

AUSTIN FIREFIGHTERS'  
RELIEF AND RETIREMENT FUND

ACTUARIAL VALUATION  
AS OF DECEMBER 31, 2017



August 10, 2018

Mr. William E. Stefka  
Austin Firefighters'  
Relief and Retirement Fund  
4101 Parkstone Heights Drive, Suite 270  
Austin, TX 78746

Re: Austin Firefighters' Relief and Retirement Fund

Dear Mr. Stefka:

We are pleased to present to the Board this report of the annual actuarial valuation of the Austin Firefighters' Relief and Retirement Fund (AFRRF). Included are the related results for GASB Statements No. 67 and No. 68. The funding valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and to develop the funding period required to amortize any existing Unfunded Actuarial Accrued Liability. The calculation of the liability for GASB results was performed for the purpose of satisfying the requirements of GASB Statements No. 67 and No. 68. Please note that this valuation may not be applicable for any other purposes.

The valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board, and reflects laws and regulations issued to date pursuant to the provisions of the Texas Local Fire Fighters' Retirement Act (TLFFRA) and Vernon's Texas Civil Statutes, as well as applicable federal laws and regulations. In our opinion, the assumptions used in this valuation, as adopted by the Board of Trustees, represent reasonable expectations of anticipated plan experience. Future actuarial measurements may differ significantly from the current measurements presented in this report for a variety of reasons including: changes in applicable laws, changes in plan provisions, changes in assumptions, or plan experience differing from expectations.

In conducting the valuation, we have relied on personnel, plan design, financial reports, and asset information supplied by the AFRRF staff, and the actuarial assumptions and methods described in the Actuarial Assumptions section of this report. While we cannot verify the accuracy of all this information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy of the information and believe that it has produced appropriate results. This information, along with any adjustments or modifications, is summarized in various sections of this report.

The total pension liability, net pension liability, and certain sensitivity information shown in this report are based on an actuarial valuation performed as of January 1, 2017. It is our opinion that the assumptions used for this purpose are internally consistent, reasonable, and comply with the requirements under GASB No. 67 and No. 68.

The undersigned is familiar with the immediate and long-term aspects of pension valuations, and meets the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. All of the sections of this report are considered an integral part of the actuarial opinions.

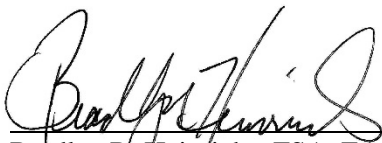
To our knowledge, no associate of Foster & Foster Inc. working on valuations of the program has any direct financial interest or indirect material interest in the city of Austin, nor does anyone at Foster & Foster Inc. act as a member of the Board of Trustees of the AFRRF. Thus, there is no relationship existing that might affect our capacity to prepare and certify this actuarial report.

If there are any questions, concerns, or comments about any of the items contained in this report, please contact me at 239-433-5500.

Respectfully submitted,

Foster & Foster Inc.

By:



Bradley R. Heinrichs, FSA, EA, MAAA  
Enrolled Actuary #17-6901

BRH/lke

Enclosures

## TABLE OF CONTENTS

### **Introduction**

Summary of Report.....	5
Changes since Prior Valuation.....	7
Comparative Summary of Principal Valuation Results.....	8
Gain/Loss Analysis.....	10

### **Report Information**

Actuarial Assumptions and Methods.....	11
Valuation Notes.....	14
Statement by Enrolled Actuary.....	15

### **Trust Fund**

Statement of Fiduciary Net Position.....	16
Statement of Changes in Fiduciary Net Position.....	17
Actuarial Asset Valuation.....	18
Changes in Net Assets Available for Benefits.....	19

### **Member Statistics**

Statistical Data.....	20
Age and Service Distribution.....	21

### **Summary of Benefit Provisions**

Summary.....	22
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### **Governmental Accounting Standards Board Disclosure Statements**

GASB 67.....	25
GASB 68.....	37

## SUMMARY OF REPORT

The regular annual actuarial valuation of the Austin Firefighters' Relief and Retirement Fund, performed as of December 31, 2017, has been completed and the results are presented in this Report. The pension costs, compared with those developed in the December 31, 2016 actuarial valuation, are as follows:

<u>Valuation Date</u>	<u>12/31/2017</u>	<u>12/31/2016</u>
Current Normal Cost Rate		
% of Covered Payroll	29.46%	29.16%
<hr/>		
Actuarial Accrued Liability (AAL)	\$1,038,118,085	\$981,771,267
Actuarial Value of Assets (AVA)	\$916,931,534	\$866,512,111
Unfunded Actuarial Accrued Liability (UAAL = AAL - AVA)	\$121,186,551	\$115,259,156
Funded Ratio (AVA / AAL)	88.3%	88.3%
Amortization Period <sup>2</sup>	16.95 years	16.17 years
<hr/>		
Expected City Contribution Rate	22.05%	22.05%
Expected Member Contribution Rate	18.70%	18.70%
Total Expected Contribution Rate	40.75%	40.75%
<hr/>		
City 20-Year Funding Cost	20.85%	20.48%
City 30-Year Funding Cost <sup>1</sup>	18.71%	18.35%
City 40-Year Funding Cost	17.71%	17.37%

<sup>1</sup> Per Section 802.101(a) of the Texas Government Code, the actuarial valuation must include a recommended contribution rate needed for the system to achieve and maintain an amortization period that does not exceed 30 years.

<sup>2</sup> If the actuarial smoothing technique was removed and the market value of assets was utilized to determine the amortization period, the result would be 10.50 years as of December 31, 2017.

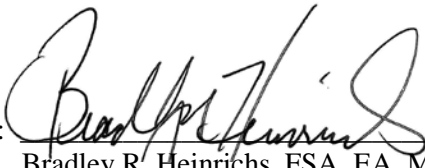
During the past year, the plan has realized favorable actuarial experience. The primary component of actuarial gain was attributable to average increases in pensionable earnings that were below the assumed rate.

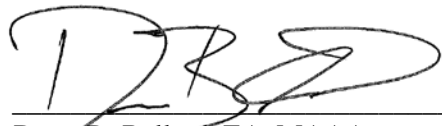
Despite these net actuarial gains, the plan realized an increase in liabilities as a result of granting a 2.20% cost-of-living adjustment to eligible retirees, effective January 1, 2018.

The balance of this Report presents additional details of the actuarial valuation and the general operation of the Fund. The undersigned would be pleased to meet with the Board of Trustees in order to discuss the Report and answer any pending questions concerning its contents.

Respectfully submitted,

FOSTER & FOSTER INC.

By:   
Bradley R. Heinrichs, FSA, EA, MAAA

By:   
Drew D. Ballard, EA, MAAA

## CHANGES SINCE PRIOR VALUATION

### Fund Changes

There have been no changes in benefit provisions since the prior valuation.

### Actuarial Assumption/Method Changes

There have been no changes to the assumptions or methods since the prior valuation.

## COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	<u>12/31/2017</u>	<u>12/31/2016</u>
<b>A. Participant Data</b>		
Actives	1,045	990
Service Retirees + DROP	650	618
Beneficiaries	74	71
QDRO	44	44
Disability Retirees	18	17
Terminated Vested	9	7
 Total	 <u>1,840</u>	 <u>1,747</u>
 Covered Payroll	 88,578,067	 84,864,171
Payroll Under Assumed Ret. Age	88,209,122	84,500,978
 Annual Rate of Payments to:		
Service Retirees	39,941,555	36,626,360
Beneficiaries	2,881,465	2,637,771
QDRO	863,300	830,901
Disability Retirees	744,706	694,439
Terminated Vested	317,466	256,595
 <b>B. Assets</b>		
Actuarial Value	916,931,534	866,512,111
Market Value	953,798,227	829,610,196
 <b>C. Liabilities *</b>		
Present Value of Benefits		
Active Members		
Retirement + Vested Benefits	692,205,014	670,666,482
Death Benefits	8,369,038	8,056,817
Disability Benefits	23,971,186	22,777,807
Service Retirees + DROP	532,178,906	479,203,306
Beneficiaries	23,055,003	21,063,811
QDRO	9,422,560	9,194,296
Disability Retirees	6,568,655	6,158,042
Terminated Vested	2,783,086	2,276,246
 Total	 <u>1,298,553,448</u>	 <u>1,219,396,807</u>

\* Liabilities shown represent present value of future payments.

	<u>12/31/2017</u>	<u>12/31/2016</u>
C. Liabilities - (Continued)		
Present Value of Future Salaries	918,035,842	846,052,806
Normal Cost (Entry Age Normal)		
Retirement + Vested Benefits	23,316,755	22,107,403
Death Benefits	563,692	542,455
Disability Benefits	1,250,055	1,180,638
Total Normal Cost	<u>25,130,502</u>	<u>23,830,496</u>
Present Value of Future Normal Costs	260,435,363	237,625,540
Actuarial Accrued Liability		
Retirement + Vested Benefits	450,208,818	449,883,922
Death Benefits	2,865,171	2,945,121
Disability Benefits	11,035,886	11,046,523
Inactives	574,008,210	517,895,701
Total Actuarial Accrued Liability	<u>1,038,118,085</u>	<u>981,771,267</u>
Unfunded Actuarial Accrued Liability (UAAL)	121,186,551	115,259,156
Funded Ratio (AVA/AL)	88.3%	88.3%
D. Actuarial Present Value of Accrued Benefits		
Inactives	574,008,210	517,895,701
Actives	345,230,441	328,470,323
Total Present Value Accrued Benefits	<u>919,238,651</u>	<u>846,366,024</u>
Funded Ratio (MVA/PVAB)	103.8%	98.0%

## GAIN/LOSS ANALYSIS

### a. Total Gain/(Loss)

1. Unfunded Actuarial Accrued Liability as of December 31, 2016	115,259,156
2. Normal Cost applicable for 2017	23,830,496
3. Interest on (1) and (2)	10,709,903
4. Contributions made during 2017	35,560,974
5. Interest on (4)	1,343,711
6. Expected UAAL as of December 31, 2017: (1)+(2)+(3)-(4)-(5)	112,894,870
7. Actual UAAL as of December 31, 2017	121,186,551
 Total Actuarial Gain/(Loss) <sup>1</sup>	 (8,291,681)

### b. Gain/(Loss) on Assets

1. Actuarial Value of Assets as of December 31, 2016	866,512,111
2. Contributions Less Benefit Payments	(16,327,481)
3. Expected Investment Earnings	66,092,825
4. Expected AVA as of December 31, 2017: (1)+(2)+(3)	916,277,455
5. Actual Actuarial Value of Assets as of December 31, 2017	916,931,534
 Gain/(Loss) on Assets	 654,079

### c. Gain/(Loss) on Liabilities

1. Expected Actuarial Accrued Liability: a(6)+b(4)	1,029,172,325
2. Actual Actuarial Accrued Liability	1,038,118,085
 Gain/(Loss) on Liabilities <sup>1</sup>	 (8,945,760)

<sup>1</sup> Includes increase in liabilities associated with the 2.2% cost-of-living adjustment that was granted to eligible retirees, effective January 1, 2018.

ACTUARIAL ASSUMPTIONS AND METHODS  
(Effective December 31, 2017)

Mortality Rates – Healthy Lives

RP2000 (Fully Generational using Scale AA) set back two years for males and females -- Sex Distinct.

The assumed rates of mortality sufficiently accommodates expected mortality improvements.

Mortality Rates – Disabled Lives

RP2000 Disability Mortality Table

Retirement Elections

See tables below. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.

Termination Rates

See tables below. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.

Disability Rates

See tables below. These assumptions were reviewed in conjunction with an actuarial experience study dated June 15, 2015.

Interest Rate

7.70% per year, compounded annually, net of all expenses. This is supported by the target asset allocation of the trust and the expected long-term return by asset class.

Salary Increases

See tables below. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.

General Wage Inflation

3.00% per year. This assumption was approved in conjunction with an actuarial experience study dated June 15, 2015.

Inflation

3.50% per year. This is reasonable based upon long-term historical experience.

Payroll Growth

3.50% per year for amortization of the Unfunded Actuarial Accrued Liability. This is reasonable based upon long-term historical experience.

Asset Valuation Method

All assets are valued at market value with an adjustment to uniformly spread investment gains and losses (as measured by actual market value investment return against expected market value investment return) over a five-year period.

Marital Status

100% of actives are assumed to be married at time of benefit commencement. Females are assumed to be 4 years younger than Males. Additionally, 50% are assumed to have dependent children. The age of the youngest child is assumed to be one year.

These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.

Funding Method

Entry Age Normal Actuarial Cost Method.

Termination Rates

<u>Years of Service</u>	<u>Termination Probability</u>
0-4	1.0%
5-13	0.5
14+	0

Retirement Rates

<u>Number of Years After First Eligibility for Early Retirement</u>	<u>Probability of Retirement</u>
0	2.0%
1	2.0
2	2.0
3	2.0
4	2.0
5	5.0
6	7.5
7	7.5
8	10.0
9	16.7
10	16.7
11	16.7
12	20.0
13	20.0
14	30.0
15	40.0
16	50.0
17	75.0
18	100.0

### Retro-DROP Elections

Number of Years After First Eligibility for <u>Early Retirement</u>	<u>No-DROP Elected</u>	<u>Duration 1 Election</u>	<u>Duration 2 Election</u>
0	90%	0.5 years (10%)	n/a
1	50%	1 year (50%)	n/a
2	50%	1 year (25%)	2 years (25%)
3	50%	1 year (25%)	2 years (25%)
4	20%	1 year (60%)	3 years (20%)
5	20%	2 years (40%)	4 years (40%)
6	20%	2 years (60%)	5 years (20%)
7	20%	2 years (50%)	5 years (30%)
8	20%	3 years (60%)	6 years (20%)
9	10%	3 years (50%)	6 years (40%)
10	10%	3 years (50%)	6 years (40%)
11	10%	3 years (60%)	6 years (30%)
12	10%	3 years (75%)	6 years (15%)
13	10%	3 years (40%)	6 years (50%)
14	10%	3 years (40%)	6 years (50%)
15	10%	3 years (20%)	6 years (70%)
16	10%	3 years (20%)	6 years (70%)
17	10%	3 years (20%)	6 years (70%)
18	10%	3 years (20%)	6 years (70%)

### Disability Rates

<u>Age</u>	<u>Probability of Disablement</u>
20	0.014%
25	0.019
30	0.031
35	0.052
40	0.092
45	0.209
50	0.379
55	0.490
60	0.911

### % Increase in Salary\*

<u>Years of Service</u>	<u>Increase</u>
0	6.00%
1	8.50
2	7.50
3	4.00
4	1.00
5	5.00
10	1.50
15	1.50
20	5.50
21+	1.00

\* Expected increase in salary in addition to general wage inflation assumption.

## VALUATION NOTES

Payroll under Assumed Retirement Age is the projected rate of pay as of the valuation date of all active participants who are not subject to a 100% probability of retirement in the first year following the valuation date, discounted to take into account the probability of remaining an active participant.

Covered Payroll is equal to the Payroll under Assumed Retirement Age, with an addition for the projected rate of pay for the active participants who are subject to a 100% probability of retirement in the first year following the valuation date, discounted to take into account interest for middle of year timing.

Present Value of Benefits is the single sum value on the valuation date of all future benefits to be paid to current Members, Retirees, Beneficiaries, Disability Retirees and Vested Terminations.

Normal (Current Year's) Cost is determined for each participant as the present value of future benefits, determined as of the Member's entry age, amortized as a level percentage of compensation over the anticipated number of years of participation, determined as of the entry age.

Individual Entry Age Normal Actuarial Cost Method (Level Percent of Compensation) is the method used to determine required contributions under the Fund. The use of this method involves the systematic funding of the Normal Cost (described above) and the Unfunded Accrued (Past Service) Liability. The actuarial accrued liability for active participants is the difference between the present value of future benefits and the present value of future Normal Costs. The actuarial accrued liability for inactive participants is the present value of future benefits.

Unfunded Actuarial Accrued Liability (UAAL) is the difference between the actuarial accrued liability (described above) and the actuarial value of assets.

## STATEMENT BY ENROLLED ACTUARY

This actuarial valuation was prepared and completed by me or under my direct supervision, and I acknowledge responsibility for the results. To the best of my knowledge, the results are complete and accurate, and in my opinion, the techniques and assumptions used are reasonable and meet the requirements and intent of the Texas Local Fire Fighters' Retirement Act (TLFFRA), Vernon's Texas Civil Statutes, and adhere to the Actuarial Standards of Practice. There is no benefit or expense to be provided by the plan and/or paid from the plan's assets for which liabilities or current costs have not been established or otherwise taken into account in the valuation. All known events or trends which may require a material increase in plan costs or required contribution rates have been taken into account in the valuation.



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Bradley R. Heinrichs, FSA, EA, MAAA  
Enrolled Actuary #17-6901

STATEMENT OF FIDUCIARY NET POSITION  
DECEMBER 31, 2017

<u>ASSETS</u>	COST VALUE	MARKET VALUE
Cash and Cash Equivalents:		
Property, Furniture & Equipment	235,821.00	235,821.00
Money Market	8,756,546.00	8,756,546.00
Total Cash and Equivalents	8,992,367.00	8,992,367.00
Receivables:		
From Broker for Investments Sold	2,371,068.00	2,371,068.00
Investment Income	131,974.00	131,974.00
Total Receivable	2,503,042.00	2,503,042.00
Investments:		
State Street Securities	815,692,943.00	942,833,000.00
Total Investments	815,692,943.00	942,833,000.00
Total Assets	827,188,352.00	954,328,409.00
<u>LIABILITIES</u>		
Payables:		
To Broker for Investments Purchased	530,182.00	530,182.00
Total Liabilities	530,182.00	530,182.00
NET POSITION RESTRICTED FOR PENSIONS	826,658,170.00	953,798,227.00

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION  
FOR THE YEAR ENDED DECEMBER 31, 2017  
Market Value Basis

ADDITIONS

Contributions:

Member	16,318,769.00
City	19,242,205.00

Total Contributions		35,560,974.00
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Investment Income:

Miscellaneous Income	30,917.00	
Net Realized Gain (Loss)	37,598,507.00	
Unrealized Gain (Loss)	101,367,119.02	
Net Increase in Fair Value of Investments		138,996,543.02
Interest & Dividends		4,500,138.00
Less Investment Expense <sup>1</sup>		(1,581,681.00)

Net Investment Income		141,915,000.02
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Total Additions		177,475,974.02
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DEDUCTIONS

Distributions to Members:

Benefit Payments	42,628,844.90
Lump Sum DROP Distributions	8,887,284.10
Refunds of Member Contributions	372,326.00

Total Distributions		51,888,455.00
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Administrative Expense		1,399,488.00
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Total Deductions		53,287,943.00
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Net Increase in Net Position		124,188,031.02
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NET POSITION RESTRICTED FOR PENSIONS

Beginning of the Year		829,610,195.98
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End of the Year		953,798,227.00
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<sup>1</sup>Investment related expenses include investment advisory, custodial and performance monitoring fees

ACTUARIAL ASSET VALUATION  
December 31, 2017

Actuarial Assets for funding purposes are developed by recognizing the total actuarial investment gain or loss for each Plan Year over a five year period. In the first year, 20% of the gain or loss is recognized. In the second year 40%, in the third year 60%, in the fourth year 80%, and in the fifth year 100% of the gain or loss is recognized. The actuarial investment gain or loss is defined as the actual return on investments minus the actuarial assumed investment return. Actuarial Assets shall not be less than 80% nor greater than 120% of Market Value of Assets.

Plan Year Ending	Gain/(Loss)	<u>Gains/(Losses) Not Yet Recognized</u>				
		Amounts Not Yet Recognized by Valuation Year				
		2018	2019	2020	2021	2022
12/31/2013	N/A	0	0	0	0	0
12/31/2014	N/A	0	0	0	0	0
12/31/2015	(54,636,462)	(21,854,586)	(10,927,294)	0	0	0
12/31/2016	(5,150,047)	(3,090,029)	(2,060,020)	(1,030,011)	0	0
12/31/2017	77,264,135	61,811,308	46,358,481	30,905,654	15,452,827	0
Total		36,866,693	33,371,167	29,875,643	15,452,827	0

	<u>Development of Investment Gain/(Loss)</u>
Market Value of Assets, 12/31/2016	829,610,196
Contributions Less Benefit Payments	(16,327,481)
Expected Investment Earnings*	63,251,377
Actual Net Investment Earnings	140,515,512
Actuarial Investment Gain/(Loss)	<u>77,264,135</u>

\*Expected Investment Earnings =  $0.077 * [829,610,196 + 0.5 * (16,327,481)]$

	<u>Development of Actuarial Value of Assets</u>
(1) Market Value of Assets, 12/31/2017	953,798,227
(2) Gains/(Losses) Not Yet Recognized	36,866,693
(3) Actuarial Value of Assets, 12/31/2017, (1) - (2)	<u>916,931,534</u>
(A) 12/31/2016 Actuarial Assets:	866,512,111
(I) Net Investment Income:	
1. Interest and Dividends	4,531,055
2. Realized Gains (Losses)	37,598,507
3. Change in Actuarial Value	27,598,511
4. Investment & Administrative Expenses	(2,981,169)
Total	<u>66,746,904</u>
(B) 12/31/2017 Actuarial Assets:	916,931,534
Actuarial Assets Rate of Return = $2I/(A+B-I)$ :	7.78%
Market Value of Assets Rate of Return:	17.11%
Actuarial Gain/(Loss) due to Investment Return (Actuarial Asset Basis)	654,079
12/31/2017 Limited Actuarial Assets:	916,931,534

CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS  
DECEMBER 31, 2017  
Actuarial Asset Basis

REVENUES

Contributions:		
Member	16,318,769.00	
City	19,242,205.00	
Total Contributions		35,560,974.00
Earnings from Investments:		
Interest & Dividends	4,500,138.00	
Miscellaneous Income	30,917.00	
Net Realized Gain (Loss)	37,598,507.00	
Change in Actuarial Value	27,598,511.02	
Total Earnings and Investment Gains		69,728,073.02

EXPENDITURES

Distributions to Members:		
Benefit Payments	42,628,844.90	
Lump Sum DROP Distributions	8,887,284.10	
Refunds of Member Contributions	372,326.00	
Total Distributions		51,888,455.00
Expenses:		
Investment related <sup>1</sup>	1,581,681.00	
Administrative	1,399,488.00	
Total Expenses		2,981,169.00
Change in Net Assets for the Year		50,419,423.02
Net Assets Beginning of the Year		866,512,110.98
Net Assets End of the Year <sup>2</sup>		916,931,534.00

<sup>1</sup>Investment related expenses include investment advisory, custodial and performance monitoring fees.

<sup>2</sup>Net Assets may be limited for actuarial consideration.

## STATISTICAL DATA

	<u>12/31/2015</u>	<u>12/31/2016</u>	<u>12/31/2017</u>
Actives	1,050	990	1,045
Average Current Age	42.6	43.1	42.5
Average Age at Employment	28.4	28.6	28.9
Average Past Service	14.2	14.5	13.6
Average Annual Salary	\$86,181	\$90,088	\$89,026

## AGE AND SERVICE DISTRIBUTION

### PAST SERVICE

AGE	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	30+	Total
15 - 19	0	0	0	0	0	0	0	0	0	0	0	0
20 - 24	4	1	0	0	0	0	0	0	0	0	0	5
25 - 29	38	17	0	17	1	1	0	0	0	0	0	74
30 - 34	38	28	0	49	19	25	4	0	0	0	0	163
35 - 39	23	15	0	21	41	64	35	14	0	0	0	213
40 - 44	0	0	0	5	17	36	66	58	12	0	0	194
45 - 49	0	0	0	0	3	12	47	63	75	5	0	205
50 - 54	0	0	0	0	0	0	3	22	59	49	7	140
55 - 59	0	0	0	0	0	0	0	0	4	25	18	47
60 - 64	0	0	0	0	0	0	0	0	0	0	4	4
65+	0	0	0	0	0	0	0	0	0	0	0	0
Total	103	61	0	92	81	138	155	157	150	79	29	1,045

AUSTIN FIREFIGHTERS'  
RELIEF AND RETIREMENT FUND  
SUMMARY OF BENEFIT PROVISIONS

<u>Service</u>	Total years and completed months during which a Member makes contributions to the Fund.
<u>Average Monthly Compensation</u>	Average Salary for the highest 36 months of service.
<u>Member Contributions</u>	18.70% of Salary.
<u>City Contributions</u>	22.05% or payroll.
<u>Normal Retirement</u>	
Date	Earlier of age 50 and 10 years of Service, or 25 years of Service, regardless of age.
Benefit	3.30% of Average Monthly Compensation <u>times</u> Service (\$1,200 minimum). Effective July 1, 2012, the minimum benefit was increased to \$2,000 per month for all retirees and surviving spouses currently receiving normal or disability retirement benefits which commenced prior to January 1, 1994.
Form of Benefit	<u>Married</u> : Life Annuity with 75% continued to Surviving Spouse  <u>Single</u> : Life Annuity (options available)
<u>Early Retirement</u>	
Date	Earlier of age 45 and 10 years of Service, or 20 years of Service, regardless of age.
Benefit	Same for Normal Retirement as shown above. Members who retire under Early Retirement are not eligible to receive any COLA adjustments until the date they would have met Normal Retirement eligibility requirements.

## Vesting

Schedule	100% after 10 years of Service.
Benefit Amount	Member will receive his (her) accrued benefit payable at age 50 or the date they would have completed 25 years of Service had they remained employed.  Non-vested members receive a refund of member contributions accumulated with 5.0% interest.

## Disability

Eligibility	Disability preventing the Member from performing the duties of a firefighter during the two and one-half years after becoming disabled or any employment after the two and one-half years after becoming disabled.
Benefit	Accrued benefit at date of disability, but not less than 66% of Average Monthly Compensation.
Form of Benefit	<u>Married</u> : Life Annuity with 75% continued to Surviving Spouse  <u>Single</u> : Life Annuity (options available).

## Death Benefits

Surviving Spouse of Member:	75% of Member's accrued benefit at date of death, but not less than 49.5% of Average Monthly Compensation.
Dependent Children of Member: (with Surviving Spouse)	Each child is entitled to 15% of Member's accrued benefit at date of death, but not less than 9.9% of Average Monthly Compensation.
Dependent Children of Member: (with no Surviving Spouse)	75% of Member's accrued benefit at date of death, but not less than 49.5% of Average Monthly Compensation, split equally among each dependent child.

## Cost of Living Adjustment

Eligibility	Normal Retirement.
Amount	Determined by the actuary if providing a COLA will not impair financial stability of the Fund.

## Retroactive DROP

Eligibility

Satisfaction of Early or Normal Retirement Eligibility.

Participation Period

Upon election to retroactively enter DROP, the Retro DROP period will not exceed 84 months.

Rate of Return

5.0%, compounded annually, on monthly benefits that would have been deposited into a DROP account and Member contributions deposited into the fund between the effective DROP entry date and the actual date of termination.

STATEMENT OF FIDUCIARY NET POSITION  
DECEMBER 31, 2017

<u>ASSETS</u>	MARKET VALUE
Cash and Cash Equivalents:	
Property, Furniture & Equipment	235,821
Money Market	8,756,546
Total Cash and Equivalents	8,992,367
Receivables:	
From Broker for Investments Sold	2,371,068
Investment Income	131,974
Total Receivable	2,503,042
Investments:	
State Street Securities	942,833,000
Total Investments	942,833,000
Total Assets	954,328,409
<u>LIABILITIES</u>	
Payables:	
To Broker for Investments Purchased	530,182
Total Liabilities	530,182
NET POSITION RESTRICTED FOR PENSIONS	953,798,227

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION  
FOR THE YEAR ENDED DECEMBER 31, 2017  
Market Value Basis

ADDITIONS

## Contributions:

Member	16,318,769	
City	19,242,205	
Total Contributions		35,560,974
Investment Income:		
Miscellaneous Income	30,917	
Net Realized Gain (Loss)	37,598,507	
Unrealized Gain (Loss)	101,367,119	
Net Increase in Fair Value of Investments	138,996,543	
Interest & Dividends	4,500,138	
Less Investment Expense <sup>1</sup>	(1,581,681)	
Net Investment Income		141,915,000
Total Additions		177,475,974

DEDUCTIONS

## Distributions to Members:

Benefit Payments	42,628,845	
Lump Sum DROP Distributions	8,887,284	
Refunds of Member Contributions	372,326	
Total Distributions		51,888,455
Administrative Expense		1,399,488
Total Deductions		53,287,943
Net Increase in Net Position		124,188,031
NET POSITION RESTRICTED FOR PENSIONS		
Beginning of the Year		829,610,196
End of the Year		953,798,227

<sup>1</sup>Investment related expenses include investment advisory, custodial and performance monitoring fees.

## NOTES TO THE FINANCIAL STATEMENTS

(For the Year Ended December 31, 2017)

### Plan Description

#### *Plan Administration*

The Plan is a single-employer defined benefit pension plan administered by the Plan's Board of Trustees comprised of:

- a. The Mayor of the municipality,
- b. The city treasurer or, if there is no treasurer, the person who by law, charter provision, or ordinance performs the duty of city treasurer,
- c. Three Members of the fund to be selected by vote of the firefighters and retirees.

#### *Plan Membership as of December 31, 2016:*

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	750
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	7
Active Plan Members	990
	1,747

#### *Benefits Provided*

The Plan provides retirement, disability, termination and death benefits.

##### Normal Retirement:

Earlier of age 50 and 10 years of Service, or 25 years of Service, regardless of age.

Benefit: 3.30% of Average Monthly Compensation times Service (\$1,200 minimum). Effective July 1, 2012, the minimum benefit was increased to \$2,000 per month for all retirees and surviving spouses currently receiving normal or disability retirement benefits which commenced prior to January 1, 1994.

##### Early Retirement:

Earlier of age 45 and 10 years of Service, or 20 years of Service, regardless of age.

Benefit: Same for Normal Retirement as shown above. Members who retire under Early Retirement are not eligible to receive any COLA adjustments until the date they would have met Normal Retirement eligibility requirements.

##### Vesting:

Schedule: 100% after 10 years of Service.

Benefit Amount: Member will receive his (her) accrued benefit payable at age 50 or the date they would have completed 25 years of Service had they remained employed.

Non-vested members receive a refund of member contributions accumulated with 5.0% interest.

##### Disability:

Disability preventing the Member from performing the duties of a firefighter during the two and one-half years after becoming disabled or any employment after the two and one-half years after becoming disabled.

Accrued benefit at date of disability, but not less than 66% of Average Monthly Compensation.

##### Death Benefits:

Surviving Spouse of Member: 75% of Member's accrued benefit at date of death, but not less than 49.5% of Average Monthly Compensation.

Dependent Children of Member (with Surviving Spouse): Each child is entitled to 15% of Member's accrued benefit at date of death, but not less than 9.9% of Average Monthly Compensation.

Dependent Children of Member (with no Surviving Spouse): 75% of Member's accrued benefit at date of death, but not less than 49.5% of Average Monthly Compensation, split equally among each dependent child.

##### Cost of Living Adjustment:

Eligibility: Normal Retirement

Amount: Determined by the actuary if providing a COLA will not impair financial stability of the Fund.

#### *Contributions*

Member Contributions: 18.70% of Salary.

City Contributions: 22.05% of payroll.

## Investments

*Investment Policy:*

The following was the Board's adopted asset allocation policy as of March 2018:

<u>Asset Class</u>	<u>Target Allocation</u>
Public Domestic Equity	20%
Public Foreign Equity	22%
Private Equity Fund of Funds	15%
Investment Grade Bonds	13%
TIPS	5%
High Yield/Bank Loans	5%
Emerging Market Debt	7%
Core Real Estate	5%
Non-Core Real Estate	5%
Natural Resources	3%
<u>Total</u>	<u>100%</u>

*Concentrations:*

The Plan did not hold investments in any one organization that represent 5 percent or more of the Pension Plan's Fiduciary Net Position.

*Rate of Return:*

For the year ended December 31, 2017, the annual money-weighted rate of return on Pension Plan investments, net of Pension Plan investment expense, was 17.29 percent.

The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Deferred Retirement Option Program*Retroactive DROP*

Eligibility: Satisfaction of Early or Normal Retirement Eligibility.

Participation Period: Upon election to retroactively enter DROP, the Retro DROP period will not exceed 84 months.

Rate of Return: 5.0%, compounded annually, on monthly benefits that would have been deposited into a DROP account and Member contributions deposited into the fund between the effective DROP entry date and the actual date of termination.

The DROP balance as December 31, 2017 is \$86,322,683.

## NET PENSION LIABILITY OF THE SPONSOR

The components of the Net Pension Liability of the Sponsor on December 31, 2017 were as follows:

Total Pension Liability	\$1,038,800,829
Plan Fiduciary Net Position	\$ (953,798,227)
Sponsor's Net Pension Liability	<u>\$ 85,002,602</u>
Plan Fiduciary Net Position as a percentage of Total Pension Liability	91.82%

*Actuarial Assumptions:*

The Total Pension Liability was determined by an actuarial valuation as of December 31, 2016 updated to December 31, 2017 using the following actuarial assumptions:

Inflation	3.50%
General Wage Inflation	3.00%
Salary Increases	1.00% - 6.00%
Discount Rate	7.70%
Investment Rate of Return	7.70%

Mortality Rates Healthy Lives: RP-2000 (Fully Generational using Scale AA) set back two years for males and females - Sex distinct. The assumed rates of mortality sufficiently accommodate expected mortality improvements.

Mortality Rates Disabled Lives: RP2000 Disability Mortality Table.

The most recent actuarial experience study used to review the other significant assumptions was dated June 15, 2015.

The Long-Term Expected Rate of Return on Pension Plan investments can be determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of Pension Plan investment expenses and inflation) are developed for each major asset class.

For 2017, the inflation rate assumption of the investment advisor was 2.70%.

These ranges are combined to produce the Long-Term Expected Rate of Return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Best estimates of arithmetic real rates of return for each major asset class included in the Pension Plan's target asset allocation as of March 2018 are summarized in the following table:

Asset Class	Long Term Expected Real Rate of Return
Public Domestic Equity	5.3%
Public Foreign Equity	6.9%
Private Equity Fund of Funds	5.6%
Investment Grade Bonds	1.1%
TIPS	0.8%
High Yield/Bank Loans	3.8%
Emerging Market Debt	3.6%
Core Real Estate	3.4%
Non-Core Real Estate	5.0%
Natural Resources	5.9%

Discount Rate:

The Discount Rate used to measure the Total Pension Liability was 7.70 percent.

The projection of cash flows used to determine the Discount Rate assumed that Plan Member contributions will be made at the current contribution rate and that Sponsor contributions will continue at the currently negotiated rate of 22.05% of payroll each year. Based on those assumptions, the Pension Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the Long-Term Expected Rate of Return on Pension Plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability.

For purpose of this valuation, the expected rate of return on pension plan investments is 7.70%; the municipal bond rate is 3.44% (based on the weekly rate closest to but not later than the measurement date of the Bond Buyer 20-Bond Index as published by the Bond Buyer); and the resulting single discount rate is 7.70%.

	1% Decrease	Current	1% Increase
	6.70%	Discount Rate	8.70%
		7.70%	
Sponsor's Net Pension Liability	\$ 189,653,027	\$ 85,002,602	\$ (3,088,422)

**SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS**  
Last 10 Years

	12/31/2017	12/31/2016	12/31/2015
Total Pension Liability			
Service Cost	23,830,495	24,322,417	23,309,543
Interest	75,812,099	70,892,708	66,404,730
Changes of benefit terms	8,963,689	5,491,908	-
Differences between Expected and Actual Experience	4,360,239	8,893,371	7,192,645
Changes of assumptions	-	-	-
Benefit Payments, including Refunds of Employee Contributions	(51,888,455)	(45,495,681)	(44,756,847)
Net Change in Total Pension Liability	61,078,067	64,104,723	52,150,071
Total Pension Liability - Beginning	977,722,762	913,618,039	861,467,968
Total Pension Liability - Ending (a)	<u>\$1,038,800,829</u>	<u>\$ 977,722,762</u>	<u>\$ 913,618,039</u>
Plan Fiduciary Net Position			
Contributions - Employer	19,242,205	19,103,891	19,222,329
Contributions - Employee	16,318,769	15,884,261	15,546,979
Net Investment Income	141,915,000	55,569,165	6,328,063
Benefit Payments, including Refunds of Employee Contributions	(51,888,455)	(45,495,681)	(44,756,847)
Administrative Expense	(1,399,488)	(662,501)	(562,687)
Net Change in Plan Fiduciary Net Position	124,188,031	44,399,135	(4,222,163)
Plan Fiduciary Net Position - Beginning	829,610,196	785,211,061	789,433,224
Plan Fiduciary Net Position - Ending (b)	<u>\$ 953,798,227</u>	<u>\$ 829,610,196</u>	<u>\$ 785,211,061</u>
Net Pension Liability - Ending (a) - (b)	<u>\$ 85,002,602</u>	<u>\$ 148,112,566</u>	<u>\$ 128,406,978</u>
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	91.82%	84.85%	85.95%
Covered Employee Payroll	\$ 87,266,236	\$ 86,638,961	\$ 87,836,040
Net Pension Liability as a percentage of Covered Employee Payroll	97.41%	170.95%	146.19%

**Notes to Schedule:***Changes of benefit terms:*

For measurement date 12/31/2017, amounts reported as changes of benefit terms resulted from a cost-of-living adjustment. Eligible retirees receive a 2.2% cost-of-living adjustment, effective January 1, 2018.

For measurement date 12/31/2016, amounts reported as changes of benefit terms resulted from a cost-of-living adjustment. Eligible retirees receive a 1.5% cost-of-living adjustment, effective January 1, 2017.

# SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS

Last 10 Years

	12/31/2014	12/31/2013
Total Pension Liability		
Service Cost	25,318,456	23,497,407
Interest	62,976,839	59,249,151
Changes of benefit terms	-	-
Differences between Expected and Actual Experience	-	-
Changes of assumptions	4,883,207	-
Benefit Payments, including Refunds of Employee Contributions	(37,992,903)	(34,943,917)
Net Change in Total Pension Liability	55,185,599	47,802,641
Total Pension Liability - Beginning	806,282,369	758,479,728
Total Pension Liability - Ending (a)	<u>\$ 861,467,968</u>	<u>\$ 806,282,369</u>
Plan Fiduciary Net Position		
Contributions - Employer	18,669,944	17,786,494
Contributions - Employee	14,659,946	14,000,514
Net Investment Income	42,005,227	101,289,167
Benefit Payments, including Refunds of Employee Contributions	(37,992,903)	(34,943,917)
Administrative Expense	(530,816)	(363,050)
Net Change in Plan Fiduciary Net Position	36,811,398	97,769,208
Plan Fiduciary Net Position - Beginning	752,621,826	654,852,618
Plan Fiduciary Net Position - Ending (b)	<u>\$ 789,433,224</u>	<u>\$ 752,621,826</u>
Net Pension Liability - Ending (a) - (b)	<u>\$ 72,034,744</u>	<u>\$ 53,660,543</u>
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	91.64%	93.34%
Covered Employee Payroll	\$ 84,670,948	\$ 83,279,101
Net Pension Liability as a percentage of Covered Employee Payroll	85.08%	64.43%

## Notes to Schedule:

### *Changes of assumptions:*

For measurement date 12/31/2014, amounts reported as changes of assumptions resulted from an actuarial experience study dated June 15, 2015, below a brief overview of the changes:

- A "fresh-start" on the actuarial asset value has been implemented. For all future valuations, the asset valuation method will utilize a new smoothing technique.
- The investment return assumption has been decreased from 7.75% to 7.70% per year compounded annually, net of all expenses.
- The general wage inflation rate has been decreased from 3.5% to 3.0% per
- The service-based table attributable to merit and longevity salary increases
- The Retro-DROP election assumptions have been amended.
- The withdrawal rates have been amended.
- The assumed spousal age difference has been amended.

## SCHEDULE OF CONTRIBUTIONS

### Last 10 Years

Fiscal Year Ended	Actuarially Determined Contribution	Contributions in relation to the Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered Employee Payroll	Contributions as a percentage of Covered Employee Payroll
12/31/2017	N/A	N/A	N/A	\$ 87,266,236	22.05%
12/31/2016	N/A	N/A	N/A	\$ 86,638,961	22.05%
12/31/2015	N/A	N/A	N/A	\$ 87,836,040	21.36%
12/31/2014	N/A	N/A	N/A	\$ 84,670,948	21.36%
12/31/2013	N/A	N/A	N/A	\$ 83,279,101	21.36%

#### Notes to Schedule

Methods and assumptions used to determine liabilities:

Mortality Rates - Healthy Lives	RP-2000 (Fully Generational using Scale AA) set back two years for males and females - Sex Distinct. The assumed rates of mortality sufficiently accommodate expected mortality improvements.
Mortality Rates - Disabled Lives	RP2000 Disability Mortality Table.
Retirement Elections:	See tables on following page. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.
Termination Rates:	See tables below. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.
Disability Rates:	See tables on following pages. These assumptions were reviewed in conjunction with an actuarial experience study dated June 15, 2015.
Interest Rate:	7.70% per year, compounded annually, net of all expenses. This is supported by the target asset allocation of the trust and the expected long-term return by asset class.
Salary Increases:	See tables on following page. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.
General Wage Inflation:	3.00% per year. This assumption was approved in conjunction with an actuarial experience study dated June 15, 2015.
Inflation:	3.50% per year. This is reasonable based upon long-term historical experience.
Payroll Growth:	3.50% per year for amortization of the Unfunded Actuarial Accrued Liability. This is reasonable based upon long-term historical experience.
Asset Valuation Method:	All assets are valued at market value with an adjustment to uniformly spread investment gains and losses (as measured by actual market value investment return against expected market value investment return) over a five-year period.
Marital Status:	100% of actives are assumed to be married at time of benefit commencement. Females are assumed to be 4 years younger than Males. Additionally, 50% are assumed to have dependent children. The age of the youngest child is assumed to be one year. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method.

Termination Rates:	Years of Service	Termination Probability
	0-4	1.0%
	5-13	0.5%
	14+	0.0%

Retirement Rates:	Number of Years After First	Probability of Retirement
	Eligibility for Early Retirement	
	0	2.0%
	1	2.0%
	2	2.0%
	3	2.0%
	4	2.0%
	5	5.0%
	6	7.5%
	7	7.5%
	8	10.0%
	9	16.7%
	10	16.7%
	11	16.7%
	12	20.0%
	13	20.0%
	14	30.0%
	15	40.0%
	16	50.0%
	17	75.0%
	18	100.0%

Retro-DROP Elections:	Number of Years After First Eligibility for Early Retirement	No-DROP Elected	Duration 1 Election	Duration 2 Election
	0	90%	0.5 years (10%)	n/a
	1	50%	1 year (50%)	n/a
	2	50%	1 year (25%)	2 years (25%)
	3	50%	1 year (25%)	2 years (25%)
	4	20%	1 year (60%)	3 years (20%)
	5	20%	2 years (40%)	4 years (40%)
	6	20%	2 years (60%)	5 years (20%)
	7	20%	2 years (50%)	5 years (30%)
	8	20%	3 years (60%)	6 years (20%)
	9	10%	3 years (50%)	6 years (40%)
	10	10%	3 years (50%)	6 years (40%)
	11	10%	3 years (60%)	6 years (30%)
	12	10%	3 years (75%)	6 years (15%)
	13	10%	3 years (40%)	6 years (50%)
	14	10%	3 years (40%)	6 years (50%)
	15	10%	3 years (20%)	6 years (70%)
	16	10%	3 years (20%)	6 years (70%)
	17	10%	3 years (20%)	6 years (70%)
	18	10%	3 years (20%)	6 years (70%)

## GASB 67

Disability Rate Table:

Age	Probability of Disablement
20	0.014%
25	0.019%
30	0.031%
35	0.052%
40	0.092%
45	0.209%
50	0.379%
55	0.490%
60	0.911%

% Increase in Salary\*:

Years of Service	Increase
0	6.00%
1	8.50%
2	7.50%
3	4.00%
4	1.00%
5	5.00%
10	1.50%
15	1.50%
20	5.50%
21+	1.00%

\* Expected increase in salary in addition to general wage inflation assumption.

**SCHEDULE OF INVESTMENT RETURNS**  
Last 10 Years

Fiscal Year Ended	Annual Money-Weighted Rate of Return Net of Investment Expense
12/31/2017	17.29%
12/31/2016	7.13%
12/31/2015	0.81%
12/31/2014	5.60%
12/31/2013	13.30%

## NOTES TO THE FINANCIAL STATEMENTS

(For the Year Ended September 30, 2018)

### General Information about the Pension Plan

#### *Plan Description*

The Plan is a single-employer defined benefit pension plan administered by the Plan's Board of Trustees comprised of:

- a. The Mayor of the municipality,
- b. The city treasurer or, if there is no treasurer, the person who by law, charter provision, or ordinance performs the duty of city treasurer,
- c. Three Members of the fund to be selected by vote of the firefighters and retirees.

A person who begins service as a firefighter in a municipality to which this Act applies and who is not ineligible for Membership in the fund becomes a member of the fund as a condition of that person's appointment.

#### *Plan Membership as of December 31, 2016:*

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	750
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	7
Active Plan Members	990
	1,747

#### *Benefits Provided*

The Plan provides retirement, disability, termination and death benefits.

##### Normal Retirement:

Earlier of age 50 and 10 years of Service, or 25 years of Service, regardless of age.

Benefit: 3.30% of Average Monthly Compensation times Service (\$1,200 minimum). Effective July 1, 2012, the minimum benefit was increased to \$2,000 per month for all retirees and surviving spouses currently receiving normal or disability retirement benefits which commenced prior to January 1, 1994.

##### Early Retirement:

Earlier of age 45 and 10 years of Service, or 20 years of Service, regardless of age.

Benefit: Same for Normal Retirement as shown above. Members who retire under Early Retirement are not eligible to receive any COLA adjustments until the date they would have met Normal Retirement eligibility requirements.

##### Vesting:

Schedule: 100% after 10 years of Service.

Benefit Amount: Member will receive his (her) accrued benefit payable at age 50 or the date they would have completed 25 years of Service had they remained employed.

Non-vested members receive a refund of member contributions accumulated with 5.0% interest.

##### Disability:

Disability preventing the Member from performing the duties of a firefighter during the two and one-half years after becoming disabled or any employment after the two and one-half years after becoming disabled.

Accrued benefit at date of disability, but not less than 66% of Average Monthly Compensation.

##### Death Benefits:

Surviving Spouse of Member: 75% of Member's accrued benefit at date of death, but not less than 49.5% of Average Monthly Compensation.

Dependent Children of Member (with Surviving Spouse): Each child is entitled to 15% of Member's accrued benefit at date of death, but not less than 9.9% of Average Monthly Compensation.

Dependent Children of Member (with no Surviving Spouse): 75% of Member's accrued benefit at date of death, but no less than 49.5% of Average Monthly Compensation, split equally among each dependent child.

##### Cost of Living Adjustment:

Eligibility: Normal Retirement

Amount: Determined by the actuary if providing a COLA will not impair financial stability of the Fund.

## GASB 68

### Contributions

Member Contributions: 18.70% of Salary.

City Contributions: 22.05% of payroll.

### Net Pension Liability

The measurement date is December 31, 2017.

The measurement period for the pension expense was December 31, 2016 to December 31, 2017.

The reporting period is September 30, 2017 through September 30, 2018.

The Sponsor's Net Pension Liability was measured as of December 31, 2017.

The Total Pension Liability used to calculate the Net Pension Liability was determined as of that date.

### Actuarial Assumptions:

The Total Pension Liability was determined by an actuarial valuation as of December 31, 2016 updated to December 31, 2017 using the following actuarial assumptions:

Inflation	3.50%
Salary Increases	1.00% - 6.00%
Discount Rate	7.70%
Investment Rate of Return	7.70%

Mortality Rates Healthy Lives: RP-2000 (Fully Generational using Scale AA) set back two years for males and females - Sex distinct.

The assumed rates of mortality sufficiently accommodate expected mortality improvements.

Mortality Rates Disabled Lives: RP2000 Disability Mortality Table.

The most recent actuarial experience study used to review the other significant assumptions was dated June 15, 2015.

The Long-Term Expected Rate of Return on Pension Plan investments can be determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of Pension Plan investment expenses and inflation) are developed for each major asset class.

For 2017, the inflation rate assumption of the investment advisor was 2.70%.

These ranges are combined to produce the Long-Term Expected Rate of Return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

Best estimates of arithmetic real rates of return for each major asset class included in the Pension Plan's target asset allocation as of March 2018 are summarized in the following table:

Asset Class	Target Allocation	Long Term Expected Real Rate of Return
Public Domestic Equity	20%	5.3%
Public Foreign Equity	22%	6.9%
Private Equity Fund of Funds	15%	5.6%
Investment Grade Bonds	13%	1.1%
TIPS	5%	0.8%
High Yield/Bank Loans	5%	3.8%
Emerging Market Debt	7%	3.6%
Core Real Estate	5%	3.4%
Non-Core Real Estate	5%	5.0%
Natural Resources	3%	5.9%
Total	100%	

### Discount Rate:

The Discount Rate used to measure the Total Pension Liability was 7.70 percent.

The projection of cash flows used to determine the Discount Rate assumed that Plan Member contributions will be made at the current contribution rate and that Sponsor contributions will continue at the currently negotiated rate of 22.05% of payroll each year. Based on those assumptions, the Pension Plan's Fiduciary Net Position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the Long-Term Expected Rate of Return on Pension Plan investments was applied to all periods of projected benefit payments to determine the Total Pension Liability.

For purpose of this valuation, the expected rate of return on pension plan investments is 7.70%; the municipal bond rate is 3.44% (based on the weekly rate closest to but not later than the measurement date of the Bond Buyer 20-Bond Index as published by the Bond Buyer); and the resulting single discount rate is 7.70%.

## CHANGES IN NET PENSION LIABILITY

	Increase (Decrease)		
	Total Pension Liability	Plan Fiduciary Net Position	Net Pension Liability
	(a)	(b)	(a)-(b)
Reporting Period Ending September 30, 2017	\$ 977,722,762	\$ 829,610,196	\$ 148,112,566
Changes for a Year:			
Service Cost	23,830,495	-	23,830,495
Interest	75,812,099	-	75,812,099
Differences between Expected and Actual Experience	4,360,239	-	4,360,239
Changes of assumptions	-	-	-
Changes of benefit terms	8,963,689	-	8,963,689
Contributions - Employer	-	19,242,205	(19,242,205)
Contributions - Employee	-	16,318,769	(16,318,769)
Contributions - Buy Back	-	-	-
Net Investment Income	-	141,915,000	(141,915,000)
Benefit Payments, including Refunds of Employee Contributions	(51,888,455)	(51,888,455)	-
Administrative Expense	-	(1,399,488)	1,399,488
Net Changes	61,078,067	124,188,031	(63,109,964)
Reporting Period Ending September 30, 2018	\$1,038,800,829	\$ 953,798,227	\$ 85,002,602

*Sensitivity of the Net Pension Liability to changes in the Discount Rate.*

	Current Discount		
	1% Decrease	Rate	1% Increase
	6.70%	7.70%	8.70%
Sponsor's Net Pension Liability	\$ 189,653,027	\$ 85,002,602	\$ (3,088,422)

*Pension Plan Fiduciary Net Position.*

Detailed information about the pension Plan's Fiduciary Net Position is available in a separately issued Plan financial report.

**FINAL PENSION EXPENSE AND DEFERRED OUTFLOWS OF RESOURCES AND  
DEFERRED INFLOWS OF RESOURCES RELATED TO PENSIONS  
FISCAL YEAR SEPTEMBER 30, 2016**

For the year ended September 30, 2017, the Sponsor has recognized a Pension Expense of \$42,859,568.

On September 30, 2017, the Sponsor reported Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between Expected and Actual Experience	13,176,184	-
Changes of assumptions	3,255,470	-
Net difference between Projected and Actual Earnings on Pension Plan investments	42,299,574	-
Employer contributions subsequent to the measurement date	19,104,704	-
Total	<u>\$ 77,835,932</u>	<u>\$ -</u>

The outcome of the Deferred Outflows of resources related to pensions resulting from Employer contributions subsequent to the measurement date has been recognized as a reduction of the Net Pension Liability in the year ended September 30, 2017.

Other amounts reported as Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions will be recognized in Pension Expense as follows:

Year ended September 30:	
2018	\$ 17,405,499
2019	\$ 17,405,500
2020	\$ 14,256,160
2021	\$ 3,445,738
2022	\$ 2,553,330
Thereafter	\$ 3,665,001

**PRELIMINARY PENSION EXPENSE AND DEFERRED OUTFLOWS OF RESOURCES AND  
DEFERRED INFLOWS OF RESOURCES RELATED TO PENSIONS  
FISCAL YEAR SEPTEMBER 30, 2018**

For the year ended September 30, 2018, the Sponsor will recognize a Pension Expense of \$32,774,398.

On September 30, 2018, the Sponsor reported Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between Expected and Actual Experience	14,902,778	-
Changes of assumptions	2,712,891	-
Net difference between Projected and Actual Earnings on Pension Plan investments	-	35,526,598
Employer contributions subsequent to the measurement date	TBD	-
Total	<u>TBD</u>	<u>\$ 35,526,598</u>

The outcome of the Deferred Outflows of resources related to pensions resulting from Employer contributions subsequent to the measurement date will be recognized as a reduction of the Net Pension Liability in the year ended September 30, 2018.

Other amounts reported as Deferred Outflows of Resources and Deferred Inflows of Resources related to pensions will be recognized in Pension Expense as follows:

Year ended September 30:	
2019	\$ 2,284,890
2020	\$ (864,450)
2021	\$ (11,674,872)
2022	\$ (12,567,280)
2023	\$ 3,176,221
Thereafter	\$ 1,734,562

**SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS**  
Last 10 Fiscal Years

Reporting Period Ending Measurement Date	09/30/2018 12/31/2017	09/30/2017 12/31/2016	09/30/2016 12/31/2015
Total Pension Liability			
Service Cost	23,830,495	24,322,417	23,309,543
Interest	75,812,099	70,892,708	66,404,730
Changes of benefit terms	8,963,689	5,491,908	-
Differences between Expected and Actual Experience	4,360,239	8,893,371	7,192,645
Changes of assumptions	-	-	-
Benefit Payments, including Refunds of Employee Contributions	(51,888,455)	(45,495,681)	(44,756,847)
Net Change in Total Pension Liability	61,078,067	64,104,723	52,150,071
Total Pension Liability - Beginning	977,722,762	913,618,039	861,467,968
Total Pension Liability - Ending (a)	<u>\$1,038,800,829</u>	<u>\$ 977,722,762</u>	<u>\$ 913,618,039</u>
Plan Fiduciary Net Position			
Contributions - Employer	19,242,205	19,103,891	19,222,329
Contributions - Employee	16,318,769	15,884,261	15,546,979
Net Investment Income	141,915,000	55,569,165	6,328,063
Benefit Payments, including Refunds of Employee Contributions	(51,888,455)	(45,495,681)	(44,756,847)
Administrative Expense	(1,399,488)	(662,501)	(562,687)
Net Change in Plan Fiduciary Net Position	124,188,031	44,399,135	(4,222,163)
Plan Fiduciary Net Position - Beginning	829,610,196	785,211,061	789,433,224
Plan Fiduciary Net Position - Ending (b)	<u>\$ 953,798,227</u>	<u>\$ 829,610,196</u>	<u>\$ 785,211,061</u>
Net Pension Liability - Ending (a) - (b)	<u>\$ 85,002,602</u>	<u>\$ 148,112,566</u>	<u>\$ 128,406,978</u>
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	91.82%	84.85%	85.95%
Covered Employee Payroll	\$ 87,266,236	\$ 86,638,961	\$ 87,836,040
Net Pension Liability as a percentage of Covered Employee Payroll	97.41%	170.95%	146.19%

**Notes to Schedule:***Changes of benefit terms:*

For measurement date 12/31/2017, amounts reported as changes of benefit terms resulted from a cost-of-living adjustment. Eligible retirees receive a 2.2% cost-of-living adjustment, effective January 1, 2018.

For measurement date 12/31/2016, amounts reported as changes of benefit terms resulted from a cost-of-living adjustment. Eligible retirees receive a 1.5% cost-of-living adjustment, effective January 1, 2017.

# SCHEDULE OF CHANGES IN NET PENSION LIABILITY AND RELATED RATIOS

Last 10 Fiscal Years

Reporting Period Ending Measurement Date	09/30/2015 12/31/2014	09/30/2014 12/31/2013
Total Pension Liability		
Service Cost	25,318,456	23,497,407
Interest	62,976,839	59,249,151
Changes of benefit terms	-	-
Differences between Expected and Actual Experience	-	-
Changes of assumptions	4,883,207	-
Benefit Payments, including Refunds of Employee Contributions	(37,992,903)	(34,943,917)
Net Change in Total Pension Liability	55,185,599	47,802,641
Total Pension Liability - Beginning	806,282,369	758,479,728
Total Pension Liability - Ending (a)	<u>\$ 861,467,968</u>	<u>\$ 806,282,369</u>
Plan Fiduciary Net Position		
Contributions - Employer	18,669,944	17,786,494
Contributions - Employee	14,659,946	14,000,514
Net Investment Income	42,005,227	101,289,167
Benefit Payments, including Refunds of Employee Contributions	(37,992,903)	(34,943,917)
Administrative Expense	(530,816)	(363,050)
Net Change in Plan Fiduciary Net Position	36,811,398	97,769,208
Plan Fiduciary Net Position - Beginning	752,621,826	654,852,618
Plan Fiduciary Net Position - Ending (b)	<u>\$ 789,433,224</u>	<u>\$ 752,621,826</u>
Net Pension Liability - Ending (a) - (b)	<u>\$ 72,034,744</u>	<u>\$ 53,660,543</u>
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	91.64%	93.34%
Covered Employee Payroll	\$ 84,670,948	\$ 83,279,101
Net Pension Liability as a percentage of Covered Employee Payroll	85.08%	64.43%

## Notes to Schedule:

### *Changes of assumptions:*

For measurement date 12/31/2014, amounts reported as changes of assumptions resulted from an actuarial experience study dated June 15, 2015, below a brief overview of the changes:

- A "fresh-start" on the actuarial asset value has been implemented. For all future valuations, the asset valuation method will utilize a new smoothing technique.
- The investment return assumption has been decreased from 7.75% to 7.70% per year compounded annually, net of all expenses.
- The general wage inflation rate has been decreased from 3.5% to 3.0% per year.
- The service-based table attributable to merit and longevity salary increases has been amended.
- The Retro-DROP election assumptions have been amended.
- The withdrawal rates have been amended.
- The assumed spousal age difference has been amended.

## SCHEDULE OF CONTRIBUTIONS

Last 10 Fiscal Years

Fiscal Year Ended	Actuarially Determined Contribution	Contributions in relation to the Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered Employee Payroll	Contributions as a percentage of Covered Employee Payroll
09/30/2018	N/A	N/A	N/A	TBD by City	22.05%
09/30/2017	N/A	N/A	N/A	TBD by City	22.05%
09/30/2016	N/A	N/A	N/A	TBD by City	22.05%
09/30/2015	N/A	N/A	N/A	TBD by City	22.05%

Notes to Schedule

Methods and assumptions used to determine liabilities:

Mortality Rates - Healthy Lives	RP-2000 (Fully Generational using Scale AA) set back two years for males and females - Sex Distinct. The assumed rates of mortality sufficiently accommodate expected mortality improvements.	
Mortality Rates - Disabled Lives	RP2000 Disability Mortality Table.	
Retirement Elections:	See tables on following page. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.	
Termination Rates:	See tables below. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.	
Disability Rates:	See tables on following pages. These assumptions were reviewed in conjunction with an actuarial experience study dated June 15, 2015.	
Interest Rate:	7.70% per year, compounded annually, net of all expenses. This is supported by the target asset allocation of the trust and the expected long-term return by asset class.	
Salary Increases:	See tables on following page. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.	
General Wage Inflation:	3.00% per year. This assumption was approved in conjunction with an actuarial experience study dated June 15, 2015.	
Inflation:	3.50% per year. This is reasonable based upon long-term historical experience.	
Payroll Growth:	3.50% per year	
Asset Valuation Method:	All assets are valued at market value with an adjustment to uniformly spread investment gains and losses (as measured by actual market value investment return against expected market value investment return) over a five-year period.	
Marital Status:	100% of actives are assumed to be married at time of benefit commencement. Females are assumed to be 4 years younger than Males. Additionally, 50% are assumed to have dependent children. The age of the youngest child is assumed to be one year. These assumptions were approved in conjunction with an actuarial experience study dated June 15, 2015.	
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method.	
Termination Rates:	Years of Service	Termination Probability
	0-4	1.00%
	5-13	0.50%
	14+	0.00%

## Retirement Rates:

Number of Years After First Eligibility for Early Retirement	Probability of Retirement
0	2.00%
1	2.00%
2	2.00%
3	2.00%
4	2.00%
5	5.00%
6	7.50%
7	7.50%
8	10.00%
9	16.70%
10	16.70%
11	16.70%
12	20.00%
13	20.00%
14	30.00%
15	40.00%
16	50.00%
17	75.00%
18	100.00%

## Retro-DROP Elections:

Years After First Eligibility for Early	No-DROP Elected	Duration 1 Election	Duration 2 Election
0	90%	0.5 years (10%)	n/a
1	50%	1 year (50%)	n/a
2	50%	1 year (25%)	2 years (25%)
3	50%	1 year (25%)	2 years (25%)
4	20%	1 year (60%)	3 years (20%)
5	20%	2 years (40%)	4 years (40%)
6	20%	2 years (60%)	5 years (20%)
7	20%	2 years (50%)	5 years (30%)
8	20%	3 years (60%)	6 years (20%)
9	10%	3 years (50%)	6 years (40%)
10	10%	3 years (50%)	6 years (40%)
11	10%	3 years (60%)	6 years (30%)
12	10%	3 years (75%)	6 years (15%)
13	10%	3 years (40%)	6 years (50%)
14	10%	3 years (40%)	6 years (50%)
15	10%	3 years (20%)	6 years (70%)
16	10%	3 years (20%)	6 years (70%)
17	10%	3 years (20%)	6 years (70%)
18	10%	3 years (20%)	6 years (70%)

## GASB 68

Disability Rate Table:

Age	Probability of Disablement
20	0.014%
25	0.019%
30	0.031%
35	0.052%
40	0.092%
45	0.209%
50	0.379%
55	0.490%
60	0.911%

% Increase in Salary\*:

Years of Service	Increase
0	6.00%
1	8.50%
2	7.50%
3	4.00%
4	1.00%
5	5.00%
10	1.50%
15	1.50%
20	5.50%
21+	1.00%

\* Expected increase in salary in addition to general wage inflation assumption.

## EXPENSE DEVELOPMENT AND AMORTIZATION SCHEDULES

**The following information is not required to be disclosed but is provided for informational purposes.**

**FINAL COMPONENTS OF PENSION EXPENSE**  
**FISCAL YEAR SEPTEMBER 30, 2017**

	Net Pension Liability	Deferred Inflows	Deferred Outflows	Pension Expense
Beginning balance	\$ 128,406,978	\$ -	\$ 76,775,278	\$ -
Employer Contributions made after 12/31/2016	-	-	19,104,704	-
Total Pension Liability Factors:				
Service Cost	24,322,417	-	-	24,322,417
Interest	70,892,708	-	-	70,892,708
Changes in benefit terms	5,491,908	-	-	5,491,908
Differences between Expected and Actual Experience with regard to economic or demographic assumptions	8,893,371	-	8,893,371	-
Current year amortization of experience difference	-	-	(2,010,752)	2,010,752
Change in assumptions about future economic or demographic factors or other inputs	-	-	-	-
Current year amortization of change in assumptions	-	-	(542,579)	542,579
Benefit Payments, including Refunds of Employee Contributions	(45,495,681)	-	-	-
Net change	64,104,723	-	25,444,744	103,260,364
Plan Fiduciary Net Position:				
Contributions - Employer	19,103,891	-	(13,993,961)	-
Contributions - Employee	15,884,261	-	-	(15,884,261)
Projected Net Investment Income	60,031,206	-	-	(60,031,206)
Difference between projected and actual earnings on Pension Plan investments	(4,462,041)	-	4,462,041	-
Current year amortization	-	-	(14,852,170)	14,852,170
Benefit Payments, including Refunds of Employee Contributions	(45,495,681)	-	-	-
Administrative Expenses	(662,501)	-	-	662,501
Net change	44,399,135	-	(24,384,090)	(60,400,796)
Ending Balance	\$ 148,112,566	\$ -	\$ 77,835,932	\$ 42,859,568

**PRELIMINARY COMPONENTS OF PENSION EXPENSE**  
**FISCAL YEAR SEPTEMBER 30, 2018**

	Net Pension Liability	Deferred Inflows	Deferred Outflows	Pension Expense
Beginning balance	\$ 148,112,566	\$ -	\$ 77,835,932	\$ -
Employer Contributions made after 12/31/2017	-	-	TBD*	-
Total Pension Liability Factors:				
Service Cost	23,830,495	-	-	23,830,495
Interest	75,812,099	-	-	75,812,099
Changes in benefit terms	8,963,689	-	-	8,963,689
Differences between Expected and Actual Experience with regard to economic or demographic assumptions	4,360,239	-	4,360,239	-
Current year amortization of experience difference	-	-	(2,633,645)	2,633,645
Change in assumptions about future economic or demographic factors or other inputs	-	-	-	-
Current year amortization of change in assumptions	-	-	(542,579)	542,579
Benefit Payments, including Refunds of Employee Contributions	(51,888,455)	-	-	-
Net change	<u>61,078,067</u>	<u>-</u>	<u>1,184,015</u>	<u>111,782,507</u>
Plan Fiduciary Net Position:				
Contributions - Employer	19,242,205	-	(19,104,704)	-
Contributions - Employee	16,318,769	-	-	(16,318,769)
Projected Net Investment Income	63,197,497	-	-	(63,197,497)
Difference between projected and actual earnings on Pension Plan investments	78,717,503	78,717,503	-	-
Current year amortization	-	(15,743,499)	(14,852,168)	(891,331)
Benefit Payments, including Refunds of Employee Contributions	(51,888,455)	-	-	-
Administrative Expenses	(1,399,488)	-	-	1,399,488
Net change	<u>124,188,031</u>	<u>62,974,004</u>	<u>(33,956,872)</u>	<u>(79,008,109)</u>
Ending Balance	<u>\$ 85,002,602</u>	<u>\$ 62,974,004</u>	<u>TBD</u>	<u>\$ 32,774,398</u>

\* Employer Contributions subsequent to the measurement date made after December 31, 2017 but made on or before September 30, 2018 need to be added.

## AMORTIZATION SCHEDULE - INVESTMENT

Increase (Decrease) in Pension Expense Arising from the Recognition of the of Differences Between Projected and Actual Earnings on Pension Plan Investments

Plan Year Ending	Differences Between Projected and Actual Earnings	Recognition Period (Years)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
2014	\$ 15,746,691	5	\$ 3,149,338	\$ 3,149,338	\$ 3,149,338	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2015	\$ 54,052,112	5	\$ 10,810,423	\$ 10,810,422	\$ 10,810,422	\$ 10,810,422	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2016	\$ 4,462,041	5	\$ 892,409	\$ 892,408	\$ 892,408	\$ 892,408	\$ 892,408	\$ -	\$ -	\$ -	\$ -	\$ -
2017	\$ (78,717,503)	5	\$ -	\$ (15,743,499)	\$ (15,743,501)	\$ (15,743,501)	\$ (15,743,501)	\$ (15,743,501)	\$ -	\$ -	\$ -	\$ -
Net Increase (Decrease) in Pension Expense			\$ 14,852,170	\$ (891,331)	\$ (891,333)	\$ (4,040,671)	\$ (14,851,093)	\$ (15,743,501)	\$ -	\$ -	\$ -	\$ -

AMORTIZATION SCHEDULE - CHANGES OF ASSUMPTIONS

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Changes of Assumptions

Plan Year Ending	Changes of Assumptions	Recognition Period (Years)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
2014	\$ 4,883,207	9	\$ 542,579	\$ 542,579	\$ 542,579	\$ 542,578	\$ 542,578	\$ 542,578	\$ 542,578	\$ -	\$ -	\$ -
Net Increase (Decrease) in Pension Expense			\$ 542,579	\$ 542,579	\$ 542,579	\$ 542,578	\$ 542,578	\$ 542,578	\$ 542,578	\$ -	\$ -	\$ -

## AMORTIZATION SCHEDULE - EXPERIENCE

Increase (Decrease) in Pension Expense Arising from the Recognition of the Effects of Differences between Expected and Actual Experience

Plan Year Ending	Differences Between Expected and Actual Experience	Recognition Period (Years)	2017	2018	2019	2020	2021	2022	2023	2024	2025
2015	\$ 7,192,645	8	\$ 899,080	\$ 899,080	\$ 899,081	\$ 899,081	\$ 899,081	\$ 899,081	\$ 899,081	\$ -	\$ -
2016	\$ 8,893,371	8	\$ 1,111,672	\$ 1,111,672	\$ 1,111,672	\$ 1,111,671	\$ 1,111,671	\$ 1,111,671	\$ 1,111,671	\$ 1,111,671	\$ -
2017	\$ 4,360,239	7	\$ -	\$ 622,893	\$ 622,891	\$ 622,891	\$ 622,891	\$ 622,891	\$ 622,891	\$ 622,891	\$ -
Net Increase (Decrease) in Pension Expense			\$ 2,010,752	\$ 2,633,645	\$ 2,633,644	\$ 2,633,643	\$ 2,633,643	\$ 2,633,643	\$ 2,633,643	\$ 1,734,562	\$ -