



City of El Paso Employees Retirement Trust

Actuarial Valuation as of September 1, 2018

February 2019



February 6, 2019

Mr. Robert B. Ash
Pension Administrator
City of El Paso Employees' Retirement Trust
1039 Chelsea St.
El Paso, TX 79903

Dear Robert,

This report summarizes the results of the September 1, 2018 actuarial valuation of the City of El Paso Employees Retirement Trust (Plan).

The primary purposes of the valuation are to (i) determine the adequacy of the current contribution rate of the City, (ii) describe the current financial condition of the Plan, and (iii) analyze changes in the Plan's condition since the last valuation.

Valuations are prepared biennially, as of September 1 of even years. September 1 is the first day of the Plan's plan year. Interim valuations are prepared as of September 1 of odd years based on updated assets and a roll-forward of liabilities from the previous valuation.

Use of this report for any other purpose or by anyone other than the City and the Plan's auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting it to perform an advance review of any statement, document, or filing based on information contained in this report. Buck will accept no liability for any such statement, document or filing made without prior review by Buck.

The actuarial valuation reflects the benefit and contribution provisions set forth in the Plan's statutes. A summary of the benefit provisions used in the valuation is presented in Schedule B. There were no changes in benefit provisions since the previous valuation.

The actuarial assumptions and methods used in the valuation are presented in Schedule C. In my opinion, the actuarial assumptions are reasonable, taking into account the experience of the Plan and reasonable long-term expectations, and represent my best estimate of the anticipated long-term experience under the Plan. The assumptions and methods are the same as those used in the previous valuation.

Member data for active, retired, and inactive members was supplied as of July 1, 2018 by the City. The City is solely responsible for the accuracy and comprehensiveness of the data. We did not verify the data submitted but did perform tests for consistency and reasonableness. Asset information was supplied by the City.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. An analysis of the potential range of such future differences is beyond the scope of this valuation.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the Plan if the Plan were to settle (i.e., purchase annuities) for all or a portion of its liabilities.

This report was prepared under my supervision and in accordance with all applicable Actuarial Standards of Practice. I am a Fellow of the Society of Actuaries, an Enrolled Actuary, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

I am available to discuss this report with you at your convenience. I can be reached at (602) 803-6174.

Buck Global, LLC (Buck)

A handwritten signature in black ink, appearing to read 'DK', is positioned above the printed name and title of the signatory.

David J. Kershner, FSA, EA, MAAA, FCA
Principal

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Section 1 – Summary of Results

	September 1, 2018	September 1, 2016
Membership ¹		
Active	4,345	4,217
Terminated with deferred benefits ²	181	141
Retired paid from Plan ³	3,174	2,863
Compensation		
Total	\$ 167,225,529	\$ 156,336,028
Average	\$ 38,487	\$ 37,073
Assets		
Market value	\$ 820,416,288	\$ 723,103,443
Actuarial value	\$ 822,926,030	\$ 749,026,818
Valuation Results		
Actuarial accrued liability (AAL)	\$ 1,024,379,167	\$ 945,772,098
Assets (actuarial)	\$ 822,926,030	\$ 749,026,818
Funded ratio (actuarial)	80.3%	79.2%
Unfunded actuarial accrued liability (UAAL)	\$ 201,453,137	\$ 196,745,280
UAAL funding period	14 years	17 years
30-year Funding Cost for the City		
Normal cost rate	2.99%	3.24%
UAAL amortization rate	<u>6.87%</u>	<u>7.17%</u>
Total rate	9.86%	10.41%

¹ Census data is as of July 1 preceding the valuation date.

² Excludes terminated members entitled to refunds of contributions paid after July 1.

³ Excludes retirees for whom annuities were purchased from Prudential, but whose cost-of-living increases are paid by the Plan.

Section 2 – Comments on the Valuation

Overview

The overall funding of the Plan has improved since the September 1, 2016 valuation. This is mainly due to a combination of lower-than-expected salary increases and better-than-expected asset returns over the past two-year period.

Section 3 shows in more detail the changes to the UAAL, the funding cost, and the UAAL funding period based on the current contribution rates.

Funding Status

There are two significant measures of the funding status of the Plan. The first is the 30-year funding cost. This is the City contribution rate required to pay the normal cost and to amortize the UAAL over a 30-year period. This rate is currently 9.86% of total salary compared with the City's actual contribution rate of 14.05% of total salary. Section 3 shows a reconciliation of the changes between the 2016 and 2018 figures.

The other measure is the UAAL funding period. This is the length of time in years that will be required to amortize the current UAAL based on the current contribution rates. This period is currently 14 years, compared to 17 years in 2016.

Benefit Provisions

Schedule B summarizes the benefit provisions of the Plan. The provisions were changed effective September 1, 2011 so that Members of the Plan prior to September 1, 2011 are eligible for the First Tier Plan, and Members of the Plan on or after September 1, 2011 are eligible for the Second Tier Plan. There are no significant benefits which were not taken into account in this valuation. There were no changes to the benefit provisions since the previous valuation.

Actuarial Assumptions and Methods

Schedule C describes the assumptions and methods used for this valuation. An experience study was performed in 2016. Based on that study, the Board adopted assumption changes in 2016 to better reflect anticipated experience of the Plan. There were no changes to the actuarial assumptions or methods since the previous valuation.

Financial Data

The financial data used in this report was provided by the City.

Section 5 shows a reconciliation of the Plan's assets between 2016 and 2018, and the development of the actuarial value of assets (AVA). To minimize volatility in contribution rates, we use an adjusted market value, which phases in market gains and losses (compared to the assumed investment return rate) over five years. The market returns for the two years since the last valuation were 10.4% and 8.4%, while the actuarial returns were 7.7% and 7.4%.

Membership Statistics

Data on active and retired members was supplied by the City as of July 1, 2018. The active membership increased from 4,217 to 4,345 between 2016 and 2018, a 3.0% increase over the two-year period, while payroll grew from \$156.3 million to \$167.2 million over the same period, a 7.0% increase. Schedule A shows a summary of the membership data used in the valuation.

Section 3 – Actuarial Funding Requirements

Actuarial Liabilities, Costs and Funding Period

	September 1, 2018	September 1, 2016
1. Covered Payroll	\$ 167,225,529	\$ 156,336,028
2. Actuarial present value of future pay	\$ 1,318,186,404	\$ 1,204,554,432
3. Current contribution rates		
a. City	14.05%	14.05%
b. Member	<u>8.95%</u>	<u>8.95%</u>
c. Total	23.00%	23.00%
4. Normal cost rate		
a. Total (before adjustment for overtime)	12.42%	12.68%
b. Total (after adjustment for overtime)	11.94%	12.19%
c. Member contribution rate	8.95%	8.95%
d. Employer normal cost rate (4b – 4c)	2.99%	3.24%
5. Actuarial present value of future benefits	\$ 1,188,097,918	\$ 1,098,509,600
6. Actuarial present value of future normal costs (4a x 2)	\$ 163,718,751	\$ 152,737,502
7. Actuarial accrued liability (5 – 6)	\$ 1,024,379,167	\$ 945,772,098
8. Actuarial value of assets	\$ 822,926,030	\$ 749,026,818
9. Unfunded actuarial accrued liability (UAAL) (7 – 8)	\$ 201,453,137	\$ 196,745,280
10. 30-year funding cost for City		
a. Employer normal cost rate (4d)	2.99%	3.24%
b. UAAL amortization rate	<u>6.87%</u>	<u>7.17%</u>
c. Total	9.86%	10.41%
11. Margin over/(under) 30-year cost (3a – 10c)	4.19%	3.64%
12. Funding period to amortize UAAL	14 years	17 years

Section 3 – Actuarial Funding Requirements (continued)

Analysis of Change in UAAL

1. UAAL as of September 1, 2016	\$ 196,745,280
2. Changes due to:	
a. Expected increase/(decrease)	(6,193,226)
b. Actual contributions greater than expected	(6,201,749)
c. Other changes including liability experience	18,075,155
d. Asset experience	(972,323)
e. Assumption Changes	<u>0</u>
Total Changes	\$ 4,707,857
3. UAAL as of September 1, 2018	\$ 201,453,137

Analysis of Change in Funding Cost

1. 30-year funding cost as of September 1, 2016	10.41%
2. Changes due to:	
a. Actual contributions greater than expected	(0.21)%
b. Liability experience	(0.31)%
c. Asset experience	(0.03)%
d. Assumption changes	<u>0.00%</u>
Total	(0.55)%
3. 30-year funding cost as of September 1, 2018	9.86%

Section 3 – Actuarial Funding Requirements (continued)

Analysis of Change in Funding Period

1. Funding period as of September 1, 2016	17 years
2. Changes due to:	
a. Passage of time	(2)
b. Actual contributions greater than expected	(1)
c. Liability experience	1
d. Asset experience	(1)
e. Assumption changes	<u>0</u>
Total	(3)
3. Funding period as of September 1, 2018	14 years

Section 4 – Historical Funding Information

Historical Funding Detail

Valuation Date	Actuarial Value of Assets	Actuarial Accrued Liability (AAL) - Entry Age	Unfunded AAL (UAAL)	Funded Ratio	Covered Payroll	UAAL as a Percentage of Covered Payroll
September 1, 2008	552.8	631.6	78.8	87.5%	136.5	57.7%
September 1, 2010	569.7	710.0	140.3	80.2%	143.1	98.0%
September 1, 2012	581.7	788.2	206.5	73.8%	147.7	139.8%
September 1, 2014	663.1	859.7	196.7	77.1%	153.6	128.0%
September 1, 2016	749.0	945.8	196.7	79.2%	156.3	125.9%
September 1, 2018	822.9	1,024.4	201.5	80.3%	167.2	120.5%

Schedule of Employer Contributions

Period Ending	Annual Required Contribution	Percentage Contributed
August 31, 2009	17,245,402	100%
August 31, 2010	17,626,236	100%
August 31, 2011	18,356,531	98%
August 31, 2012	19,605,418	100%
August 31, 2013	21,075,292	97%
August 31, 2014	22,649,727	96%
August 31, 2015	22,916,913	100%
August 31, 2016	23,370,111	100%
August 31, 2017	25,327,071	100%
August 31, 2018	25,651,488	100%

Section 5 – Summary of Asset Information

Reconciliation of Fund Assets

	Period Ending	
	August 31, 2018	August 31, 2017
1. Value of fund at beginning of period	\$ 776,552,623	\$ 723,103,443
2. Contributions		
a. City	\$ 25,651,488	\$ 25,327,071
b. Member	<u>15,540,713</u>	<u>15,154,341</u>
c. Total	\$ 41,192,201	\$ 40,481,412
3. Benefit payments	(61,114,382)	(61,077,565)
4. Investment earnings	65,481,720	75,370,973
5. Administrative expenses	(1,695,874)	(1,325,640)
6. Value of assets at end of period	\$ 820,416,288	\$ 776,552,623

Section 5 – Summary of Asset Information (continued)

Determination of Excess Investment Earnings to be Deferred

	Period Ending	
	August 31, 2018	August 31, 2017
1. Market value at beginning of period	\$ 776,552,623	\$ 723,103,443
2. Cash flows		
a. City contributions	\$ 25,651,488	\$ 25,327,071
b. Member contributions	15,540,713	15,154,341
c. Benefit payments	(58,224,939)	(57,972,792)
d. Refunds	<u>(2,889,443)</u>	<u>(3,104,773)</u>
e. Total	\$ (19,922,181)	\$ (20,596,153)
3. Weighted cash flows (2e x 50%)	\$ (9,961,091)	\$ (10,298,077)
4. Assets available (1 + 3)	\$ 766,591,532	\$ 712,805,366
5. Assumed investment return rate	7.50%	7.50%
6. Expected net return (4 x 5)	\$ 57,494,365	\$ 53,460,402
7. Actual net return		
a. Total investment return	\$ 65,481,720	\$ 75,370,973
b. Administrative expenses	<u>(1,695,874)</u>	<u>(1,325,640)</u>
c. Net return	\$ 63,785,846	\$ 74,045,333
8. Gains/(losses) subject to deferral (7c - 6)	\$ 6,291,481	\$ 20,584,931

Section 5 – Summary of Asset Information (continued)

Calculation of Actuarial Value of Assets

- 1. Market value of assets as of August 31, 2018 \$ 820,416,288
- 2. Deferral amounts

Year	Total Gain/(Loss)	Percent Deferred	Deferral Amount
2017-2018	\$ 6,291,481	80%	\$ 5,033,185
2016-2017	20,584,931	60%	12,350,958
2015-2016	(13,081,797)	40%	(5,232,719)
2014-2015	(73,305,829)	20%	<u>(14,661,166)</u>
Total			\$ (2,509,742)

- 3. Actuarial value of assets (1 – 2e) \$ 822,926,030

Schedule A - Membership Data

	September 1, 2018 ¹	September 1, 2016 ¹
1. Active members		
a. Number vested	1,902	2,008
b. Number non-vested	<u>2,443</u>	<u>2,209</u>
c. Total	4,345	4,217
d. Covered payroll	\$ 167,225,529	\$ 156,336,028
e. Average annual pay	\$ 38,487	\$ 37,073
f. Average age	45.8	46.5
g. Average service (years)	10.1	10.6
2. Retired members		
a. Number currently being paid from Plan ²	3,174	2,863
b. Total current annual benefit	\$ 59,700,507	\$ 52,488,661
c. Average current annual benefit	\$ 18,809	\$ 18,333
d. Average age	69.8	69.4
3. Deferred vested members		
a. Number entitled to deferred benefits ³	181	141
b. Total deferred annual benefit	\$ 2,624,290	\$ 1,949,199
c. Average deferred annual benefit	\$ 14,499	\$ 13,824
d. Average age	48.4	49.7

¹ Census data provided as of July 1 preceding valuation date is assumed to be the same as of September 1. Compensation amounts have been adjusted for two months at assumed salary increases.

² Excludes retirees for whom annuities were purchased from Prudential, but whose cost-of-living increases are paid by the Plan (198 as of July 1, 2016 and 161 as of July 1, 2018).

³ Excludes terminated members entitled to refunds of contributions paid after July 1 (311 members with \$3,002,034 in contributions as of July 1, 2016 and 504 members with \$4,579,540 in contributions as of July 1, 2018).

Schedule B - Summary of Benefit Provisions

First Tier Plan

Final Wages

The greatest of (i) average of Member's total earnings in the 36 months before retirement, (ii) average of Member's base pay for the year before retirement, or (iii) Member's base pay in the month preceding retirement.

Member

All classified civil service employees of the City of El Paso, except for members of the Policemen's or Firemen's Pension Fund. Permanent part-time employees and certain full-time employees not in the classified civil service are not required to participate but may elect to do so. Special rules apply to certain "grant-funded" employees. The First Tier Plan applies to employees who become plan participants prior to September 1, 2011.

Credited Service

Years and months of service while a Member. At retirement, a Member may convert unused sick leave to service under the plan. An unlimited amount of sick leave may be converted to benefit service. Alternatively, up to six months of sick leave may be applied to meet a benefit eligibility requirement, but if so used, such service cannot also be used in the calculation of the benefit amount.

Contribution Rates

Effective September 1, 2014, active members contribute 8.95% of his/her wages per year. The City contributes 14.05% of the member's wages per year.

Service Retirement Benefits

Normal Retirement Benefit

Eligibility

Age 55 with 10 years of Credited Service, age 60 with 7 years of Credited Service, or 30 years of Credited Service, if earlier.

Benefit

2.50% of Final Wages times years of Credited Service, subject to a minimum benefit of \$75.

Early Retirement Benefit

Eligibility

Age 40 with 10 years of Credited Service, or age 45 with at least 7 years of Credited Service.

Benefit

2.50% of Final Wages times years of Credited Service, multiplied by the appropriate actuarial reduction factor.

Deferred Retirement Benefit

Eligibility

Age 40 with 10 years of Credited Service, or age 45 with at least 7 years of Credited Service.

Benefit

2.50% of Final Wages times years of Credited Service, payable at early retirement age reduced in accordance with the Early Retirement Benefit or unreduced at normal retirement age.

Schedule B - Summary of Benefit Provisions (continued)

Withdrawal (Refund) of Contributions

Eligibility

Immediate.

Benefit

Total employee contributions without interest. If the member has more than five years of service, contributions are paid with interest, credited annually at 5.5%. No other benefits are payable under the Plan once the contributions are withdrawn.

Survivor Benefits

Qualified Surviving Spouse or Child Benefit

Eligibility

Death of a Member due to a job-related accident or age 40 with ten years of service or age 45 with seven years of service.

Benefit

Amount payable if Member had retired immediately prior to death with a Joint and 100% option, subject to a \$75 per month minimum benefit. If death is due to a job-related accident, there is a minimum \$550 per month benefit and the benefit is computed as if the Member were age 70 with 30 years of service. Benefits payable to the surviving spouse continue for life or until remarriage. If Member was not eligible for Early Retirement or death was not due to a job-related accident, a refund of contributions is available to the beneficiary, as described above.

Disability Retirement Benefit

Eligibility

Disability as a result of a job-related cause or any injury not due to the Member's own fault if Member has seven years of service.

Benefit

2.50% of Final Wages times Credited Service, with a minimum benefit of \$75 per month (or \$250 per month if disability is job-related).

Normal Form of Retirement Benefit

Joint and 2/3 survivor annuity. Optional forms of benefit are life only, joint and 100% survivor, joint and 50% survivor, and modified cash refund.

Schedule B - Summary of Benefit Provisions (continued)

Second Tier Plan

Final Wages

The average of Member's total earnings in the 36 months before retirement.

Member

All classified civil service employees of the City of El Paso, except for members of the Policemen's or Firemen's Pension Fund. Permanent part-time employees and certain full-time employees not in the classified civil service are not required to participate but may elect to do so. Special rules apply to certain "grant-funded" employees. The Second Tier Plan applies to employees who become plan participants after August 31, 2011.

Credited Service

Years and months of service while a Member. At retirement, a Member may convert unused sick leave to service under the plan. An unlimited amount of sick leave may be converted to benefit service. Alternatively, up to six months of sick leave may be applied to meet a benefit eligibility requirement, but if so used, such service cannot also be used in the calculation of the benefit amount.

Contribution Rates

Effective September 1, 2014, active members contribute 8.95% of his/her wages per year. The City contributes 14.05% of the member's wages per year.

Service Retirement Benefits

Normal Retirement Benefit

Eligibility

Age 60 with 7 years of Credited Service, or 35 years of Credited Service, if earlier.

Benefit

2.25% of Final Wages times years of Credited Service, subject to a minimum benefit of \$75, limited to 90% of the 3-year final average pay.

Early Retirement Benefit

Eligibility

Age 45 with 7 years of Credited Service.

Benefit

2.25% of Final Wages times years of Credited Service, multiplied by the appropriate actuarial reduction factor.

Deferred Retirement Benefit

Eligibility

Age 45 with 7 years of Credited Service.

Benefit

2.25% of Final Wages times years of Credited Service, payable at early retirement age reduced in accordance with the Early Retirement Benefit or unreduced at normal retirement age.

Schedule B - Summary of Benefit Provisions (continued)

Withdrawal (Refund) of Contributions

Eligibility

Immediate.

Benefit

Total employee contributions without interest. If the member has more than seven years of service, contributions are paid with interest, credited annually at 3.0%. No other benefits are payable under the Plan once the contributions are withdrawn.

Survivor Benefits

Qualified Surviving Spouse or Child Benefit

Eligibility

Death of a Member due to a job-related accident or age 45 with seven years of service.

Benefit

Amount payable if Member had retired immediately prior to death with a Joint and 100% option, subject to a \$75 per month minimum benefit. If death is due to a job-related accident, there is a minimum \$550 per month benefit and the benefit is computed as if the Member were age 70 with 30 years of service. Benefits payable to the surviving spouse continue for life or until remarriage. If Member was not eligible for Early Retirement or death was not due to a job-related accident, a refund of contributions is available to the beneficiary, as described above.

Disability Retirement Benefit

Eligibility

Disability as a result of a job-related cause or any injury not due to the Member's own fault if Member has seven years of service.

Benefit

2.25% of Final Wages times Credited Service, with a minimum benefit of \$75 per month (or \$250 per month if disability is job-related).

Normal Form of Retirement Benefit

Joint and 2/3 survivor annuity. Optional forms of benefit are life only, joint and 100% survivor, joint and 50% survivor, and modified cash refund.

Changes in Plan Provisions Since the Previous Valuation

None.

Schedule C - Statement of Actuarial Methods and Assumptions

Basis for Assumptions

The economic and demographic assumptions used in the valuation were adopted by the Board in consultation with Buck. The Board's established practice is to review the experience of the Plan periodically to determine if any changes to the valuation assumptions are warranted. In general, the assumptions used in the valuation are based on recommendations made and approved by the Board as part of an Experience Study covering plan years from September 1, 2010 through August 31, 2014.

Investment Return

7.50% per annum, net of expenses. This rate reflects an underlying inflation rate of 3.00% and a real rate of return of 4.50%.

Separations Before Normal Retirement

Representative values of the assumed annual rates of withdrawal are as follows:

Age	Withdrawal					
	Years of Credited Service					
	1	2	3	4	5	>=6
25	10.0%	10.0%	9.00%	8.00%	7.00%	9.0%
30	10.0	10.0	9.00	8.00	7.00	10.0
35	10.0	10.0	9.00	8.00	7.00	5.0
40	10.0	10.0	9.00	8.00	7.00	4.0
45	10.0	10.0	9.00	8.00	7.00	2.5
50	10.0	10.0	9.00	8.00	7.00	1.5
55	10.0	10.0	9.00	8.00	7.00	1.5
60	10.0	10.0	9.00	8.00	7.00	1.5

Mortality

Mortality rates for non-disabled participants are based on the RP-2014 employee tables with Blue Collar adjustment projected to 2030 using Scale BB. Mortality rates for disabled participants are based on the RP-2014 Tables for Disabled Lives.

Disability

None assumed.

Death

5% of deaths among active participants are assumed to be job-related deaths. The remaining 95% of deaths are assumed not to be job-related.

Schedule C - Statement of Actuarial Methods and Assumptions (continued)

Salary Increases

The assumed annual rates of future salary increase attributable to longevity and promotion are as follows:

Years of Service	Annual Rate of Salary Increase
0	4.50%
1	4.50
2	4.50
3	4.00
4	4.00
5	4.00
6	4.00
7	3.50
8	3.50
9	3.50
10	3.50
11	3.50
12	3.00
13	3.00
14	3.00
15	3.00
16	3.00
17	3.00
18	3.00
19	3.00
20	3.00
21	3.00
22	3.00
23	3.00
24 or more	3.00

Total payroll is assumed to increase 3.00% per year. This increase rate is solely due to the effect of inflation on salaries, with no allowance for future membership growth.

Overtime is assumed to be 4% of base and longevity pay.

Schedule C - Statement of Actuarial Methods and Assumptions (continued)

Retirement Rates

The percentage of those eligible for normal retirement assumed to retire at various ages is as follows:

Retirement Rates					
Age	Tier 1		Age	Tier 2	
	Male	Female		Male	Female
45	10.0%	9.0%	45	5.0%	5.0%
50	10.0	9.0	50	5.0	5.0
55	12.0	10.0	55	8.0	7.0
62	20.0	10.0	62	10.0	7.0
65	20.0	20.0	65	10.0	12.0
70	40.0	25.0	70	40.0	20.0
75	100.0	100.0	75	100.0	100.0

Spouses

100% of active members are assumed to be married with the male three years older than the female. No children's benefits were valued.

Form of Payment

85% of participants eligible for early retirement are assumed to be paid through a joint and 2/3 survivor annuity. The remaining 15% of participants eligible for early retirement are assumed to elect a refund of contributions.

Future Expenses

None assumed.

Valuation Method

The method used to determine Normal Cost and Accrued Actuarial Liability is the Entry Age Normal Cost Method. Under the Entry Age Normal Cost Method, an annual Normal Cost is determined for each covered active Member which is the contribution required to provide all the projected pension benefits assuming this contribution is payable over a period ending on the date of retirement (separation from active service) and expressed as a level percentage of compensation. The Actuarial Accrued Liability is determined as the excess of the total present value of all pension benefits over the total present value of future Normal Costs. The Unfunded Actuarial Accrued Liability as of the valuation date is determined as the excess of the Actuarial Accrued Liability over the Actuarial Value of Assets of the Plan.

Schedule C - Statement of Actuarial Methods and Assumptions (continued)

Actuarial Value of Assets

The actuarial value of assets is calculated based on the following formula:

$$\begin{aligned} MV & - (8/10) \times G/(L)_1 - (6/10) \times G/(L)_2 \\ & - (4/10) \times G/(L)_3 - (2/10) \times G/(L)_4 \end{aligned}$$

where:

MV = the market value of assets as of the valuation date

$G/(L)_i$ = the asset gain or (loss) (i.e., actual return on assets less expected return on assets) for the i-th year preceding the valuation date.

Changes in Methods and Assumptions Since the Previous Valuation

None.

Schedule D – Glossary of Terms

Actuarial Accrued Liability

The portion, as determined by a particular cost method, of the total present value of benefits that is attributable to past service credit.

Actuarial Assumptions

Estimates of future experience with respect to rates of mortality, disability, turnover, retirement rate or rates of investment income and salary increases. Actuarial assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Gain (Loss) or Liability/Asset Experience

A measure of the difference between actual and expected experience based upon a set of actuarial assumptions.

Actuarial Present Value of Future Benefits

Also referred to as the present value of benefits. It is the value, as of a specified date, of an amount payable in the future, where the amount has been adjusted to reflect both the time value of money and the probability that the payment is actually made.

Actuarial Present Value of Future Normal Costs

The value, as of a specified date, of future normal costs, equal to the employer normal cost rate times the actuarial present value of future pay.

Actuarial Present Value of Future Pay

The value, as of a specified date, of future pay where the amount has been adjusted to reflect both the future value of money and the probability that the payment is actually made.

Amortization Rate or UAAL Payment

That portion of the pension plan contribution which is designed to pay off (amortize) the unfunded actuarial accrued liability in a systematic fashion.

Cost-of-living adjustments

Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.

Covered Payroll

The rate of pay as of a specified date adjusted with a half-year salary increase based on the assumed salary increase assumptions.

Entry Age Actuarial Cost Method

This method assumes that the annual costs are the level premiums needed from entry age until retirement age to fund the ultimate retirement benefit. These premiums are expressed as a percentage of salary. The portion of this actuarial present value allocated to a valuation year is called the normal cost.

Schedule D – Glossary of Terms (continued)

Normal Cost

The ongoing annual cost allocated to the system by a particular actuarial cost method for providing benefits (future cost). Normal cost payments are made during the working lifetime of the member.

Unfunded Actuarial Accrued Liability

The excess of the actuarial accrued liability over the actuarial value of assets.

Vested Benefit

The benefit an employee is entitled to, based on vesting service, even if the employee separates from active service prior to normal retirement age.

Table 1 - The Number and Average Annual Wages of Active Members Distributed by Fifth Age and Service as of September 1, 2018

Attained Age	Years of Credited Service										Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	
Under 25	56 24,314	64 26,965	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	120
25 to 29	101 29,753	257 32,599	34 28,457	0 0	0 0	0 0	0 0	0 0	0 0	0 0	392
30 to 34	61 30,700	253 33,256	136 40,020	19 40,219	0 0	0 0	0 0	0 0	0 0	0 0	469
35 to 39	60 34,609	185 35,377	136 37,473	96 38,945	11 37,985	1 37,624	0 0	0 0	0 0	0 0	489
40 to 44	37 29,570	150 36,575	124 38,648	125 46,591	63 48,171	11 40,431	2 63,222	0 0	0 0	0 0	512
45 to 49	41 30,175	123 36,352	104 38,293	133 40,897	102 45,846	78 42,148	28 40,660	1 48,357	0 0	0 0	610
50 to 54	28 32,598	87 39,658	110 34,400	109 38,367	106 41,153	91 47,403	92 46,126	19 52,665	1 52,154	0 0	643
55 to 59	15 32,284	76 35,178	95 35,725	117 37,658	104 37,977	77 44,054	90 44,546	42 46,492	4 118,978	1 42,901	621
60 to 64	9 40,561	31 36,729	52 37,478	74 38,230	67 40,408	43 43,992	42 54,058	19 46,111	10 80,125	4 75,615	351
65 to 69	4 37,131	10 35,540	14 56,480	26 42,471	20 36,292	13 39,414	13 52,026	7 52,953	1 48,143	5 65,954	113
70 & up	1 36,037	1 36,531	2 88,634	7 35,880	5 33,033	2 47,737	2 37,096	2 34,064	0 0	3 40,290	25
Total	413	1,237	807	706	478	316	269	90	16	13	4,345

Table 2 - The Number and Annual Retirement Allowances of Retired Members, Disabled Members and Beneficiaries by Age as of July 1, 2018

Age	Number	Benefit	Average Benefit
Less than 20	1	\$ 15,829	\$ 15,829
29	1	8,527	8,527
32	1	16,842	16,842
33	1	24,161	24,161
37	1	7,999	7,999
39	1	5,400	5,400
42	1	5,803	5,803
45	3	36,235	12,078
46	2	37,959	18,980
47	2	18,727	9,364
48	7	54,534	7,791
49	4	43,419	10,855
50	3	43,450	14,483
51	12	119,387	9,949
52	15	277,117	18,474
53	17	189,580	11,152
54	16	213,505	13,344
55	26	692,190	26,623
56	57	1,107,009	19,421
57	62	1,500,329	24,199
58	68	1,563,936	22,999
59	87	1,828,612	21,019
60	101	2,556,388	25,311
61	91	1,888,866	20,757
62	105	2,170,926	20,675
63	131	2,776,987	21,198
64	113	2,223,316	19,675
65	151	3,228,606	21,381
66	133	2,808,589	21,117
67	138	2,874,681	20,831
68	130	2,479,173	19,071
69	117	2,026,332	17,319
70	129	2,805,499	21,748
71	122	2,696,898	22,106
72	153	3,102,826	20,280
73	105	1,880,278	17,907
74	81	1,342,140	16,570

Table 2 - The Number and Annual Retirement Allowances of Retired Members, Disabled Members and Beneficiaries by Age as of July 2018 (continued)

Age	Number	Benefit	Average Benefit
75	96	1,511,283	15,743
76	85	1,723,096	20,272
77	67	1,350,326	20,154
78	75	1,252,905	16,705
79	62	946,182	15,261
80	61	900,021	14,754
81	61	913,763	14,980
82	60	773,318	12,889
83	63	1,001,288	15,893
84	55	875,494	15,918
85	38	512,352	13,483
86	56	740,886	13,230
87	33	390,914	11,846
88	30	402,049	13,402
89	33	398,249	12,068
90	34	406,104	11,944
91 & over	<u>77</u>	<u>930,222</u>	<u>12,081</u>
TOTAL	3,174	\$ 59,700,507	\$ 18,809

Table 3 - The Number and Future Annual Allowances of Terminated Members, Entitled to a Future Benefit by Age as of July 1, 2018

Age	Number	Benefit	Average Benefit
Less than 25	1	\$ 960	\$ 960
28	1	960	960
30	1	17,880	17,880
32	3	5,832	1,944
33	3	20,325	6,775
34	1	2,188	2,188
35	4	34,191	8,548
36	1	5,660	5,660
37	1	63,480	63,480
38	3	68,520	22,840
39	5	86,695	17,339
40	6	129,564	21,594
41	2	8,160	4,080
42	5	38,258	7,652
43	3	14,007	4,669
44	7	82,339	11,763
45	6	93,063	15,511
46	8	78,484	9,811
47	6	151,463	25,244
48	10	281,731	28,173
49	7	92,004	13,143
50	5	68,616	13,723
51	9	188,084	20,898
52	9	105,945	11,772
53	11	115,090	10,463
54	15	286,592	19,106
55	15	201,778	13,452
56	8	128,982	16,123
57	3	35,008	11,669
58	7	49,275	7,039
59	3	30,840	10,280
61	5	79,496	15,899
63	2	21,720	10,860
64	1	3,120	3,120
66	1	19,170	19,170
70	1	10,013	10,013
71	<u>1</u>	<u>4,797</u>	<u>4,797</u>
TOTAL	181	\$ 2,624,290	\$ 14,499