THE WOODLANDS
FIREFIGHTERS' RETIREMENT SYSTEM

ACTUARIAL VALUATION
AS OF JANUARY 1, 2019

FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

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April 19, 2019

Mr. Doug Adams, Chairman
The Woodlands Firefighters'
Retirement System
P.O. Box 130388
The Woodlands, TX 77393

Re: The Woodlands Firefighters' Retirement System

Dear Mr. Adams:

We are pleased to present to the Board this report of the annual actuarial valuation of The Woodlands Firefighters' Retirement System. The funding valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and to develop the appropriate preferred funding costs as outlined by the Texas Pension Review Board, as well as to determine the funding period required to amortize any existing Unfunded Actuarial Accrued Liability. Use of the results for other purposes may not be applicable and may produce significantly different results.

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. Due to the limited scope of the valuation, we did not perform an analysis of the potential range of such future measurements.

In conducting the valuation, we have relied on personnel, plan design, financial reports, and asset information supplied by the retirement system 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 undersigned are familiar with the immediate and long-term aspects of pension valuations, and meet 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 Woodlands Township, nor does anyone at Foster & Foster Inc. act as a member of the Board of Trustees of The Woodlands Firefighters' Retirement System. 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 us at 239-433-5500.

Respectfully submitted,

Foster & Foster Inc.

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

By: ______________________ Drew D. Ballard, EA, MAAA

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SUMMARY OF REPORT

The actuarial valuation of the The Woodlands Firefighters' Retirement System, performed as of January 1, 2019, has been completed and the results are presented in this Report. The pension costs, compared with those developed in the January 1, 2018 actuarial valuation, are as follows:

Valuation Date	New Assump/ Benefits 1/1/2019	Old Assump/ Benefits 1/1/2019	1/1/2018
Current Normal Cost Rate % of Covered Annual Payroll [1]	22.11%	22.38%	22.66%
Funding Measurements			
Actuarial Accrued Liability (AAL)	33,562,742	34,782,203	30,398,682
Actuarial Value of Assets (AVA)	32,836,586	32,836,586	32,217,888
Unfunded Actuarial Accrued Liability (UAAL = AAL - AVA)	726,156	1,945,617	(1,819,206)
Funded Ratio (AVA / AAL)	97.8%	94.4%	106.0%
Amortization Period	3.6 years	16.9 years	0.0 years
Contributions			
Expected Township Contribution Rate	12.00%	12.00%	12.00%
Expected Member Contribution Rate	12.00%	12.00%	12.00%
Total Expected Contribution Rate	24.00%	24.00%	24.00%
Funding Costs			
Township 20-Year Funding Cost	10.67%	11.87%	N/A
Township 30-Year Funding Cost [2]	10.58%	11.65%	N/A
Township 40-Year Funding Cost	10.55%	11.56%	N/A

[1] *Includes expected administrative expenses of $100,000 annually.*

[2] *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.*

As shown on the previous page, the Total Normal Cost Rate determined as of January 1, 2019 is 22.11% of payroll. The current member contribution rate is 12.00% of payroll, leaving 10.11% of payroll required from the Township. Since the Township is currently scheduled to make annual contributions of 12.00% of payroll to the System, this means that there is a 1.89% of payroll annual contribution that is attributed to pay off the existing Unfunded Actuarial Accrued Liability (UAAL).

Plan experience was unfavorable overall on the basis of the plan's actuarial assumptions. Sources of unfavorable experience included an investment return of -5.9% which fell short of the 7.00% assumption and unfavorable turnover experience. These losses were offset in part by a gain associated with average individual salary increases lower than the assumed rate.

CHANGES SINCE PRIOR VALUATION

Benefit/Fund Changes

The valuation reflects the implementation of the Deferred Retirement Option Plan (DROP) provision. Please refer to the ‘Summary of Benefit Provisions’ section for additional detail.

Actuarial Assumption/Method Changes

The valuation reflects the following assumption change:

- The mortality rates were updated to reflect the PubS-2010 (Above-median, amount-weighted) tables. Given the recent release of a report by the Society of Actuaries on public pension mortality, we feel that these tables are the most representative of the population in question.

There were no method changes since the prior valuation.

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	New Assump/ Benefits 1/1/2019	Old Assump/ Benefits 1/1/2019	1/1/2018
A. Participant Data			
Actives	138	138	140
Service Retirees	1	1	0
Beneficiaries	1	1	0
Disability Retirees	0	0	0
Terminated Vested	6	6	1
Total	146	146	141
Total Annual Payroll	11,936,747	11,936,747	11,904,079
Annual Rate of Payments to:			
Service Retirees	52,441	52,441	0
Beneficiaries	22,459	22,459	0
Disability Retirees	0	0	0
Terminated Vested	63,297	63,297	0
B. Assets			
Actuarial Value (AVA)	32,836,586	32,836,586	32,217,888
Market Value (MVA)	32,836,586	32,836,586	32,217,888
C. Liabilities			
Present Value of Benefits			
Actives			
Retirement + Termination Benefits	57,549,997	57,989,487	56,646,656
Death Benefits	623,428	1,020,300	1,052,504
Disability Benefits	3,778,678	2,890,999	2,923,967
Service Retirees	674,492	658,782	0
Beneficiaries	311,084	312,616	0
Disability Retirees	0	0	0
Terminated Vested	1,310,459	1,294,247	28,170
Total	64,248,138	64,166,431	60,651,297

COMPARATIVE SUMMARY OF PRINCIPAL VALUATION RESULTS

	New Assump/ Benefits 1/1/2019	Old Assump/ Benefits 1/1/2019	1/1/2018
C. Liabilities - (Continued)			
Present Value of Future Salaries	145,067,483	140,145,569	142,910,036
Normal Cost (Entry Age Normal)			
Retirement + Termination Benefits	2,205,307	2,257,779	2,278,745
Death Benefits	38,514	60,359	62,213
Disability Benefits	206,363	162,656	165,652
Total Normal Cost	2,450,184	2,480,794	2,506,610
Present Value of Future Normal Costs	30,685,396	29,384,228	30,252,615
Actuarial Accrued Liability			
Retirement + Termination Benefits	29,862,543	31,208,310	29,071,968
Death Benefits	149,542	311,571	316,952
Disability Benefits	1,254,622	996,677	981,592
Inactives	2,296,035	2,265,645	28,170
Total Actuarial Accrued Liability (AAL)	33,562,742	34,782,203	30,398,682
Unfunded Actuarial Accrued Liability (UAAL)	726,156	1,945,617	(1,819,206)
Funded Ratio (AVA / AAL)	97.8%	94.4%	106.0%
D. Actuarial Present Value of Accrued Benefits			
Inactives	2,296,035	2,265,645	28,170
Actives	30,481,828	21,612,325	24,101,119
Total Present Value Accrued Benefits (PVAB)	32,777,863	23,877,970	24,129,289
Funded Ratio (MVA / PVAB)	100.2%	137.5%	133.5%

GAIN/LOSS ANALYSIS

a. Total (Gain)/Loss

1. Unfunded Actuarial Accrued Liability as of January 1, 2018	($1,819,206)
2. Normal Cost applicable for 2018	2,506,610
3. Expected Administrative Expenses applicable for 2018	100,000
4. Interest on (1), (2), and (3)	51,618
5. Contributions made during 2018	2,755,910
6. Interest on (5)	96,457
7. Expected UAAL as of January 1, 2019: (1)+(2)+(3)+(4)-(5)-(6)	(2,013,345)
8. Actual UAAL as of January 1, 2019 (Before Changes)	1,945,617
Total Actuarial (Gain)/Loss	3,958,962

b. (Gain)/Loss on Assets

1. Market Value of Assets as of January 1, 2018	32,217,888
2. Contributions Less Benefit Payments and Administrative Expenses	2,592,000
3. Expected Investment Earnings	2,345,181
4. Expected AVA as of January 1, 2019: (1)+(2)+(3)	37,155,068
5. Actual Market Value of Assets as of January 1, 2019	32,836,586
(Gain)/Loss on Assets	4,318,483

c. (Gain)/Loss on Liabilities

1. Expected Actuarial Accrued Liability: a(7)+b(4)	35,141,723
2. Actual Actuarial Accrued Liability (Before Changes)	34,782,203
(Gain)/Loss on Liabilities	(359,520)

HISTORY OF GAIN/LOSS

Valuation as of January 1,	Actuarial (Gain)/Loss	(Gain)/Loss on Assets	(Gain)/Loss on Liabilities
2019	3,958,962	4,318,483	(359,520)
2018	(2,110,203)	(1,504,497)	(605,706)
2017	638,330	90,799	547,531
2016	N/A	N/A	N/A

STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2018

ASSETS	COST VALUE	MARKET VALUE
Cash and Cash Equivalents:		
Short Term Investments	36,960.06	36,960.06
Checking Account	5,255.42	5,255.42
Money Market	514,105.82	514,105.82
Cash	87,471.05	87,471.05
Total Cash and Equivalents	643,792.35	643,792.35
Receivables:		
Investment Income	52,707.01	52,707.01
Total Receivable	52,707.01	52,707.01
Investments:		
U. S. Bonds and Bills	450,611.12	450,776.00
Corporate Bonds	2,296,792.45	2,278,924.00
Municipal Bonds	5,167,756.59	5,120,599.55
Stocks	18,060,123.06	18,871,632.94
Mutual Funds:		
Equity	36,543.24	36,998.50
Pooled/Common/Commingled Funds:		
Equity	4,131,656.50	4,562,111.82
Real Estate	864,259.29	819,293.68
Total Investments	31,007,742.25	32,140,336.49
Total Assets	31,704,241.61	32,836,835.85
LIABILITIES		
Payables:		
Administrative Expenses	250.00	250.00
Total Liabilities	250.00	250.00
NET POSITION RESTRICTED FOR PENSIONS	31,703,991.61	32,836,585.85

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
FOR THE YEAR ENDED DECEMBER 31, 2018
Market Value Basis

ADDITIONS			
Contributions:			
Member		1,377,954.86	
Township		1,377,954.86	
Total Contributions			2,755,909.72
Investment Income:			
Net Realized Gain (Loss)	743,063.88		
Unrealized Gain (Loss)	(3,350,742.73)		
Net Increase in Fair Value of Investments		(2,607,678.85)	
Interest & Dividends		772,651.08	
Less Investment Expense[1]		(138,274.20)	
Net Investment Income			(1,973,301.97)
Total Additions			782,607.75
DEDUCTIONS			
Distributions to Members:			
Benefit Payments		45,489.44	
Refunds of Member Contributions		18,922.49	
Total Distributions			64,411.93
Administrative Expense			99,498.27
Total Deductions			163,910.20
Net Increase in Net Position			618,697.55
NET POSITION RESTRICTED FOR PENSIONS			
Beginning of the Year			32,217,888.30
End of the Year			32,836,585.85
Actuarial Asset Rate of Return			-5.9%
Actuarial Gain/(Loss) due to Investment Return			(4,318,482.58)

[1]Investment related expenses include investment advisory, custodial and performance monitoring fees.

STATISTICAL DATA

	1/1/2016	1/1/2017	1/1/2018	1/1/2019
Actives				
Number	136	136	140	138
Average Current Age	38.7	39.7	40.4	40.7
Average Age at Employment	27.7	27.7	27.8	27.6
Average Past Service	11.0	12.0	12.6	13.1
Average Annual Salary	$78,128	$83,706	$85,029	$86,498
Service Retirees				
Number	0	0	0	1
Average Current Age	N/A	N/A	N/A	57.5
Average Annual Benefit	N/A	N/A	N/A	$52,441
Beneficiaries				
Number	0	0	0	1
Average Current Age	N/A	N/A	N/A	37.8
Average Annual Benefit	N/A	N/A	N/A	$22,459
Disability Retirees				
Number	0	0	0	0
Average Current Age	N/A	N/A	N/A	N/A
Average Annual Benefit	N/A	N/A	N/A	N/A
Terminated Vested				
Number	1	1	1	6
Average Current Age [1]	N/A	N/A	N/A	51.0
Average Annual Benefit [1]	N/A	N/A	N/A	$63,297

[1] Excludes non-vested members awaiting a refund of contributions.

AGE AND SERVICE DISTRIBUTION

ATTAINED AGE	PAST SERVICE 0-4	5-9	10-14	15-19	20	21	22	23	24	25-29	30+	TOTAL
15 - 24	0	0	0	0	0	0	0	0	0	0	0	0
25 - 34	25	6	2	0	0	0	0	0	0	0	0	33
35 - 44	12	11	21	14	1	0	1	0	0	0	0	60
45 - 49	1	5	4	12	0	2	1	2	0	0	0	27
50	0	0	0	3	0	0	0	0	0	0	0	3
51	0	0	0	2	0	1	0	0	0	0	0	3
52	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	1	0	0	0	0	0	0	0	1
54	0	0	0	1	0	0	0	0	0	0	0	1
55 - 59	0	0	1	5	1	0	0	0	0	1	0	8
60+	0	0	0	0	0	1	1	0	0	0	0	2
TOTAL	38	22	28	38	2	4	3	2	0	1	0	138

Illustrates members who have attained Normal Retirement eligibility.

VALUATION PARTICIPANT RECONCILIATION

1. Active lives

a. Number in prior valuation 1/1/2018	140
b. Terminations	
i. Vested (partial or full) with deferred benefits	(4)
ii. Non-vested or full lump sum distribution received	(1)
c. Deaths	
i. Beneficiary receiving benefits	(1)
ii. No future benefits payable	0
d. Disabled	0
e. Retired	(1)
f. Continuing participants	133
g. New entrants	5
h. Total active life participants in valuation	138

2. Non-Active lives (including beneficiaries receiving benefits)

	Service Retirees Receiving Benefits	Receiving Death Benefits	Receiving Disability Benefits	Vested Deferred	Total
a. Number prior valuation	0	0	0	1	1
Retired	1	0	0	0	1
Vested Deferred	0	0	0	4	4
Death, With Survivor	0	1	0	0	1
Death, No Survivor	0	0	0	0	0
Disabled	0	0	0	0	0
Refund of Contributions	0	0	0	0	0
Rehires	0	0	0	0	0
Expired Annuities	0	0	0	0	0
Data Corrections	0	0	0	0	0
Hired/Termed in Same Year	0	0	0	1	1
b. Number current valuation	1	1	0	6	8

ACTUARIAL ASSUMPTIONS AND METHODS

Mortality

Active Lives: PubS-2010 (Above-median, amount-weighted) employee rates with mortality improvement projected five years past the valuation date using Scale MP-2018.

Retiree and Vested Terminated Lives: PubS-2010 (Above-median, amount-weighted) healthy retiree rates with mortality improvement projected five years past the valuation date using Scale MP-2018.

Contingent Survivor Lives: PubS-2010 (Above-median, amount-weighted) contingent survivor rates with mortality improvement projected five years past the valuation date using Scale MP-2018.

Disabled Lives: PubS-2010 (amount-weighted) disabled retiree rates with mortality improvement projected five years past the valuation date using Scale MP-2018.

We feel the above rates are reasonable based on the covered classification of employees in the plan. We feel that the projection of mortality rates five years beyond the valuation date is sufficient.

Interest

7.00% annually, net of investment related expenses. This is supported by the target asset allocation of the trust and the expected long-term return by asset class.

Termination

Age-based. Sample rates shown below.

Age	Probability
20	9.8%
30	2.8%
40	0.4%
50	0.2%

We feel the assumed rates of termination are reasonable based on long-term expectations.

Disability

Age-based. Sample rates shown below.

Age	Probability
20	0.07%
30	0.09%
40	0.15%
50	0.50%

We feel the assumed rates of disablement are reasonable based on long-term expectations.

Retirement (2019)

Calendar Year	Probability
2019	50%

Retirement (2020 and beyond)

Age	Probability
52	35%
53	20%
54	20%
55	20%
56	25%
57	25%
58	30%
59	30%
60	50%
61	50%
62	100%

We feel the assumed rates of retirement are reasonable based on long-term expectations.

DROP

Two-thirds (2/3) of Members who are eligible for Normal Retirement are assumed to enter DROP, with an assumed DROP Period of four years.

Salary Increases

Service *	Increase
0-5	11.5%
6-10	6.3%
11-15	5.0%
16+	4.0%

* Based on actual date of hire. We feel the assumed rates of salary increase are reasonable based on long-term expectations.

Payroll Growth

None (for purposes of amortizing the UAAL)

Cost-of-Living Adjustment

None

Administrative Expenses

$100,000 annually, as previously approved by the Board of Trustees.

Marital Status

75% of active participants are assumed to be married. Males are assumed to be three years older than females.

Actuarial Cost Method

Individual Entry Age Normal, Level % of Pay. Benefits are funded until assumed retirement age or DROP exit age.

Actuarial Asset Method

Fair Market Value.

SUMMARY OF BENEFIT PROVISIONS

Credited Service	Total years and months of years during which a Member makes contributions to the System, including years of prior service purchased.
Earnings	Base pay, including standard overtime pay.
Average Final Compensation	Average Earnings for the highest consecutive 36 months over the last 120 months of service.
Member Contributions	12.00% of Earnings.
Township Contributions	12.00% of annual payroll.
Normal Retirement	
Date	Attainment of age 52 and 20 years of Credited Service.
Benefit Accrual Rate	2.50% of Average Final Compensation times Credited Service for first 20 years, plus 3.00% of Average Final Compensation times Credited Service thereafter.
Normal Form of Benefit	10-Year Certain and Life Annuity.
Vesting	
Schedule	Members are eligible to receive a Normal Retirement benefit if 20 or more years of Credited Service has been attained.
Benefit	Normal Retirement benefit payable at age 52.
Refund of Contributions	Non-vested Members are always entitled to a refund of their accumulated contributions (without interest).
Disability	
Eligibility	Total and permanent as determined by the Board.
Benefit	2.50% of Average Final Compensation times Credited Service, but not less than 50% of Average Final Compensation.
Form of Benefit	10-Year Certain and Life Annuity.

Pre-Retirement Death

Eligibility	Covered from the Member's participation date.
Benefit	75% of the Member's accrued benefit at date of death (utilizing at least 20 years of service).
Form of Benefit	Married: 10-Year Certain and Life Annuity to Surviving Spouse. Single: 10-Year Certain Only Annuity.

DROP

Eligibility	Attainment of age 52 and 20 years of Credited Service.
DROP Period	Not to exceed 60 months and must be in whole year increments.
Highest Average Monthly Pay	Average Earnings for the highest consecutive 60 months over the last 120 months of service.
Accumulation	Each Member who elects to participate in DROP has his monthly annuity benefit calculated as of the date of election. Such monthly benefit will be deferred and will commence at the time of the firefighter's actual retirement from the department. Depending on the Member's election, during the DROP Period, certain amounts will be credited each month to a bookkeeping account under the Member's name (the "DROP Account") in accordance with Option #1 or Option #2 below. *Option #1:* During the DROP Period, a Member's monthly annuity benefit amount will be credited each month to the DROP Account. The Member must continue to make the required contributions to the System during the DROP Period, but such contributions will not be credited to the Member's DROP Account. *Option #2:* During the DROP Period, a Member's monthly annuity benefit amount and the Member's contributions will be credited each month to the DROP Account. The monthly annuity benefit amount shall be reduced by five percent (5%) under this option. The reduction to the monthly annuity benefit amount still applies following the DROP Period.

DISCUSSION OF RISK

ASOP No. 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions, states that the actuary should identify risks that, in the actuary's professional judgment, may reasonably be anticipated to significantly affect the plan's future financial condition.

Throughout this report, actuarial results are determined under various assumption scenarios. These results are based on the premise that all future plan experience will align with the plan's actuarial assumptions; however, there is no guarantee that actual plan experience will align with the plan's assumptions.

Below are examples of ways in which plan experience can deviate from assumptions and the potential impact of that deviation. Typically, this results in an actuarial gain or loss representing the current-year financial impact on the plan's unfunded liability of the experience differing from assumptions; this gain or loss impacts the plan's amortization period. When assumptions are selected that adequately reflect plan experience, gains and losses typically offset one another in the long term, resulting in a relatively low impact on the plan's amortization period. When assumptions are too optimistic, losses can accumulate over time and the plan's amortization period could potentially grow to an unmanageable level.

- <u>Investment Return</u>: When the rate of return on the Actuarial Value of Assets falls short of the assumption, this produces a loss representing assumed investment earnings that were not realized. Further, it is unlikely that the plan will experience a scenario that matches the assumed return in each year as capital markets can be volatile from year to year. Therefore, amortization periods can vary in the future.

- <u>Salary Increases</u>: When a plan participant experiences a salary increase that was greater than assumed, this produces a loss representing the cost of an increase in anticipated plan benefits for the participant as compared to the previous year. The total gain or loss associated with salary increases for the plan is the sum of salary gains and losses for all active participants.

- Payroll Growth: The plan's payroll growth assumption, if one is used, causes a predictable annual increase in the plan's amortization payment in order to produce an amortization payment that remains constant as a percentage of payroll if all assumptions are realized. If payroll does not increase according to the plan's payroll growth assumption, the plan's amortization period can increase significantly even if all assumptions other than the payroll growth assumption are realized since anticipated contributions rely upon membership payroll.

- Demographic Assumptions: Actuarial results take into account various potential events that could happen to a plan participant, such as retirement, termination, disability, and death. Each of these potential events is assigned a liability based on the likelihood of the event and the financial consequence of the event for the plan. Accordingly, actuarial liabilities reflect a blend of financial consequences associated with various possible outcomes (such as retirement at one of various possible ages). Once the outcome is known (e.g. the participant retires) the liability is adjusted to reflect the known outcome. This adjustment produces a gain or loss depending on whether the outcome was more or less favorable than other outcomes that could have occurred.

- Amortization Period: Risks associated with the items outlined above will inherently create varying liabilities and assets resulting in volatility in the amortization period. Actuarial losses on assets and liabilities will lead to longer amortization periods, while actuarial gains on assets and liabilities will lead to shorter amortization periods. It is also important to point out that based on the annual scheduled contribution rate exceeding the current normal cost rate by a slim margin, the amortization period in future valuations may be volatile due to the enhanced sensitivity resulting from possible actuarial gains or losses.

It is important to note that the actuary has identified the risks above as the most significant risks based on the characteristics of the plan and the nature of the project, however, it is not an exhaustive list of potential risks that could be considered. Additional advanced modelling, as well as the identification of additional risks, can be provided at the request of the reader.

VALUATION NOTES

Covered Payroll is the projected annual rate of pay for the year beginning on the valuation date for all covered Members.

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.

Entry Age Normal Cost Method - Under this method, the normal cost is the sum of the individual normal costs for all active participants. For an active participant, the normal cost is the participant's normal cost accrual rate, multiplied by the participant's current compensation.

(a) The normal cost accrual rate equals

(i) the present value of future benefits for the participant, determined as of the participant's entry age, divided by

(ii) the present value of the compensation expected to be paid to the participant for each year of the participant's anticipated future service, determined as of the participant's entry age .

(b) In calculating the present value of future compensation, the salary scale is applied both retrospectively and prospectively to estimate compensation in years prior to and subsequent to the valuation year based on the compensation used for the valuation.

(c) The accrued liability is the sum of the individual accrued liabilities for all participants and beneficiaries. A participant's accrued liability equals the present value, at the participant's attained age, of future benefits less the present value at the participant's attained age of the individual normal costs payable in the future. A beneficiary's accrued liability equals the present value, at the beneficiary's attained age, of future benefits. The unfunded accrued liability equals the total accrued liability less the actuarial value of assets.

(d) Under this method, the entry age used for each active participant is the participant's age at the time he or she would have commenced participation if the plan had always been in existence under current terms, or the age as of which he or she first earns service credits for purposes of benefit accrual under the current terms of the plan.

Unfunded Actuarial Accrued Liability (UAAL) is the difference between the actuarial accrued liability (described above) and the actuarial value of assets. Under the Entry Age Normal Actuarial Cost Method, an actuarial gain or loss, based on actual versus expected UAAL, is determined in conjunction with each valuation of the plan.