



Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve



**Report of the Actuary on the Annual Valuation
of the Charlotte Firefighters' Retirement System**

Prepared as of July 1, 2019





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

October 28, 2019

Board of Trustees
Charlotte Firefighters' Retirement System
428 East Fourth Street
Suite 205
Charlotte, NC 28202

Dear Members of the Board:

We are pleased to submit herewith the results of the annual actuarial valuation of the City of Charlotte Firefighters' Retirement System prepared as of July 1, 2019. The purpose of this report is to provide a summary of the funded status of the System as of July 1, 2019 and to recommend rates of contribution. In performing the valuation, we relied on data provided by the System. While not verifying the data at source, the actuary performed tests for consistency and reasonability.

The asset values used to determine unfunded liabilities are not market values but less volatile market related values. A smoothing technique is applied to market values to determine the market related values. The unfunded liability amounts using the market value of assets would be different. The interest rate used for determining liabilities is based on the expected return on assets. Therefore, liability amounts in the report cannot be used to assess a settlement of the obligation.

The promised benefits of the System are included in the actuarially calculated contribution rates which are developed using the entry age cost method. A five-year smoothed market value of plan assets was used for the actuarial value of assets. Consistent with the Board's funding policy, gains and losses are reflected in the unfunded accrued liability that is being amortized by regular annual contributions as a level percentage of payroll within a 30-year period, on the assumption that payroll will increase by 3.00% annually. The actuarially determined employer contribution rate is 21.04% of payroll for the fiscal year ending June 30, 2021.

The valuation reflects the increases in benefits due to the Kurzel lawsuit, as well as the change in the City's leave accrual policy.

Separate reports will be issued to provide the disclosure information required under GASB Statements No. 67 and 68.

We have prepared the Schedule of Active Member Valuation Data, Schedule of Retired Members and Beneficiaries Added to and Removed from Rolls, the Solvency Test and the Analysis of Financial Experience for the actuarial section of the Annual Report and the Schedule of Funding Progress and Trend Information for the financial section of the Annual Report.



This is to certify that the independent consulting actuary is a Member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the System and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

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

We trust that the report will meet the approval of the Board and will furnish the desired information concerning the financial condition of the System.

Respectfully submitted,

A handwritten signature in blue ink that reads 'Todd B. Green' followed by a horizontal line.

Todd B. Green, ASA, FCA, MAAA
Principal and Consulting Actuary

A handwritten signature in blue ink that reads 'Cathy Turcot'.

Cathy Turcot
Principal and Managing Director



TABLE OF CONTENTS

<u>Section</u>	<u>Item</u>	<u>Page No.</u>
I	Summary of Principal Results	1
II	Membership Data	2
III	Assets	3
IV	Comments on Valuation	3
V	Contributions Payable	4
VI	Accounting Information	6
VII	Experience	8
VIII	Risk	9
<u>Schedule</u>		
A	Development of the Unfunded Actuarial Accrued Liability	10
B	Valuation Balance Sheet and Solvency Test	11
C	Development of the Actuarial Value of Assets	13
D	Asset Information	14
E	Outline of Actuarial Assumptions and Methods	15
F	Actuarial Cost Method	17
G	Summary of Main System Provisions as Interpreted for Valuation Purposes	18
H	Tables of Membership Data	20



**CHARLOTTE FIREFIGHTERS' RETIREMENT SYSTEM
REPORT OF THE ACTUARY
ON THE ANNUAL VALUATION
PREPARED AS OF JULY 1, 2019**

SECTION I – SUMMARY OF PRINCIPAL RESULTS

1. For convenience of reference, the principal results of the current and preceding valuations are summarized below.

Valuation Date	July 1, 2019	July 1, 2018
Active members:		
Number	1,047	1,058
Annualized compensation	\$77,040,854	\$71,781,041
Retired members and beneficiaries:		
Number	750	697
Annual allowances	\$37,719,709	\$33,569,732
Number of terminated vested members*	15	16
Assets:		
Market Value	\$558,868,579	\$551,892,495
Actuarial Value	566,041,931	548,684,512
Unfunded actuarial accrued liability	\$118,345,234	\$77,833,564
Funded Ratio	82.7%	87.6%
Amortization Period (ADEC)	30 years	30 years
Amortization Period (Statutory)	N/A	N/A
Fiscal Year Ending	June 30, 2021	June 30, 2020
City actuarially determined employer contribution rate (ADEC):		
Normal (including expenses of 0.75%)	11.41%	11.01%
Accrued liability	<u>9.63</u>	<u>6.80</u>
Total	21.04%	17.81%
Employer Statutory contribution rate	12.65%	12.65%
Member contribution rate	12.65%	12.65%



2. The major benefit and contribution provisions of the System as reflected in the valuation are summarized in Schedule G. The valuation reflects the increases in benefits due to the Kurzel lawsuit, as well as the change in the City's leave accrual policy.
3. Schedule E of this report outlines the full set of actuarial assumptions and methods used in the valuation. There have been no changes since the previous valuation.
4. The entry age actuarial cost method was used to prepare the valuation. Schedule F contains a brief description of the actuarial cost method.
5. Comments on the valuation results as of July 1, 2019 are given in Section IV and further discussion of the contributions is set out in Section V.

SECTION II – MEMBERSHIP DATA

1. Data regarding the membership of the System for use as a basis of the valuation were furnished by the City. The valuation included 1,047 active members with annualized compensation totaling \$77,040,854.
2. The following table shows the number of retired members and beneficiaries as of July 1, 2019 together with the amount of their annual retirement benefits payable under the System as of that date.

**THE NUMBER AND ANNUAL BENEFITS OF
RETIRED MEMBERS AND BENEFICIARIES
AS OF JULY 1, 2019**

GROUP	NUMBER*	ANNUAL RETIREMENT BENEFITS
Service Retirements	663	\$35,745,241
Disability Retirements	39	1,042,996
Beneficiaries of Deceased Members	<u>48</u>	<u>931,472</u>
Total	750	<u>\$37,719,709</u>

*In addition, there are 15 terminated members entitled to deferred vested benefits.



3. Table 1 of Schedule H shows the distribution by age and years of membership service of the number of active members included in the valuation, while Table 2 shows the number and annual benefits of retired members and beneficiaries included in the valuation, distributed by age. Table 3 shows the schedule of active member valuation data and Table 4 shows the schedule of retired members and beneficiaries added to and removed from the rolls.

SECTION III – ASSETS

As of July 1, 2019, the total market value of assets amounted to \$558,868,579. The actuarial value of assets used for the current valuation was \$566,041,931. Schedule C shows the development of the actuarial value of assets as of July 1, 2019. Schedule D shows the allocation of the System's assets and the market value of assets for three years.

SECTION IV – COMMENTS ON VALUATION

1. Schedule B of this report contains the valuation balance sheet which shows the present and prospective assets and liabilities of the System as of July 1, 2019. The valuation was prepared in accordance with the actuarial assumptions set forth in Schedule E and the actuarial cost method which is described in Schedule F.
2. The valuation balance sheet shows that the System has total prospective liabilities of \$877,974,375 of which \$384,295,517 is for the prospective benefits payable on account of present retired members, beneficiaries of deceased members, and terminated members entitled to deferred benefits, and \$493,678,858 is for the prospective benefits payable on account of present active members. Against these liabilities, the System has a total present actuarial value of assets of \$566,041,931 as of July 1, 2019. The difference of \$311,932,444 between the total liabilities and the total present assets represents the present value of future contributions.
3. The contributions to the System consist of normal contributions and accrued liability contributions. The valuation indicates that normal contributions at the rate of 23.31% of payroll are required under the entry age method. Of this amount, 12.65% is paid by the members and the remaining 10.66% is required by the City.



4. Prospective normal contributions at the rate of 23.31% have a present value of \$193,587,210. When this amount is subtracted from \$311,932,444, which is the present value of the total future contributions to be made, there remains \$118,345,234 as the amount of unfunded accrued liability contributions. The development of the unfunded accrued liability is shown in Schedule A.

SECTION V – CONTRIBUTIONS PAYABLE

1. The contributions consist of a normal contribution and an accrued liability contribution as determined by actuarial valuation.
2. The normal contribution rate is calculated as the level percentage of payroll which, if applied for the average member during the entire period of his anticipated covered service, would be required to meet the cost of all benefits payable on his behalf. On the basis of the valuation, the normal contribution rate was determined to be 23.31%.
3. Section 24 of Title V of the Charlotte Firefighters' Retirement System Act states that each member shall contribute an amount equal to the Member's Compensation multiplied by 12.65%.
4. The City normal contribution rate is equal to the difference between the normal contribution rate of 23.31% and the member contribution rate of 12.65%, or 10.66% of payroll. An additional 0.75% is required for expenses, making the total City normal rate 11.41% of payroll.
5. Section 25 of Title V of the Charlotte Firefighters' Retirement System Act states that the City of Charlotte shall contribute an amount equal to the Member's Compensation multiplied by 12.65%. These contributions are not sufficient to fund the system in an actuarially sound manner. The actuarially determined employer contribution (ADEC) rate beginning July 1, 2020 is 21.04% of payroll.
6. Consistent with the Board's funding policy, based on a total employer rate of 21.04%, the annual accrued liability contribution rate is determined to be 9.63% of payroll. This rate will be sufficient to amortize the unfunded actuarial accrued liability of \$118,345,234 within 30 years following the valuation date, on the assumption that the payroll will increase 3.00% each year. For the ten year period ended July 1, 2019, payroll has grown by 3.08%.



7. The following table summarizes the employer contributions which were determined by the July 1, 2019 valuation and are recommended for use.

**CITY ACTUARIALLY DETERMINED EMPLOYER CONTRIBUTIONS (ADEC)
FOR FISCAL YEAR ENDING JUNE 30, 2021**

CONTRIBUTION	PERCENTAGE OF ACTIVE MEMBERS' COMPENSATION
Normal (including expenses of 0.75%)	11.41%
Accrued Liability	<u>9.63</u>
Total	<u>21.04%</u>



SECTION VI – ACCOUNTING INFORMATION

The information required under the Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 for the Plan and the City will be issued in separate reports. We are providing the following information for the informational purposes only.

- The following is a distribution of the number of employees by type of membership:

**NUMBER OF ACTIVE AND RETIRED PARTICIPANTS
AS OF JULY 1, 2019**

GROUP	NUMBER*
Retired participants and beneficiaries currently receiving benefits	750
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	15
Active Participants	<u>1,047</u>
Total	1,812

- The schedule of funding progress is shown below.

SCHEDULE OF FUNDING PROGRESS
(dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) Entry Age (b)	Unfunded AAL (UAAL) (b – a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b – a) / c)
7/01/2014	\$425,166	\$478,213	\$53,048	88.9%	\$64,190	82.6%
7/01/2015	467,545	504,486	36,941	92.7	65,821	56.1
7/01/2016 ¹	490,864	564,546	73,682	86.9	66,797	110.3
7/01/2017	520,579	604,169	83,590	86.2	70,610	118.4
7/01/2018	548,685	626,518	77,834	87.6	71,781	108.4
7/01/2019	566,042	684,387	118,345	82.7	77,041	153.6

¹Economic and demographic assumptions were changed as of July 1, 2016 due to an experience review.



3. Additional information as of July 1, 2019 follows:

Valuation date	7/01/2019
Actuarial cost method	Entry age
Amortization period	Level Percent of Pay, Open
Remaining amortization period	30 years
Asset valuation method	Five-year smoothed market value
Actuarial assumptions:	
Investment rate of return (includes inflation)	7.50%
Projected salary increases (includes inflation)	3.75 – 9.00%
Inflation	3.00%
Cost-of-living adjustments	None



SECTION VII – EXPERIENCE

1. As an aid to the Board in adopting service and mortality tables, the actuary prepared an experience investigation for the five-year period ending June 30, 2014. The valuation was based on the assumptions adopted by the Board at the January 21, 2016 Board meeting as a result of that investigation.
2. The following tables show the estimated change in the unfunded accrued liability from various factors that resulted in an increase of \$40,511,670 in the unfunded accrued liability from \$77,833,564 to \$118,345,234 during the fiscal year ending June 30, 2019.

ANALYSIS OF FINANCIAL EXPERIENCE – RECONCILIATION OF UNFUNDED ACCRUED LIABILITY

1. Unfunded Accrued Liability June 30, 2018	\$77,833,564
2. Normal Cost (including Expenses)	16,190,785
3. Actual Contributions	20,803,000
4. Interest [(1 + 2) x 7.50% - (3 x 7.50% x 0.5)]	<u>6,271,714</u>
5. Expected Unfunded Accrued Liability June 30, 2019 [1 + 2 - 3 + 4]	\$79,493,063
6. Actual Unfunded Accrued Liability June 30, 2019	\$118,345,234
7. (Gain)/Loss [6 - 5]	\$38,852,171

ANALYSIS OF FINANCIAL EXPERIENCE – (GAINS)/LOSSES BY SOURCE

Recognized Asset (Gain)/Loss	\$7,292,481
Liability (Gain)/Loss	8,049,356
Salary Increases	15,335,173
Amendments (COLA)*	8,175,161
Assumption and Method Changes	<u>0</u>
Total (Gain)/Loss	\$38,852,171

*Includes the impact of benefit increases due to the Kurzel lawsuit and the impact of the revised sick leave policy.



SECTION VIII – RISK

1. Measuring pension obligations and actuarially determined contributions requires the use of assumptions regarding future economic and demographic experience. Whenever assumptions are made about future events, there is risk that actual experience will differ from expected. Actuarial valuations include the risk that actual future measurements will deviate from expected future measurements due to actual experience that is different than the actuarial assumptions.
2. The primary areas of risk in this actuarial valuation are:
 - Investment Risk – the potential that investment returns will be different than expected.
 - Longevity and Other Demographic Risks – the potential that mortality or other demographic experience will be different than expected.
 - Interest Rate Risk – To the extent market rates of interest affect the expected return on assets, there is a risk of change to the discount rate which determines the present value of liabilities and actuarial valuation results.
 - Contribution Risk – The potential that actual contributions are different than the actuarially determined contributions.
3. Annual actuarial valuations are performed for CFRS which re-measure the assets and liabilities and compute a new actuarially determined contribution. CFRS also has experience studies performed every five years to analyze the discrepancies between actuarial assumptions and actual experience and determine if the actuarial assumptions need to be changed. Annual actuarial valuations and periodic experience studies are practical ways to monitor and reassess risk.



SCHEDULE A

**DEVELOPMENT OF THE UNFUNDED ACTUARIAL ACCRUED LIABILITY
AS OF JULY 1, 2019**

(1)	Present value of prospective benefits:	
(a)	Present active members	\$493,678,858
(b)	Present retired members, beneficiaries and former members entitled to deferred vested benefits	<u>384,295,517</u>
(c)	Subtotal	877,974,375
(2)	Present value of future System and member normal contributions before expenses	<u>193,587,210</u>
(3)	Actuarial accrued liabilities 1(c) – (2)	684,387,165
(4)	Actuarial value of assets	<u>566,041,931</u>
(5)	Unfunded actuarial accrued liability (3) – (4)	\$ 118,345,234



SCHEDULE B

VALUATION BALANCE SHEET

The present and prospective assets and liabilities of the System as of July 1, 2019:

<u>ACTUARIAL LIABILITIES</u>		
Present value of prospective benefits payable on account of present retired members, beneficiaries of deceased members, and terminated members entitled to deferred benefits		\$384,295,517
Present value of prospective benefits payable on account of present active members		<u>493,678,858</u>
Total liabilities		<u>\$877,974,375</u>
<u>PRESENT AND PROSPECTIVE ASSETS</u>		
Actuarial value of assets		\$566,041,931
Present value of future contributions		
City and member normal contributions	\$193,587,210	
Unfunded accrued liability contributions	<u>118,345,234</u>	
Total prospective contributions		<u>311,932,444</u>
Total assets		<u>\$877,974,375</u>



SOLVENCY TEST
(dollar amounts in millions)

Valuation Date	Aggregate Accrued Liabilities For			Reported Assets	Portion of Accrued Liabilities Covered by Reported Assets		
	(1) Active Member Contributions	(2) Retirees and Beneficiaries	(3) Active Members (Employer Financed Portion)		(1)	(2)	(3)
7/1/19	\$92.7	\$384.3	\$207.4	\$566.0	100%	100%	42.9%
7/1/18	94.9	340.1	191.6	548.7	100	100	59.3
7/1/17	92.8	328.2	183.2	520.6	100	100	54.4
7/1/16 ²	92.2	297.9	174.4	490.9	100	100	57.8
7/1/15	89.8	261.1	153.6	467.5	100	100	75.9
7/1/14	89.6	235.5	153.1	425.2	100	100	65.4
7/1/13	87.7	216.9	147.0	381.3	100	100	52.2
7/1/12	84.8	202.8	144.3	367.2	100	100	55.2
7/1/11	77.9	191.7	139.3	366.1	100	100	69.3
7/1/10 ¹	73.4	185.9	136.0	357.7	100	100	72.4

¹Economic and demographic assumptions were changed as of July 1, 2010 due to an experience review.

²Economic and demographic assumptions were changed as of July 1, 2016 due to an experience review.



SCHEDULE C

DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS

(1)	Actuarial Value of Assets as of July 1, 2018	\$548,684,512
(2)	Market Value of Assets as of July 1, 2019	558,868,579
(3)	Market Value of Assets as of July 1, 2018	551,892,495
(4)	Net Cash Flow During Plan Year	
	(a) Contributions	20,803,000
	(b) Benefit Payments and Administrative Expenses	<u>36,708,000</u>
	(c) Net Cash Flow (a) – (b)	(15,905,000)
(5)	Investment Return (2) – (3) – (4c)	22,881,084
(6)	Expected Investment Return [(3) x 7.50%] + [(4)c x 7.50% x 0.5]	40,795,500
(7)	Investment Gain/(Loss) for Phased-In Recognition (5) – (6)	(17,914,416)
(8)	Recognized Amounts for Plan Year	
	(a) Current Year 0.20 x (7)	(3,582,883)
	(b) First Prior Year	1,705,348
	(c) Second Prior Year	4,504,501
	(d) Third Prior Year	(6,966,873)
	(e) Fourth Prior Year	<u>(3,193,174)</u>
	(f) Total Recognized Investment Gain/(Loss)	(7,533,081)
(9)	Actuarial Value of Assets as of July 1, 2019 (1) + (4)(c) + (6) + (8)(f)	<u>\$566,041,931</u>
(10)	Rate of Return on Actuarial Value	6.15%
(11)	Rate of Return on Market Value	4.21%



SCHEDULE D

ASSET INFORMATION

Reconciliation of Market value of Assets (In Thousands)

	Years Ended June 30	
	2019	2018
Market Value of Assets - Beginning of Year	\$551,892	\$519,764
ADDITIONS:		
Contributions:		
Member	10,610	9,909
Employer	10,193	9,333
Total Contributions	20,803	19,242
Investment Income (loss):		
Net Appreciation (depreciation) in fair value of investments	19,113	43,781
Interest	2,721	2,442
Dividends	3,961	3,615
Other	5	3
Total Investment Income	25,800	49,841
Less Investment Expense	2,870	2,860
Net Investment Income (loss)	22,930	46,981
Total Additions	43,733	66,223
DEDUCTIONS:		
Benefits	35,709	33,120
Refunds	416	212
Administration	583	735
Depreciation	49	28
Total Deductions	36,757	34,095
Change in Net Assets	6,976	32,128
Market Value of Assets - End of Year	\$558,868	\$551,892

Allocation of Market Value of Assets

	June 30, 2019	June 30, 2018	June 30, 2017
Cash	\$ 127,164	\$ 136,298	\$ 258,735
Cash Equivalents	6,837,223	6,438,484	4,374,447
Fixed Income Investments	91,348,222	84,689,622	75,940,080
Equity Investments	459,939,506	460,097,119	438,699,029
Other	293,025	266,832	145,100
Accrued Income	666,578	575,010	530,401
Accrued Contributions	374,442	358,535	342,068
Accrued Liabilities/Expenses	(717,581)	(669,405)	(525,497)
Total Market Value	\$ 558,868,579	\$ 551,892,495	\$ 519,764,363



SCHEDULE E

OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS

The assumptions and methods used in the valuation were selected by the Actuary and adopted by the Board January 21, 2016.

INVESTMENT RATE OF RETURN: 7.50% per year, compounded annually, including 3.00% inflation.

SALARY INCREASES: Representative values of the assumed annual rates of salary increases are as follows:

<u>Years of Service</u>	<u>Rate*</u>
≤ 5	9.00%
6	7.25
7	7.00
8	6.50
9	5.50
10 - 14	4.75
15	4.25
16+	3.75

*Includes inflation of 3.00% and real rate of salary increase component of 0.75%

SEPARATIONS FROM ACTIVE SERVICE: For death rates, the RP 2000 Employee Mortality Table set back 2 years for males and projected generationally with Scale AA was used. Representative values of the assumed annual rates of separation from active service are as follows:

<u>Age</u>	<u>Annual Rate of</u>	
	<u>Withdrawal</u>	<u>Disability*</u>
20	1.40%	0.04%
25	1.10	0.04
30	0.90	0.06
35	0.60	0.16
40	0.45	0.29
45	0.25	0.43
50		0.70
55		1.00

*65% of the disabilities are assumed to be in the line of duty.



Annual Rate of Retirement*

Age	Age 60 with 5 Years but with less than 25 Years of Service	25 Years of Service*	30 Years of Service
< 50		6%	40%
50		25	40
51 – 56		25	30
57 – 64	12%	20	30
65	100	100	100

*An additional 10% are assumed to retire when first eligible at 25 years of service from age 50 to age 53, an additional 25% are assumed to retire when first eligible at 25 years of service from age 54 to age 56, and an additional 30% are assumed to retire when first eligible at 25 years of service for ages greater than 56.

DEATHS AFTER RETIREMENT: The RP-2000 Combined Mortality Table projected generationally with Scale AA is used for the period after service retirement. The RP-2000 Combined Mortality Table set forward 1 year for males and set forward 2 years for females, and projected generationally with Scale AA is used for dependent beneficiaries. The RP-2000 Disabled Retiree Mortality Table set back 6 years for males and set forward 1 year for females is used for the period after disability retirement.

EXPENSES: 0.75% of payroll.

PERCENT MARRIED: 100% of active members are assumed to be married with the male three years older than his spouse.

ASSETS: Actuarial value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected actuarial value of assets, based on the assumed valuation rate of return. The amount recognized each year is 20% of the difference between market value and expected actuarial value.

VALUATION METHOD: Entry age actuarial cost method. See Schedule F for a brief description of this method.

UNUSED SICK AND VACATION DAYS: 17.3% load on Final Average Salary at Retirement for cashed-in vacation and sick days. In addition, 2/3 year added to credited service at retirement.

PAYROLL GROWTH ASSUMPTION: 3.00% per year.



SCHEDULE F

ACTUARIAL COST METHOD

1. The valuation is prepared on the projected benefit basis, under which the present value, at the interest rate assumed to be earned in the future (currently 7.50%), of each member's expected benefits at retirement or death is determined, based on age, service and sex. The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service, disability or survivor's benefit. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members and beneficiaries to obtain the present value of all expected benefits payable from the System on account of the present group of members and beneficiaries.
2. The employer contributions required to support the benefits of the System are determined following a level funding approach, and consist of a normal contribution and an accrued liability contribution.
3. The normal contribution is determined using the entry age actuarial cost method. Under this method, a calculation is made to determine the level percentage of payroll which, if applied for the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.
4. The unfunded accrued liability is determined by subtracting the present value of prospective employer normal contributions and member contributions, together with the current actuarial value of assets held, from the present value of expected benefits to be paid from the System.



SCHEDULE G

SUMMARY OF MAIN SYSTEM PROVISIONS AS INTERPRETED FOR VALUATION PURPOSES

Member	An employee of the Charlotte Fire Department who is subject to the provisions of the Civil Service Act.
Membership Service Credit	Service for all periods of employment with the Charlotte Fire Department for which contributions have been paid.
Final Average Salary	A member's average monthly compensation for the highest 2 consecutive years within the last 5 years of membership service. Salary in the final year includes cashed-in vacation and sick days.
Accrued Benefit	The monthly amount of retirement benefits earned by a member as of any date computed on his Final Average Salary and Membership Service Credit at that date.
Service Retirement Benefit	
Eligibility	Age 50 and 25 years of membership service credit, age 60 and 5 years of membership service credit or 30 years of membership service credit.
Benefit	Monthly benefit is 2.6% of final average salary multiplied by years of membership service credit. The minimum monthly benefit is \$902.75.
Early Retirement Benefit	
Eligibility	25 years of membership service credit.
Benefit	Accrued benefit reduced by 3% for each year member is under age 50.
In the Line of Duty Disability Retirement Benefit	
Eligibility	No requirements.
Benefit	78% of final average salary or normal retirement benefit if greater.
Not in the Line of Duty Disability Retirement Benefit	
Eligibility	10 years of service.
Benefit	39% of final average salary plus 1.95% of such salary for each year of membership service credit in excess of 10 years, not less than \$902.75 per month.



Deferred Vested
Retirement Benefit

Eligibility

5 years of service. Member contributions not withdrawn.

Benefit

Accrued benefit payable at age 60. A member may choose a refund of contributions with 4% interest in lieu of this benefit.

Termination Benefit

If a member is terminated with less than 5 years of membership service credit, he is entitled to a return of his accumulated contributions.

Death Benefit

If a member dies in service, his beneficiary is entitled to receive a lump sum equal to the return of the member's accumulated contributions, plus those contributions made by the City on his behalf, plus interest of 4% per year. In lieu of the lump sum, his beneficiary may elect an annuity which is the actuarial equivalent of the lump sum. If the deceased member was eligible for a service or early retirement on the day before death, the spouse may elect to receive the actuarial equivalent monthly benefit under the 66-2/3% Joint and Survivor Option.

Optional Forms of Benefit

- (1) 10 year certain and life annuity.
- (2) 100%, 75%, 66-2/3% or 50% joint and survivorship annuity.
- (3) Joint and survivorship annuity with a pop-up provision.

Contributions

The City and the members each contribution 12.65%.



SCHEDULE H

TABLES OF MEMBERSHIP DATA

TABLE 1

**DISTRIBUTION OF ACTIVE MEMBERS BY AGE AND SERVICE GROUPS
AS OF JULY 1, 2019**

Attained Age	Completed Years of 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 & Over	
Under 25 Total Pay	12	25	1							38 \$1,883,394
25 to 29 Total Pay	19	74	32							125 \$7,066,368
30 to 34 Total Pay	17	81	83	48	1					230 \$14,928,449
35 to 39 Total Pay	4	23	31	77	39					174 \$13,090,013
40 to 44 Total Pay		6	19	39	95	41	1			201 \$16,387,077
45 to 49 Total Pay		2	4	19	44	74	26			169 \$14,407,787
50 to 54 Total Pay				5	11	47	16	3		82 \$6,928,936
55 to 59 Total Pay					4	13	6	2		25 \$2,078,058
60 to 64 Total Pay						1		1	1	3 \$270,773
65 to 69 Total Pay										0 \$0
70 & up Total Pay										0 \$0
Total Count Total Pay	52	211	170	188	194	176	49	6	1	1,047 \$77,040,854

Average Age: 39.0
Average Service: 12.6



TABLE 2
NUMBER OF RETIRED MEMBERS AND BENEFICIARIES
AND THEIR BENEFITS BY AGE

Attained Age	Number of Members	Total Annual Benefits	Average Annual Benefits
50 & Under	29	\$ 1,573,433	\$54,256
51 - 55	112	6,967,413	62,209
56 - 60	152	8,638,996	56,836
61 - 65	143	7,530,140	52,658
66 - 70	110	5,109,965	46,454
71 - 75	93	3,325,070	35,753
76 - 80	57	2,552,687	44,784
Over 80	54	2,022,005	37,445
Total	750	\$37,719,709	\$50,293

TABLE 3
SCHEDULE OF ACTIVE MEMBER VALUATION DATA

<u>Valuation Date</u>	<u>Number Prior Year</u>	<u>Exits</u>	<u>New Entrants & Rehires</u>	<u>Number Current Year</u>	<u>Annual Payroll</u>	<u>Annual Average Pay</u>	<u>% Increase in Average Pay</u>
7/1/2019	1,058	63	52	1,047	\$77,040,854	\$73,582	8.5%
7/1/2018	1,037	31	52	1,058	71,781,041	67,846	-0.4%
7/1/2017	1,030	56	63	1,037	70,610,001	68,091	5.0%
7/1/2016	1,029	46	47	1,030	66,796,597	64,851	1.4%
7/1/2015	1,027	59	61	1,029	65,820,571	63,966	2.3%
7/1/2014	1,026	43	44	1,027	64,190,190	62,503	2.6%
7/1/2013	1,028	36	34	1,026	62,523,240	60,939	2.4%
7/1/2012	1,028	32	32	1,028	61,158,264	59,492	3.5%
7/1/2011	1031	30	27	1,028	59,086,270	57,477	0.3%
7/1/2010	991	25	65	1031	59,079,990	57,304	-0.2%
7/1/2009	957	22	56	991	56,890,253	57,407	-0.5%



TABLE 4
SCHEDULE OF RETIRED MEMBERS AND BENEFICIARIES
ADDED TO AND REMOVED FROM ROLLS

<u>Year Ended</u>	<u>Rolls – Beginning of Year</u>		<u>Added to Rolls</u>		<u>Removed from</u>		<u>Rolls – End of</u>		<u>% Increase in Annual Allowances</u>	<u>Average Annual Allowances</u>
	<u>No.</u>	<u>Annual Allowances</u>	<u>No.</u>	<u>Annual Allowances</u>	<u>No.</u>	<u>Annual Allowances</u>	<u>No.</u>	<u>Annual Allowances</u>		
7/1/2019	697	\$33,569,732	66	\$4,586,146	13	\$436,169	750	\$37,719,709 **	12.4%	\$50,293
7/1/2018	684	32,289,898	26	1,699,726	13	419,892	697	33,569,732	4.0%	48,163
7/1/2017	647	29,422,479	52	3,411,374	15	543,955	684	32,289,898	9.7%	47,207
7/1/2016	615	27,388,370	46	2,517,541	14	483,432	647	29,422,479	7.4%	45,475
7/1/2015	575	24,864,206	52	2,879,892	12	355,728	615	27,388,370	10.2%	44,534
7/1/2014	546	23,015,232	42	2,222,162	13	373,188	575	24,864,206	8.0%	43,242
7/1/2013	522	21,528,876	33	1,745,808	9	259,452	546	23,015,232	6.9%	42,152
7/1/2012	505	20,386,139	28	1,478,178	11	335,441	522	21,528,876	5.6%	41,243
7/1/2011	492	19,428,912	22	1,180,748	9	223,521	505	20,386,139	4.9%	40,369
7/1/2010	477	18,461,651	22	1,136,772	7	169,511	492	19,428,912	5.2%	39,490
7/1/2009	466	17,656,422 *	23	1,176,339	12	371,110	477	18,461,651	4.6%	38,704

* Includes 4.00% benefit adjustment effective January 1, 2008.

** Includes benefit increases due to Kurzel lawsuit