participants	Percent Change	Covered Payroll	Percent Change	Average Salary	Percent Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1998	6,311	-7.2%	219,326,742	0.1%	34,753	7.8%
1999	6,512	3.2%	244,538,110	11.5%	37,552	8.1%
2000	6,894	5.9%	268,635,564	9.9%	38,967	3.8%
2001	7,713	11.9%	316,793,390	17.9%	41,073	5.4%
2002	7,647	-0.9%	322,007,672	1.6%	42,109	2.5%
2003	7,432	-2.8%	312,790,966	-2.9%	42,087	-0.1%
2004	7,489	0.8%	326,590,164	4.4%	43,609	3.6%
2005	7,638	2.0%	348,619,141	6.7%	45,643	4.7%
2006	8,055	5.5%	390,963,991	12.1%	48,537	6.3%
2007	8,358	3.8%	417,450,797	6.8%	49,946	2.9%
2008	8,643	3.4%	448,740,469	7.5%	51,920	4.0%
2009	8,142	-5.8%	422,539,199	-5.8%	51,896	0.0%
2010	8,270	1.6%	438,877,002	3.9%	53,069	2.3%
2011	8,348	0.9%	451,831,198	3.0%	54,124	2.0%
2012	8,387	0.5%	470,231,969	4.1%	56,067	3.6%
2013	8,592	2.4%	490,553,170	4.3%	57,094	1.8%
2014	9,028	5.1%	539,158,693	9.9%	59,721	4.6%
2015	9,063	0.4%	559,829,504	3.8%	61,771	3.4%
2016	9,364	3.3%	599,574,934	7.1%	64,030	3.7%
2017	9,612	2.6%	629,943,122	5.1%	65,537	2.4%

Table 9

Schedule of Retirees and Beneficiaries Added to and Removed From Rolls

	Added to Rolls		Removed from Rolls		Rolls-End of Year			
Year Ending December 31	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)
2001	224	5,278,490	95	2,046,233	2,592	65,647,094	7.9%	25,327
2002	309	7,754,803	118	2,534,050	2,783	72,520,159	10.5%	26,058
2003	271	7,706,066	59	1,502,757	2,995	78,596,302	8.4%	26,243
2004	227	5,619,478	85	1,741,624	3,137	82,121,249	4.5%	26,178
2005	258	6,699,023	98	2,438,555	3,297	85,324,686	3.9%	25,879
2006	259	6,788,190	89	1,883,938	3,467	90,312,037	5.8%	26,049
2007	289	8,523,459	123	2,262,126	3,633	96,071,149	6.4%	26,444
2008	290	8,299,468	88	2,056,217	3,835	101,840,870	6.0%	26,556
2009	331	9,953,411	80	1,630,148	4,086	109,656,152	7.7%	26,837
2010	341	10,495,807	92	2,029,423	4,335	117,954,059	7.6%	27,210
2011	324	9,851,119	117	2,785,375	4,542	124,748,580	5.8%	27,466
2012	405	13,035,228	116	3,011,032	4,831	134,653,163	7.9%	27,873
2013	387	12,451,142	98	2,176,950	5,120	144,755,297	7.5%	28,273
2014	397	12,737,257	121	2,568,479	5,396	154,937,553	7.0%	28,713
2015	411	13,547,663	128	2,980,334	5,679	165,579,191	6.9%	29,156
2016	385	12,920,841	130	3,199,901	5,934	175,327,721	5.9%	29,546
2017	422	14,942,887	131	2,979,178	6,225	187,304,849	6.8%	30,089

Table 10
Solvency Test

Valuation Date	Aggregated Accrued Liabilities for: Active and Inactive Members Contributions	Retirees and Beneficiaries	Active and Inactive Members (Employer Financed Portion)	Reported Assets	Portions of Accrued Liabilities Covered by Reported Assets: (5)/(2)	[(5)-(2)]/3	[(5)-(2)-(3)]/(4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
December 31, 2001	248,579,180	654,307,118	457,383,311	1,311,288,668	100.0%	100.0%	89.3%
December 31, 2002	265,812,595	718,187,586	456,198,465	1,250,851,348	100.0%	100.0%	58.5%
December 31, 2003	252,182,701	777,100,825	522,547,276	1,348,790,502	100.0%	100.0%	61.1%
December 31, 2004	261,905,526	812,266,336	604,009,381	1,356,797,448	100.0%	100.0%	46.8%
December 31, 2005	280,994,642	848,185,652	665,001,381	1,398,798,722	100.0%	100.0%	40.5%
December 31, 2006	295,166,238	904,166,079	774,678,301	1,497,783,958	100.0%	100.0%	38.5%
December 31, 2007	333,340,167	968,493,997	810,977,128	1,653,533,484	100.0%	100.0%	43.4%
December 31, 2008	357,423,035	1,025,407,475	864,073,351	1,481,377,439	100.0%	100.0%	11.4%
December 31, 2009	362,288,592	1,109,773,550	858,874,838	1,672,470,344	100.0%	100.0%	23.3%
December 31, 2010	377,651,365	1,195,328,215	887,685,214	1,711,577,229	100.0%	100.0%	15.6%
December 31, 2011	413,944,399	1,267,467,354	1,042,433,062	1,790,902,641	100.0%	100.0%	10.5%
December 31, 2012	417,481,360	1,375,244,710	1,175,653,622	1,897,722,867	100.0%	100.0%	8.9%
December 31, 2013	436,164,975	1,478,146,019	995,606,756	2,047,929,504	100.0%	100.0%	13.4%
December 31, 2014	453,220,166	1,580,320,342	1,060,515,204	2,193,881,221	100.0%	100.0%	15.1%
December 31, 2015	471,000,910	1,771,674,810	1,149,120,396	2,308,087,140	100.0%	100.0%	5.7%
December 31, 2016	497,752,958	1,873,037,310	1,220,586,038	2,423,269,015	100.0%	100.0%	4.3%
December 31, 2017	517,234,871	2,007,105,437	1,273,482,995	2,592,460,631	100.0%	100.0%	5.3%

Table 11
Schedule of Funding Progress

Valuation Date	Actuarial Value of Assets (AVA)	Actuarial Accrued Liability (AAL)	Unfunded Actuarial Accrued Liability (UAAL) (3) - (2)	Funded Ratio (2)/(3)	Annual Covered Payroll	UAAL as % of Payroll (4)/(6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
December 31, 1998	952.6	877.8	(74.8)	108.5%	219.3	(34.1%)
December 31, 1999	1,105.1	1,044.5	(60.6)	105.8%	244.5	(24.8%)
December 31, 2000	1,231.0	1,212.6	(18.4)	101.5%	268.6	(6.8%)
December 31, 2001	1,311.3	1,360.3	49.0	96.4%	316.8	15.5%
December 31, 2002	1,250.9	1,440.2	189.3	86.9%	322.0	58.8%
December 31, 2003	1,348.8	1,551.8	203.0	86.9%	312.8	64.9%
December 31, 2004	1,356.8	1,678.2	321.4	80.8%	326.6	98.4%
December 31, 2005	1,398.8	1,794.2	395.4	78.0%	348.6	113.4%
December 31, 2006	1,497.8	1,974.0	476.2	75.9%	391.0	121.8%
December 31, 2007	1,653.5	2,112.8	459.3	78.3%	417.5	110.0%
December 31, 2008	1,481.4	2,246.9	765.5	65.9%	448.7	170.6%
December 31, 2009	1,672.5	2,330.9	658.5	71.8%	422.5	155.8%
December 31, 2010	1,711.6	2,460.7	749.1	69.6%	438.9	170.7%
December 31, 2011	1,790.9	2,723.8	932.9	65.7%	451.8	206.5%
December 31, 2012	1,897.7	2,968.4	1,070.7	63.9%	470.2	227.7%
December 31, 2013	2,047.9	2,909.9	862.0	70.4%	490.6	175.7%
December 31, 2014	2,193.9	3,094.1	900.2	70.9%	539.2	167.0%
December 31, 2015	2,308.1	3,391.8	1,083.7	68.0%	559.8	193.6%
December 31, 2016	2,423.3	3,591.4	1,168.1	67.5%	599.6	194.8%
December 31, 2017	2,592.5	3,797.8	1,205.4	68.3%	629.9	191.3%

Note: Dollar amount in millions.

SECTION D

STATISTICAL TABLES

The Statistical Section provides additional historical perspective, context, and detail to assist the reader in using the information in the financial statements and note disclosures to understand and assess the economic condition of the City of Austin Employees' Retirement System (COAERS). In compliance with *GASB Statement No. 44, Economic Condition Reporting: The Statistical Section*, schedules are classified into the following categories: Demographic and Economic Information, Operating Information, and Financial Trends.

Statistical Tables

Sources: *Schedules and data are provided by the consulting actuary, GRS Retirement Consulting, unless otherwise noted.*

Table 12A
Distribution of All Active Participants by Age and Length of Service
As of December 31, 2017

Attained Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	Number of Employees	Average Annual Salary
Under 25	80	49	19	15	3	2	0	0	0	0	0	0	168	$ 38,380
25-29	187	186	98	80	73	57	0	0	0	0	0	0	681	45,759
30-34	194	177	140	137	120	256	95	1	0	0	0	0	1,120	53,759
35-39	160	153	106	160	87	325	280	88	5	0	0	0	1,364	61,011
40-44	103	93	74	109	91	295	292	253	47	1	0	0	1,358	68,631
45-49	95	86	57	91	77	293	277	303	146	28	0	0	1,453	70,905
50-54	41	51	36	83	47	246	232	274	195	74	17	0	1,296	72,165
55-59	56	38	40	57	49	191	212	273	144	73	27	2	1,162	72,981
60-64	19	27	22	38	37	133	154	151	72	57	20	7	737	73,581
65 & Over	3	7	6	9	12	60	55	67	27	12	9	6	273	73,696
All Ages	938	867	598	779	596	1,858	1,597	1,410	636	245	73	15	9,612	$ 65,537

Table 12B
Distribution of Group A Active Participants by Age and Length of Service as of December 31, 2017

Attained Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	Number of Employees	Average Annual Salary
Under 25	0	0	0	0	0	0	0	0	0	0	0	0	0	$ 0
25-29	0	0	0	0	0	28	0	0	0	0	0	0	28	52,316
30-34	1	0	1	1	0	184	95	1	0	0	0	0	283	58,847
35-39	0	0	1	2	0	242	280	88	5	0	0	0	618	65,346
40-44	0	0	1	2	6	221	292	253	47	1	0	0	823	72,861
45-49	0	1	0	0	0	228	277	303	146	28	0	0	983	73,989
50-54	0	1	1	1	1	185	232	274	195	74	17	0	981	74,705
55-59	0	0	1	1	1	162	210	273	144	73	27	2	894	75,568
60-64	0	0	1	0	0	108	154	150	72	57	20	7	569	74,789
65 & Over	0	0	0	0	0	50	55	67	26	12	9	6	225	76,125
All Ages	1	2	6	7	8	1,408	1,595	1,409	635	245	73	15	5,404	$ 72,488

Table 12C
Distribution of Group B Active Participants by Age and Length of Service as of December 31, 2017

Attained Age	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30-34	35+	Number of Employees	Average Annual Salary
Under 25	80	49	19	15	3	2	0	0	0	0	0	0	168	$ 38,380
25-29	187	186	98	80	73	29	0	0	0	0	0	0	653	45,477
30-34	193	177	139	136	120	72	0	0	0	0	0	0	837	52,039
35-39	160	153	105	158	87	83	0	0	0	0	0	0	746	57,420
40-44	103	93	73	107	85	74	0	0	0	0	0	0	535	62,126
45-49	95	85	57	91	77	65	0	0	0	0	0	0	470	64,454
50-54	41	50	35	82	46	61	0	0	0	0	0	0	315	64,255
55-59	56	38	39	56	48	30	1	0	0	0	0	0	268	64,349
60-64	19	27	21	38	37	26	0	0	0	0	0	0	168	69,489
65 & Over	3	7	6	9	12	11	0	0	0	0	0	0	48	62,312
All Ages	937	865	592	772	588	450	2	1	1	0	0	0	4,208	$ 56,611

Table 13
Distribution of All Active Participants by Service and Current Rate of Pay as of December 31, 2017

Completed Years of Service	Number of Employees	Total Average Salary
0	938	$ 51,307
1	867	53,451
2	598	55,617
3	779	59,784
4	596	62,172
5-9	1,858	66,505
10-14	1,597	69,121
15-19	1,410	74,999
20-24	636	78,654
25-29	245	85,726
30-34	73	91,250
35+	15	80,012
All Years	9,612	$ 65,537

Table 14
Schedule of Average Benefit Payments

Retirement Effective Dates January 1, 2012 to December 31, 2017	Years Creditable Service 0-4	5-9	10-14	15-19	20-24	25-29	30+
Period 01/01/2012 to 12/31/2012							
Average Monthly Benefit	$263	$890	$1,591	$2,366	$3,158	$4,669	$4,490
Average Final Salary	$41,271	$50,472	$55,358	$57,742	$61,017	$74,302	$60,811
Number of Active Retirees	12	46	52	33	109	73	17
Period 01/01/2013 to 12/31/2013							
Average Monthly Benefit	$249	$701	$1,541	$2,325	$3,330	$4,714	$5,418
Average Final Salary	$38,808	$43,790	$54,621	$57,891	$64,170	$76,055	$71,320
Number of Active Retirees	19	43	43	47	140	46	17
Period 01/01/2014 to 12/31/2014							
Average Monthly Benefit	$304	$934	$1,748	$2,059	$3,457	$4,653	$5,142
Average Final Salary	$41,458	$54,808	$61,215	$55,462	$66,771	$74,120	$70,799
Number of Active Retirees	23	51	50	39	115	56	22
Period 01/01/2015 to 12/31/2015							
Average Monthly Benefit	$342	$826	$1,856	$2,469	$3,650	$4,597	$5,533
Average Final Salary	$45,450	$49,458	$65,657	$66,219	$71,037	$70,821	$76,571
Number of Active Retirees	30	44	49	51	112	54	25
Period 01/01/2016 to 12/31/2016							
Average Monthly Benefit	$205	$1,072	$1,801	$2,320	$3,592	$4,801	$6,625
Average Final Salary	$35,701	$66,456	$64,162	$60,699	$69,051	$75,365	$85,827
Number of Active Retirees	22	43	50	44	108	49	21
Period 01/01/2017 to 12/31/2017							
Average Monthly Benefit	$371	$925	$1,788	$3,032	$3,871	$4,630	$6,037
Average Final Salary	$50,749	$54,135	$61,636	$71,751	$73,301	$74,520	$80,261
Number of Active Retirees	21	43	63	61	114	43	28

Table 15
Retired Members by Type of Benefit (as of December 31, 2017)

Amount of Monthly Benefit	Number of Retired Members	Type of Retirement[a] 1	2	3	4	Option Selected[b] Unmod.	1	2	3	4	5	6	7	8	9
Deferred						964									
$1-250	204	175	9	2	18	121	61	7	4				11		
251-500	287	230	31	12	14	133	103	20	9	4		1	15	2	
501-750	327	259	42	12	14	151	115	23	16	5	4	2	9		2
751-1,000	357	271	56	14	16	146	120	30	24	6	3	13	11	1	3
1,001-1,250	339	261	57	13	8	109	123	26	15	9	11	19	10	1	16
1,251-1,500	393	318	57	15	3	111	155	32	23	6	18	22	12	1	13
1,501-1,750	403	350	44	9	0	113	148	37	31	5	17	24	16	1	11
1,751-2,000	440	383	43	11	3	124	168	49	27	4	23	19	8		18
Over $2,000	3,475	3,293	152	21	9	1,072	1,425	319	231	38	85	86	95	24	100
Total	**6,225**	**5,540**	**491**	**109**	**85**	**3,044**	**2,418**	**543**	**380**	**77**	**161**	**186**	**187**	**30**	**163**

Notes:

[a] Type of Retirement

1. Normal retirement for age and service
2. Beneficiary payment, normal retirement or death in service
3. Disability retirement
4. QDRO - alternate payee

[b] Option Selected:

Unmodified Plan: life annuity

The following options reduce the retired member's monthly benefit:

Option 1 - Beneficiary receives 100 percent of member's reduced monthly benefit
Option 2 - Beneficiary receives 50 percent of member's reduced monthly benefit
Option 3 - Beneficiary receives 66-2/3 percent of member's reduced monthly benefit
Option 4 - Survivor receives 66-2/3 percent of member's reduced monthly benefit upon first death
Option 5 - Level income option payable for life of retiree
Option 6 - Level income option, beneficiary receives 66-2/3 percent of member's monthly benefit
Option 7 - Life annuity with 15 years guaranteed
Option 8 - Other participant created actuarial equivalent forms of payment
Option 9 - Level income option, beneficiary receives 100 percent of member's monthly benefit

*The number of Retired Members and the number of options selected are not equal due to the inclusion of 964 deferred vested members in the Unmodified option selection.

Table 16
Schedule of Participating Employers

The City of Austin and the City of Austin Employees' Retirement System are the only participating employers in the plan.

Table 17
Change in Net Position, Last Ten Fiscal Years

	Fiscal Year									
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Additions										
Member Contributions	$41,263	$38,752	$40,629	$41,503	$43,922	$47,449	$50,489	$54,066	$60,801	$56,194
Employer Contributions	40,786	45,263	53,576	66,718	76,217	86,713	93,470	100,637	104,488	111,058
Investment Income (net of expenses)	(435,867)	310,844	230,102	(21,964)	220,199	287,075	99,704	(47,608)	171,641	376,819
Total additions to plan net assets	(353,818)	394,859	324,307	$86,257	$340,338	$421,237	$243,663	$107,095	$336,930	$544,071
Deductions										
Benefit Payments	100,707	108,090	115,665	123,558	131,606	141,923	152,664	162,085	171,736	183,344
Refunds	4,285	4,858	4,205	3,801	4,916	4,738	4,154	4,052	3,911	4,045
Administrative Expenses	1,883	2,032	2,113	2,218	2,280	2,561	2,631	2,421	2,701	2,778
Lump-sum Payments	3,022	3,095	2,013	2,483	3,843	4,858	5,039	3,532	3,697	3,154
Total deductions from plan net assets	109,897	118,075	123,996	132,060	142,645	154,080	164,488	172,090	182,045	193,321
Change in net assets	($463,715)	$276,784	$200,311	($45,803)	$197,693	$267,157	$79,175	($64,995)	$154,884	$350,750

Notes: Dollar amounts in thousands

Columns may not add due to rounding

Includes contributions to and benefit payments from 415 Restoration Plan

Table 18
Benefit and Refund Deductions from Net Position by Type, Last Ten Fiscal Years

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Type of Benefit										
Age and service benefits:										
Retirees [a]	$99,219	$106,148	$114,244	$121,366	$130,019	$139,667	$150,335	$160,219	$170,031	$181,270
Beneficiaries [a]										
Lump-sum payments	$3,022	$3,095	$2,011	$2,483	$3,843	$4,858	$5,039	$3,532	$3,697	$3,154
In service death benefits: [b]	$1,489	$1,942	$1,421	$2,192	$1,587	$2,256	$2,329	$1,866	$1,705	$2,074
Disability benefits: [c]										
Total benefits	$103,730	$111,185	$117,676	$126,041	$135,449	$146,781	$157,703	$165,617	$175,433	$186,498
Type of Refund										
Death [b]										
Separation	$4,285	$4,858	$4,205	$3,801	$4,916	$4,738	$4,154	$4,052	$3,911	$4,045
Total refunds	$4,285	$4,858	$4,205	$3,801	$4,916	$4,738	$4,154	$4,052	$3,911	$4,045

Notes: Dollar amounts in thousands

[a] Segregation of age benefits for beneficiaries not currently available

[b] Segregation of death benefits between refunds and in service death benefits not currently available

[c] Segregation of disability benefits from age and service benefits not currently available

Includes benefit payments from 415 Restoration Plan

Excludes administrative expenses

SECTION E

STATEMENT OF ACTUARIAL METHODS AND ASSUMPTIONS

Statement of Actuarial Methods and Assumptions
(Effective as of December 31, 2017)

The most recent experience study was completed in conjunction with the December 31, 2015 actuarial valuation. Please see our Experience Study report dated May 2016 to see more detail of the rationale for the current assumptions. As authorized under Article 6243n of the Vernon's Civil Statutes of the State of Texas, actuarial assumptions and methods are set by the Board of Trustees, based upon recommendations made by the plan's actuary.

A. ACTUARIAL ASSUMPTIONS

1. Investment Return Rate (adopted effective December 31, 2015)

   7.50% per annum, compounded annually, composed of an assumed inflation rate of 2.75% and a real rate of return of 4.75%, net of investment expenses.

2. Mortality

   a. Nondisabled annuitants (adopted effective December 31, 2015)

      Healthy retirees and beneficiaries – The RP-2014 Combined Healthy Mortality Tables with Blue Collar Adjustments. Generational mortality improvements in accordance with Scale BB from the table's base year of 2014 (see Item 21 for further discussion of mortality improvement).

   b. Disabled annuitants (adopted effective December 31, 2015)

      Disabled annuitants – The RP-2014 Combined Healthy Mortality Tables with Blue Collar Adjustments, set forward three years. Generational mortality improvements in accordance with Scale BB from the table's base year of 2014; minimum 3% rate of mortality at all ages (see Item 21 for further discussion of mortality improvement).

   c. Active members (adopted effective December 31, 2015)

      Active employees – The RP-2014 Employee Mortality Tables with Blue Collar Adjustments. Generational mortality improvements in accordance with Scale BB from the table's base year of 2014 (see Item 21 for further discussion).

Statement of Actuarial Methods and Assumptions (Effective as of December 31, 2017) (Continued)

3. Retirement Rates: (adopted effective December 31, 2015)
   The following rates of retirement are assumed for members eligible for normal retirement.

Age	Rates of Retirement	
	Males	Females
44 & under	22.0%	25.0%
45	22.0%	23.0%
46	22.0%	23.0%
47	22.0%	23.0%
48	22.0%	23.0%
49	22.0%	23.0%
50	22.0%	26.0%
51	22.0%	26.0%
52	22.0%	26.0%
53	22.0%	26.0%
54	22.0%	26.0%
55	22.0%	26.0%
56	22.0%	26.0%
57	22.0%	26.0%
58	22.0%	26.0%
59	22.0%	26.0%
60	22.0%	21.0%
61	22.0%	21.0%
62	27.0%	24.0%
63	22.0%	21.0%
64	22.0%	21.0%
65	22.0%	24.0%
66	30.0%	24.0%
67	30.0%	24.0%
68	22.0%	21.0%
69	22.0%	21.0%
70	22.0%	20.0%
71	22.0%	20.0%
72	22.0%	20.0%
73	22.0%	20.0%
74 & older	100.0%	100.0%

Group B members are assumed to retire at twice the applicable rate upon the first year they attain eligibility for normal retirement. Early retirement rates (of 1% at age 55 increasing by 1% every two years to 5% at ages 63 and 64) apply for Group B members.

Statement of Actuarial Methods and Assumptions (Effective as of December 31, 2017) (Continued)

4. Rates of Decrement Due to Withdrawal (adopted effective December 31, 2015)

   Rates of withdrawal are comprised of a select period for the first 3 years of employment and ultimate rates based on years of service from retirement after the end of the select period. The following rates during the select period apply at all ages during the applicable year of employment:

Years of Employment	Males	Females
1	0.125	0.175
2	0.115	0.160
3	0.090	0.140

Statement of Actuarial Methods and Assumptions
(Effective as of December 31, 2017)
(Continued)

After the select period ends, rates of withdrawal are based on the number of years from retirement. The rates are shown below for males and females

Years from Eligibility for Unreduced Retirement	Rates of Withdrawal After Select Period	
	Males	Females
1	0.0090	0.0086
2	0.0122	0.0160
3	0.0146	0.0201
4	0.0166	0.0237
5	0.0182	0.0238
6	0.0198	0.0239
7	0.0212	0.0261
8	0.0225	0.0282
9	0.0237	0.0302
10	0.0248	0.0320
11	0.0323	0.0422
12	0.0348	0.0444
13	0.0399	0.0465
14	0.0401	0.0525
15	0.0430	0.0575
16	0.0430	0.0575
17	0.0430	0.0575
18	0.0430	0.0575
19	0.0430	0.0575
20	0.0430	0.0575
21	0.0450	0.0600
22	0.0450	0.0600
23	0.0450	0.0600
24	0.0450	0.0600
25	0.0450	0.0600
26	0.0470	0.0650
27	0.0470	0.0650
28	0.0470	0.0650
29	0.0470	0.0650
30	0.0470	0.0650
31+	0.0500	0.0700

Statement of Actuarial Methods and Assumptions
(Effective as of December 31, 2017)
(Continued)

5. Disability Rates* (adopted effective December 31, 2015)

Sample rates are shown below:

Age	Rates of Decrement Due to Disability Males and Females
20	0.000004
25	0.000025
30	0.000099
35	0.000259
40	0.000494
45	0.000804
50	0.001188
55	0.001647
60	0.002180

* Rates are for disability due to all causes, occupational disability rates are assumed to be 10% of all causes.

6. Rates of Salary Increase (adopted effective December 31, 2015)

Years of Service	Promotional Rate of Increase	Total Annual Rate of Increase Including 2.75% Inflation Component and 1.25% Productivity Component
1 – 7	2.25%	6.25%
8	2.00%	6.00%
9	1.50%	5.50%
10	1.25%	5.25%
11 - 15	1.00%	5.00%
16 - 19	0.75%	4.75%
20 or more	0.00%	4.00%

7. DROP Participation: (adopted effective December 31, 2015)

It was assumed that 20% of retiring active members with at least 20 years of service would elect a "Backward" DROP. It is assumed that all members who Back Drop will elect to DROP back to the date that would provide the greatest actuarial value to the member.

Statement of Actuarial Methods and Assumptions
(Effective as of December 31, 2017)
(Continued)

8. Married Percentage: (adopted effective December 31, 1997)

   100% of the active members are assumed to be married.

9. There will be no recoveries once disabled: (adopted effective December 31, 1997)

10. Spousal Age Difference: (adopted effective December 31, 2012)

    Males are assumed to be three years older than their spouses.

11. Normal Form of Payment: (adopted effective December 31, 1997)

    It is assumed that all retiring members will elect the Life only form of payment with a guaranteed return of accumulated employee contributions.

12. Crediting Rate on Employee Contributions: (adopted effective December 31, 2002)

    It is assumed that the interest credit rate on employee contributions will be 6.0%.

13. Individual salaries used to project benefits: (adopted effective December 31, 1997)

    Rates of pay as of the valuation date are reported for all employees.

14. Pay increase timing: (adopted effective December 31, 1997)

    Middle of calendar year.

15. Decrement timing: (adopted effective December 31, 1997)

    Decrements of all types are assumed to occur mid-year.

16. Eligibility testing: (adopted effective December 31, 2002)

    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.

Statement of Actuarial Methods and Assumptions
(Effective as of December 31, 2017)
(Continued)

17. Decrement relativity: (adopted effective December 31, 2002)

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

18. Incidence of Contributions: (adopted effective December 31, 2002)

    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.

19. Benefit Service: (adopted December 31, 1997)

    All members are assumed to accrue one year of eligibility service each year.

20. Mortality Improvement:

    The base mortality tables are anchored at the year 2014. To account for future mortality improvement, the base mortality rates shown in Item 2 are projected forward using scale BB for all future years.

21. Service Purchases (military, permissive, and sick leave conversion):

    No service purchases of any type are assumed. Any gains or losses due to these purchases are recognized in the valuation following the purchase.

22. Cost of Living Adjustments:

    No future cost of living adjustments are assumed.

ACTUARIAL VALUE OF ASSETS

The actuarial value of assets is equal to the market value of assets less a five-year phase in of the Excess (Shortfall) between expected investment return and actual income. The expected investment return each year is calculated based on the actuarial value of assets with the difference from actual income smoothed in over five years in 20% increments. If the current year's difference is opposite sign of the prior years' deferred Excesses/(Shortfalls), then the prior years' bases (starting with the oldest) are reduced dollar for dollar along with the current year's base. Any remaining bases are then recognized over five years (20% per year) from their initial creation.

Statement of Actuarial Methods and Assumptions
(Effective as of December 31, 2017)
(Continued)

If the resulting preliminary asset value is less than 80% or more than 120% of the market value of assets, then 1/3 of the amount outside of the 80%-120% corridor is recognized in the final actuarial value of assets.

B. ACTUARIAL FUNDING METHOD

The actuarial accrued liability is determined using the Entry Age Normal actuarial cost method. This method assigns the System's total actuarial present value of future benefits to various periods. The actuarial accrued liability is assigned to years prior to the valuation and the normal cost is assigned to the year following the valuation. The remaining costs are assigned to future years.

The normal cost is determined on an individual basis using the Individual Entry Age Normal Cost method. The actuarial accrued liability is the difference between the total present value of future benefits and the actuarial present value of future normal costs where future normal costs are based on the benefit provisions that are applicable to each individual member. The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of assets.

C. FUNDING PERIOD

The funding period is determined using an open group projection. In the open group projection, the demographic assumptions are applied to the current active employees and any employees that are assumed to leave employment are replaced one for one with a new employee. Over time this results in the change of the employee group from mostly Group A members to Group B members. The projection is built to assume no gains or losses on the actuarial accrued liability or the actuarial value of assets. The funding period is the length of time it takes in the open group projection for the actuarial value of assets to exceed the actuarial accrued liability.

In the projection, new members’ pay are assumed to increase at 4.00% year over year (i.e. a new employee in 2015 is assumed to be hired at a salary that is 4.00% greater than a new employee hired in 2014. The 4.00% growth rate is equal to our wage inflation assumption of 4.00% (ultimate salary increase assumption showing in Item A.6.)

D. CHANGES IN ASSUMPTIONS AND METHODS

No changes in the actuarial assumptions and methods since the prior valuation.

SECTION F

SUMMARY OF BENEFIT PROVISIONS

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017

A. EFFECTIVE DATE

January 1, 1941.

B. ELIGIBILITY AND PARTICIPATION

Any regular and permanent employee of the City of Austin, excluding all civil service commissioned police officers and firefighters, the Mayor and members of the City Council and all part-time employees who work less than 75 percent of a normal work week.

Members originally hired prior to January 1, 2012 are classified as Group A members and members hired on or after January 1, 2012 are classified as Group B members.

Unless noted otherwise, the provisions for Group A and Group B are the same.

C. MEMBERSHIP SERVICE

The period of time during which an eligible employee pays into and keeps on deposit the contribution prescribed to be paid by the employee into the System.

D. AVERAGE FINAL COMPENSATION

The average of the monthly compensation for the 36 calendar months of highest compensation during the last 120 months prior to termination. The monthly compensation used in the determination of benefits cannot exceed the compensation limits of Internal Revenue Code §401(a)(17) for the applicable period. The limit for 2011 is up to $20,416.67 for persons who first become members after 1995 (members hired prior to 1996 have no limit on their compensation).

E. CITY AND MEMBER CONTRIBUTION RATES

The City currently contributes a base rate of 8.00% of pay for each active member. Under the Amended Supplemental Funding Plan, the City is providing an additional contribution for each active member. Beginning October 1, 2012, this additional contribution became 10% of pay, for a total city contribution of 18%. Each active member contributes 8.00% of pay. These employee contributions are made under a pre-tax 401(h) pick-up arrangement.

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

F. RETIREMENT BENEFITS

1. Normal Retirement

a. Eligibility:

Group A – A participant may retire upon attaining age 62, or any age with 23 years of service, or attaining age 55 with 20 years of service.

Group B – A participant may retire upon attaining age 62 with 30 years of service, or at age 65 with 5 years of service.

b. Monthly Benefit:

Group A – 3.00% of average final compensation times years of service.

Group B – 2.50% of average final compensation times years of service.

c. Payment Form: Benefits are paid as a monthly life annuity to the participant, with a provision that should the participant die prior to receiving monthly payments whose sum is greater than or equal to the participant's accumulated employee contributions, then the participant's beneficiary shall receive a lump-sum equal to the excess of the participant's accumulated employee contributions with interest over the sum of the monthly payments received.

d. Optional Forms of Payment:

i) Joint and contingent annuity with either 100%, 66 2/3%, or 50% of the reduced retirement income payable for the life of the contingent annuitant upon the death of the retiring participant, with the provision that, should the contingent annuitant predecease the participant, the monthly annuity will revert to the amount that would have been payable under the normal form of payment,

ii) Joint and 66 2/3% last survivor provides a reduced retirement income payable as long as both the member and the joint annuitant are alive, and upon the death of either the member or the joint annuitant, the benefit reduces to 2/3 of such amount for the remainder of the life of the last survivor,

iii) Period certain and life annuity with 15 years of payments guaranteed, or

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

e. Deferred Retirement Option Program (DROP): A member may elect to retroactively participate in the System's DROP (i.e. a Backward DROP). The member would receive a lump-sum payment equal to 90% of the sum of the monthly annuities the participant would have received if the member had retired at the DROP entry date. No COLAs are included but changes in the benefit multiplier are reflected. The maximum period a member may retroactively elect under the DROP is 60 months.

2. Early Retirement:

a. Eligibility:

Group A – Currently there are no reduced retirement benefits under the plan.

Group B – A participant may retire with a reduced benefit upon attaining age 55 with 10 years of service.

b. Monthly Benefit:

Group A – Not applicable.

Group B – the same formula benefit as determined under normal retirement multiplied by an actuarial equivalent early retirement reduction factor.

G. DISABILITY RETIREMENT

1. Eligibility: If the employee is terminated by reason of a total and permanent disability which prevents the employee from engaging in any employment duties. If the employee has less than five years of service, the disability must be job related.

2. Monthly Benefit: Same as Normal Retirement benefit using pay and service at date of disability.

3. Form of Payment: The normal form of payment that is available to a member taking normal retirement and the optional forms of payments described in F.1.d.i) and F.1.d.ii) above.

Summary of Benefit Provisions
of the Retirement Plan as of December 31, 2017
(Continued)

H. VESTING OF BENEFITS

1. Vesting

An employee is vested according to the following schedule:

Years of Vesting Service	Vested Percentage
Less than 5	0%
5 or more	100%

Benefits Upon Vesting

A vested participant is entitled to the retirement benefit payable at normal retirement earned to the date of participant's termination multiplied by his/her vested percentage, or a refund of the employee's accumulated employee contributions with interest.

I. DEATH IN SERVICE

1. Eligibility: All active members.

2. Benefit: The amount of the benefit payable to the beneficiary is:

a. Employee eligible for retirement at date of death:

The surviving spouse if any may elect to receive an annuity equal to the monthly benefit as if the member had retired under any retirement option that would have been available to the member at the end of the month in which the member died. If there is no surviving spouse, then the beneficiary may elect to receive a 15 years certain and life annuity. The surviving spouse or beneficiary instead of electing the annuity may elect to receive a death benefit equal to twice the member's accumulated employee contributions with interest.

b. Employee not eligible for retirement at date of death:

A refund of the member’s accumulated deposits (with interest) plus a death benefit from COAERS equal to the member's accumulated deposits (with interest), but excluding any purchases for Non-contributory time, prior military service purchases, or Supplementary Service Credit.

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

J. RETIREE LUMP-SUM DEATH BENEFIT

Upon death of a retired member, a $10,000 lump-sum death benefit is payable. This benefit is also payable upon the death of an active member eligible for retirement whose surviving spouse or beneficiary elects to receive an annuity.

K. COST-OF-LIVING ADJUSTMENT (COLA)

On January 1 of each year the Board may approve a cost-of-living adjustment for those retirees who retired on or before December 31 of the previous year. The maximum adjustment which can be approved is 6%. The amount of the adjustment is set by the Board upon recommendation by the System's actuary that such an adjustment will not make the Fund financially unsound, and the adjustment is not inconsistent with the Code. The adjustment is prorated for any benefit which has been in effect for less than a year, with the proration being 1/12 for each monthly payment received during the prior year.

L. LUMP-SUM ADDITIONAL BENEFIT PAYMENT

Once each year the Board may approve a lump-sum additional benefit payment to be paid to those members and beneficiaries currently in payment status. The additional payment would be equal to a percentage of the member's monthly annuity with a maximum percentage of 100%.

M. LEGISLATED PLAN CHANGES ENACTED BY 1995 LEGISLATURE

1. 2.3% Multiplier

   The benefit multiplier was increased from 2.2% per year of service to 2.3% per year of service effective October 1995.

2. 2.3% Retiree Gross-up

   Effective October 1995, current retirees received an increase in their benefit amount to bring their retirement benefit amount up to what it would be currently if they had retired under the 2.3% multiplier.

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

3. <u>$10,000 Retiree Lump-Sum Death Benefit</u>

   The lump-sum death benefit payable upon the death of a retiree was increased from $2,000 to $10,000.

4. <u>Plan Participation Begins at Date of Hire</u>

   The six-month service requirement for participation was eliminated. Current active members were granted service for the period between their date of hire and their date of participation, up to six months.

N. <u>LEGISLATED PLAN CHANGES ENACTED BY 1997 LEGISLATURE</u>

1. <u>2.6% Multiplier</u>

   The benefit multiplier was increased from 2.3% per year of service to 2.6% per year of service effective October 1997.

2. <u>2.6% Retiree Gross-up</u>

   Effective October 1997, current retirees received an increase in their benefit amount to bring their retirement benefit amount up to what it would be currently if they had retired under the 2.6% multiplier.

3. <u>Military Service Purchase</u>

   Increased the number of months of military service that may be purchased from 24 to 48.

4. <u>Noncontributory Service Purchase</u>

   Allowed an employee to purchase noncontributory service for the following periods of time: (1) while employee was on workers' compensation leave, (2) while employee was on an authorized leave of absence, and (3) while employee performed service for the employer in a position for which the service was not otherwise creditable. The employee pays the full actuarial cost of the service purchase.

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

5. Employer Purchase of Creditable Service

   Allowed the employer to purchase the amount of service required to qualify an employee for an unreduced retirement benefit at age 55. To be eligible for the purchase, the employee must never have been a highly compensated employee within the meaning of IRC Section 414(q). The cost of the service purchase is the full actuarial cost of both the benefit and the retirement eligibility.

O. LEGISLATED PLAN CHANGES ENACTED BY 1999 LEGISLATURE

1. 2.7% Multiplier

   The benefit multiplier was increased from 2.6% per year of service to 2.7% per year of service effective October 1999.

2. 2.7% Retiree Gross-up

   Effective October 1999, current retirees received an increase in their benefit amount to bring their retirement benefit amount up to what it would be currently if they had retired under the 2.7% multiplier.

3. 23 & Out Provision

   The service requirement at which a participant may retire with an unreduced retirement benefit was decreased from 25 years of Creditable Service to 23 years of Creditable Service.

4. Pop-Up Provisions for Certain Joint and Survivor Payment Options

   Certain optional forms of payment which extend coverage to a joint annuitant (Options I, II, and III) were amended so that, should the contingent annuitant predecease the participant, the monthly annuity will revert to the amount that would have been payable under the normal form of payment.

5. LUMP-SUM ADDITIONAL BENEFIT PAYMENT

   The Board was given the ability to make an additional payment to members and beneficiaries in payment status in the form of a lump-sum additional benefit payment. The additional payment would be a percentage of the current monthly payment with a maximum percentage of 100%.

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

6. EMPLOYER PURCHASE OF CREDITABLE SERVICE

   Limitations on employer purchases of Creditable Service for a Member before actual retirement were removed.

P. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2000

1. "415 Restoration of Retirement Income Plan"

   Certain highly compensated members may have their retirement annuity limited because of Section 415(b)(1) of the Internal Revenue Code. A plan amendment effective January 1, 2000, provides for COAERS to pay a benefit payment that exceeds the maximum benefit limitation imposed by the Internal Revenue Code from a separate, non-qualified, pay-as-you-go "Restoration of Retirement Income Plan."

2. 2.98% Multiplier

   The benefit multiplier was increased from 2.7% per year of service to 2.98% per year of service effective April 2000.

3. 2.98% Retiree Gross-up

   Effective April 2000, current retirees received an increase in their benefit amount to bring their retirement benefit amount up to what it would be currently if they had retired under the 2.98% multiplier.

4. "Pop-up" Benefit Amendment

   The "pop-up" benefit is extended to retirees who selected the actuarial equivalent of Life Annuity option with underlying options of I, II, or III.

Q. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2001

None

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

R. <u>BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2002</u>

1. <u>3.00% Multiplier</u>

   Benefit multiplier was increased from 2.98% per year of service to 3.00% per year of service effective January 2002.

2. <u>3.00% Retiree Gross-up</u>

   Effective January 2002, current retirees received an increase in their benefit amount to bring their retirement benefit amount up to what it would be currently if they had retired under the 3.00% multiplier.

3. <u>Deferred Retirement Option Program</u>

   A "Backward" DROP was added as an optional benefit effective in 2002. The retiring member may elect to retroactively participate in a DROP. The member would receive a lump-sum payment equal to 90% of the sum of the monthly annuities the participant would have received if the member had retired at the DROP entry date. No COLAs are included but changes in the benefit multiplier are reflected.

4. <u>Purchase of Permissive Time</u>

   A member may purchase up to five years of Permissive Time. The purchase price charged to the member is the anticipated actuarial cost to the System for the additional service. Minimum purchase is one month with a maximum of 60 months (5 years) or the number of months needed to reach first eligibility for retirement whichever is less.

5. <u>Conversion of Unused Sick Leave</u>

   At retirement an employee may elect to purchase Creditable Service for unused sick leave. The Board requires payment by the Member, and then by the City of the equivalent amount of retirement contributions that would have been made had the sick hours been exercised as sick hours. An employee must already be eligible for retirement to purchase the service.

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

S. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2003

1. "Pop-up" Benefit Amendment

   "Pop-up" benefit was extended to any Joint and Survivor option (including level income options), other than Joint and Last Survivor.

2. Permissive Time Amendment

   Permissive Time resolution was amended removing the provision that restricts members from purchasing Permissive Time in excess of the amount needed to reach first retirement eligibility.

T. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2004

None

U. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2005

None

V. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2006

None

W. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2007

None

X. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2008

None

Y. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2009

None

Z. BENEFIT ENHANCEMENTS ENACTED BY THE BOARD OF TRUSTEES IN 2010

None

Summary of Benefit Provisions of the Retirement Plan as of December 31, 2017 (Continued)

AA. LEGISLATED PLAN CHANGES ENACTED BY THE 2011 LEGISLATURE

1. Retirement Provisions

   For members hired on after January 1, 2012 (Group B members), changed the eligibility for normal retirement to age 65 with 5 years of service, or age 62 with 30 years of service. Also for members hired on or after January 1, 2012, added an eligibility for early retirement upon age 55 with 10 years of service.

2. Benefit Multiplier

   For members hired on after January 1, 2012, the benefit multiplier was changed to 2.5% per year of service. Early retirement benefits would be reduced on an actuarially equivalent basis.

BB. BENEFIT ENHANCEMENTS ENACTED IN 2012-2017

There have been no changes to the benefit provisions of the Plan since January 1, 2012.

SECTION G

DEFINITION OF TERMS

Definition of Terms

1. ***Actuarial Cost Method***

   A method for determining the actuarial present value of future benefits and allocating such value to time periods in the form of a normal cost and an actuarial accrued liability.

2. ***Present Value of Future Benefits***

   This is computed by projecting the total future benefit cash flow from the System, using actuarial assumptions, and then discounting the cash flow to the valuation date.

3. ***Normal Cost***

   Computed differently under different actuarial cost methods, the normal cost generally represents the value of the portion of the participant's anticipated retirement, termination, and/or death and disability benefits accrued during a year.

4. ***Actuarial Accrued Liability***

   Computed differently under different actuarial cost methods. Generally actuarial accrued liability represents the value of the portion of the participant's anticipated retirement, termination, and/or death and disability benefits accrued as of the valuation date.

5. ***Entry Age Actuarial Cost Method***

   A method under which a participant's actuarial present value of future benefits is allocated on a level basis over the earnings of the participant between his/her entry into the System and his/her assumed exit.

6. ***Unfunded Actuarial Accrued Liability***

   The difference between total actuarial present value of future benefits over the sum of the tangible assets of the System and the actuarial present value of the members' future normal costs. The System is underfunded if the difference is positive and overfunded if the difference is negative.

7. ***Actuarial Value of Assets***

   The value of cash, investments, and other property belonging to the System, as valued by the actuary for purposes of the actuarial valuation.

Definition of Terms
(Continued)

8. ***Actuarial Gain or Loss***

   From one valuation to the next, if the experience of the plan differs from that anticipated by the actuarial assumptions, an actuarial gain or loss occurs. For example, an actuarial gain would occur if the assets in the trust had a yield of 12% based on actuarial value, while the assumed yield on the actuarial value of assets was 7.50%.