CITY OF LADUE FIREMEN AND POLICEMEN'S PENSION PLAN

Actuarial Valuation Report
January 1, 2020

Prepared by

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Introduction and Purpose

In this report, we present the results of the January 1, 2020 actuarial valuation for the City of Ladue Firemen and Policemen's Pension Plan. The report has been prepared at the request of the City for the sole use of the City of Ladue Firemen and Policemen's Pension Plan and the City of Ladue as the contributing plan sponsor.

Purposes of the Valuation

The actuarial valuation of the Plan is intended to accomplish several purposes:

(a) The determination of the employer contributions under the funding policy for the 2020 calendar year

(b) Assessment of the relative funded position of the plan on an ongoing basis, i.e., through a comparison of plan assets and projected plan liabilities

Actuarial Certification

As requested, we have performed an actuarial valuation of the City of Ladue Firemen and Policemen's Pension Plan as of January 1, 2020 for determining contributions for the calendar year ending December 31, 2020. Our findings are set forth in this actuary's report. This report reflects the benefit provisions in effect on January 1, 2020.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by the City and The Commerce Trust Company. This information includes, but is not limited to, plan provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for the Plan have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of the Plan and reasonable expectations).

This valuation report is only an estimate of the Plan's financial condition as of a single date. It can neither predict the Plan's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of Plan benefits, only the timing of Plan contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Future actuarial measurements may differ significantly from the current measurements 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. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The City has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in this report.

Actuarial computations presented in this report are for purposes of determining the funding policy contribution amounts for the City. The calculations in the enclosed report have been made on a basis consistent with our understanding of the City's funding requirements and goals as well as our understanding of the plan provisions described on pages 16-18 of this report. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

Actuarial Certification

Milliman's work is prepared solely for the internal business use of the City of Ladue. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

(a) The City may provide a copy of Milliman's work, in its entirety, to the Plan's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the Plan.

(b) The City may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and has been prepared in accordance with generally recognized accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

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Consulting Actuary
Joint Board Enrollment #20-03686

William Winningham, EA, MAAA
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Discussion of Valuation Results

Funding Policy Contribution

The results of this valuation are used to determine the contribution rates under the funding policy to the Plan for the 2020 plan year. A comparison of policy contribution rates for the current and immediately preceding valuations is shown below:

	Valuation Date **January 1, 2019**	Valuation Date **January 1, 2020**
Applies to Calendar Year	01/01/19-12/31/19	01/01/20-12/31/20
Funding Policy Contribution (with interest)	$1,834,700	$1,690,108
Actual Employer Contribution	$1,834,700	N/A

The funding policy contribution decreased from $1,834,700 to $1,690,108. The funding policy contribution decreased primarily due to liability gains and a decrease in the rate of future mortality improvements under the MP-2019 improvement scale.

Plan Assets

The unaudited market value of plan assets increased from $32,599,549 at January 1, 2019 to $38,451,363 at January 1, 2020. A balance sheet and statement of income and disbursements are presented on pages 6 and 7, respectively. The net market rate of return was 19.4% versus the prior year assumed rate of 7% resulting in a gain for the period.

The actuarial value of assets increased from $35,377,311 at January 1, 2019 to $37,264,050 at January 1, 2020. The development of the January 1, 2020 actuarial value of assets is presented on page 8. The net actuarial rate of return for the period was 6.6% vs. the assumed rate of 7.0%.

Due to the asset smoothing method used, there are $1,187,313 of investment gains that have not yet been recognized in the Actuarial Value of Assets (see page 8).

Actuarial Assumptions, Methods and Plan Provisions

The projection scale used for the mortality assumption was changed from MP-2018 to MP-2019

All other actuarial assumptions, methods and plan provisions remained the same as the prior year. Descriptions of these can be found on pages 13-18.

Plan Population

The number of active members included in the valuation increased from 58 to 59 from the previous valuation to the current valuation. The number of members in pay status remained at 67. The number of deferred vested members increased from 4 to 5 . A detailed reconciliation can be found on page 21.

GASB 67/68 Disclosures

The GASB disclosures are presented in a separate report.

Summary of Valuation Results

	Valuation Date January 1, 2019	Valuation Date January 1, 2020
Number of Members		
Active	58	59
Receiving Payments	67	67
Terminated Vested	4	5
Terminated Nonvested Refunded	0	0
Total	129	131
Annual Payroll of Members under Normal Retirement Age	5,295,617	5,433,772
Market Value of Assets	32,599,549	38,451,363
Actuarial Value of Assets	35,377,311	37,264,050
Present Value of Future Benefits	51,473,670	51,208,629
Entry Age Accrued Liability	43,169,720	42,999,057
Unfunded Entry Age Accrued Liability	7,792,409	5,735,007
Entry Age Normal Cost	795,815	784,328
Expected Employee Contributions (reflects first 3% of contributions only)	158,869	163,013
Assumed Expenses	25,000	25,000
Funding Policy Contribution, with Interest	1,834,700	1,690,108
Funding Policy Contribution as a Percentage of Covered Payroll	34.6%	31.1%

Statement of Assets as of January 1, 2020

Assets	Market Value
Cash and Equivalents	568,265
Fixed Incomve Investments	6,923,417
Corporate Stocks - Domestic	15,747,904
Corporate Stocks - International	7,665,854
Real Estate	4,444,919
Alternate Investments	3,031,262
Accounts Receivable	69,742
Total Assets	38,451,363
Liabilities	
None	
Net Assets	$38,451,363

Statement of Income and Disbursements

Market Value of Assets as of January 1, 2019	$32,599,549
Income	
City Contributions	1,834,700
Employee Contributions	324,694
Investment Income (Including Realized and Unrealized Capital Gain/Losses)	5,734,127
Interest and Dividends	695,448
Other Income	0
Change in Accrued Income	(50,771)
Total Income	8,538,198
Expenses	
Employee Benefit Distributions	2,573,553
Investment Expenses	94,731
Administrative Expenses	18,100
Total Expenses	2,686,384
Net Increase (Decrease)	5,851,814
Market Value of Assets as of December 31, 2019	$38,451,363
Rate of Return	19.4%

Development of Actuarial Value of Assets

1. Actuarial Value of Assets as of January 1, 2019	$35,377,311
2. Contributions	2,159,394
3. Benefit Payments	(2,573,553)
4. Expenses	(18,100)
5. Expected Return at 7.00%	2,461,283
6. Expected Actuarial Value of Assets as of December 31, 2019 = (1) + (2) + (3) + (4) + (5)	37,406,335
7. Market Value of Assets as of December 31, 2019	38,451,363
8. Adjustments on Market Value (See Schedule of Market Value Adjustments below)	(142,285)
9. Actuarial Value of Assets as of December 31, 2019 = (6) + (8), but not less than 80% of (7) nor more than 120% (7)	$37,264,050

Schedule of Market Value Adjustments

Plan Year	Gain/(Loss) Base	Unrecognized Balance 1/1/2019	12/31/2019 Adjustment	Unrecognized Balance 1/1/2020
2015	(2,182,040)	(436,408)	(436,408)	0
2016	(25,266)	(10,107)	(5,054)	(5,053)
2017	2,348,618	1,409,171	469,724	939,447
2018	(4,675,523)	(3,740,418)	(935,105)	(2,805,313)
2019	3,822,790	N/A	764,558	3,058,232
Total	N/A	(2,777,762)	(142,285)	1,187,313

Actuarial Balance Sheet

The key elements of the actuarial funding process are illustrated in the Actuarial Balance Sheet. The format of the balance sheet captures the essential purpose of an actuarial cost method - the determination of assets sufficient to provide for pension benefits.

The Actuarial Present Value of Current and Prospective Plan Benefits is the liability that must be balanced by Current and Prospective assets. The Present Value of Future Normal Cost Contributions represents the prospective assets from contributions that will be made for costs allocated to the future.

	January 1, 2020
Liabilities	
1. Actuarial Present Value of Future Benefits	
a. Active Members	$23,044,926
b. Terminated Vested Members	1,261,273
c. Retired Members	22,215,057
d. Beneficiaries	1,809,473
e. Disabled Members	2,877,900
f. Total	51,208,629
Assets	
1. Current Valuation Assets	
a. Actuarial Value of Assets	37,264,050
2. Prospective Valuation Assets	
a. Unfunded Actuarial Accrued Liability	5,735,007
b. Present Value of Future Normal Cost Contributions	8,209,572
3. Total	51,208,629

Development of Funding Policy Contribution

	January 1, 2020
1. Entry Age Accrued Liability	
a. Active Members	$14,835,354
b. Terminated Vested Members	1,261,273
c. Retired Members	22,215,057
d. Beneficiaries	1,809,473
e. Disabled Members	2,877,900
f. Total	42,999,057
2. Actuarial Value of Assets	37,264,050
3. Funded Ratio: (2) / (1f)	86.7%
4. Entry Age Unfunded Accrued Liability: (1f) - (2)	5,735,007
5. Entry Age Normal Cost:	784,328
6. Expected Employee Contributions:*	163,013
7. Assumed Expenses at Beginning of Year ($25,000 at mid year)	24,168
8. Normal Cost Including Expenses: (5) - (6) + (7)	645,483
9. Covered Payroll	5,433,772
10. Amortization of Unfunded Actuarial Accrued Liability	1,031,260
11. Funding Policy Contribution at Beginning of Year: (8) + (10)	1,676,743
12. Funding Policy Contribution, with Interest to Expected Payment Date	1,690,108
13. Funding Policy Contribution as a Percentage of Payroll	31.1%

*Reflects first 3% of employee contributions

Determination of Amortization Charges for the Funding Policy Contribution

Date Incurred	Description	Initial Balance	Initial Amortization Period	Unamortized Base January 1, 2019	Contribution to Base	Unamortized Base January 1, 2020	Amortization Payment
1/1/2013	Initial Unfunded Accrued Liability	12,814,062	20	7,320,299	1,208,414	6,624,305	1,130,427
1/1/2014	Experience Gain	(961,835)	20	(701,577)	(90,705)	(659,983)	(84,851)
1/1/2015	Experience Gain	(417,005)	20	(366,675)	(39,325)	(353,018)	(36,787)
1/1/2016	Experience Loss	457,069	20	415,617	43,104	401,606	40,322
1/1/2017	Assumption Changes	1,703,516	20	1,596,365	160,648	1,547,463	150,280
1/1/2017	Experience Gain	(503,306)	20	(471,649)	(47,463)	(457,201)	(44,400)
1/1/2018	Assumption Changes	(207,036)	20	(199,396)	(19,524)	(193,830)	(18,264)
1/1/2018	Experience Gain	(644,345)	20	(620,563)	(60,765)	(603,237)	(56,843)
1/1/2019	Assumption Changes	(20,096)	20	(20,096)	(1,895)	(19,608)	(1,773)
1/1/2019	Experience Gain	840,086	20	840,086	79,223	819,669	74,110
1/1/2020	Assumption Changes	(111,881)	20	N/A	N/A	(111,881)	(9,870)
1/1/2020	Experience Gain	(1,259,278)	20	N/A	N/A	(1,259,278)	(111,091)
Total		11,689,951		7,792,411	1,231,712	5,735,007	1,031,260

Determination of (Gain)/Loss for Plan Year Ending December 31, 2019

1. Unfunded Accrued Liability as of January 1, 2019	$7,792,409
2. Employer Normal Cost as of January 1, 2019	636,946
3. Assumed Expenses as of January 1, 2019	24,168
4. Interest on (1), (2) and (3) at 7.00%	591,747
5. Employer Contributions for the Prior Plan Year	1,834,700
6. Interest on (5) at 7.00%	104,404
7. Change in Unfunded Accrued Liability due to Assumption Change	(111,881)
8. Expected Unfunded Actuarial Accrued Liability as of December 31, 2019 = (1) + (2) + (3) + (4) - (5) - (6) + (7)	6,994,285
9. Entry Age Accrued Liability as of December 31, 2019	42,999,057
10. Actuarial Value of Assets as of December 31, 2019	37,264,050
11. Unfunded Actuarial Accrued Liability as of December 31, 2019	5,735,007
12. (Gain)/Loss for Plan Year Ending December 31, 2019 = (11) - (8)	(1,259,278)

Actuarial Methods and Assumptions

Interest (adopted 01/01/2013)

7.00% per annum, compounded annually

Salary Increases (adopted 01/01/2013)

4.50% per annum, compounded annually

Inflation (adopted 01/01/2013)

2.50% per annum

Mortality (adopted 01/01/2020)

Healthy Lives: RP-2014 Healthy Annuitant Mortality Projected Generationally from 2006 using MP-2019 Projection Scale.

Disabled Lives: RP-2014 Disabled Mortality Projected Generationally from 2006 using MP-2019 Projection Scale.

Withdrawal

Rates vary by age. Rates at selected ages are:

Age	Percent Withdrawing
20	10.0%
25	8.0%
30	5.5%
35	3.4%
40	1.4%
45	0.2%
50	0.0%

Retirement (adopted 01/01/2017)

Rates vary by age as follows:

Age	Percent Retiring
55	50%
56-58	20%
59	50%
60	100%

Terminated vested participants are assumed to retire at age 55.

Actuarial Methods and Assumptions

Disability 1985 Pension Disability Table – Class 3. Disabilities are assumed to be 75% duty related. Rates at selected ages are:

Age	Percent Becoming Disabled
20	0.14%
25	0.20%
30	0.30%
35	0.42%
40	0.59%
45	0.82%
50	1.22%
55	2.09%
60	3.10%

Administrative Expenses $25,000 per year

Marriage 80% of members are assumed to be married at the time of withdrawal, retirement, death or disability. Males are assumed to be 4 years older than their

Children of Active Employees

Active members are assumed to have one child. Each child is assumed to be born at a member's age 28.

Form of Payment All members are assumed to elect the Life Annuity with a 50% postretirement death benefit payable to a spouse and eligible children, with the exception that those who terminate prior to retirement are assumed to elect a return of contributions.

Actuarial Cost Method (adopted 01/01/2013)

The Entry Age Normal Cost Method on a closed group basis was used. Normal costs are computed as a level percent of pay. The Entry Age Normal Unfunded Accrued Liability (UAL) is amortized on a level dollar basis over a closed 20 year period with future changes in UAL resulting in separate 20-year amortization bases.

Actuarial Methods and Assumptions

Asset Valuation Method

An asset valuation method is used to help smooth short term fluctuations in market value. The actuarial value of assets is equal to the prior year's actuarial value of assets adjusted as follows:

1. increased with actual contributions for the year;
2. reduced by actual benefit payments and expenses for the year;
3. increased by expected investment income calculated using the assumed rate of return
4. increased by phased in investment gains/(losses)
5. limited to no less than 80% of market value and no more than 120% of market value

Each year, the amount of investment gain/(loss) to be phased in is equal to the excess of the plan's market value over the sum of the expected asset value and the unrecognized balances of investment gains/(losses) for the previous five years. 20% of this amount plus 20% of the similar amounts calculated in each of the four preceding years are summed and recognized as the amount of phased-in gains recognized in the current year.

Summary of Plan Provisions

A summary of the current primary provisions of the Plan is presented below. A complete description of the provisions can be found in Ordinance 1932, as amended by Ordinances 2032 and 2056

Effective Date	Originally effective May 1, 1947; most recently restated effective November 19, 2007 and most recently amended December 17, 2012.
Eligibility	Any salaried uniformed employee of the Fire Department or Police Department of the City of Ladue becomes eligible after his first hour of employment.
Employee Contributions	Each Employee shall contribute 6.0% of salary to the Pension Fund in 2014 and thereafter. Contributions accumulate at an interest rate of 4% as established by the Board of Trustees.
Salary	Calendar year compensation paid to an employee by the City of Ladue, including LTD premiums, temporary disability payments, and employee contributions to an eligible deferred compensation plan, cafeteria plan, or transportation expense program.
Final Average Salary (FAS)	Average monthly salary during the last 60 months of employment, or average monthly salary during an employee’s entire employment if employed less than 60 months. The FAS for a disabled participant is determined as of the Date of Disability.
Career Average Salary (CAS)	Average monthly salary during an employee’s entire employment. The CAS for a disabled participant is determined as of the Date of Disability.
Years of Service	Sum of continuous periods of service from date of hire to date of termination, including periods on LTD, Family and Medical Leave, and absences without pay lasting less than 31 consecutive days. Does not include partial years of service.

Summary of Plan Provisions

Normal Retirement

Eligibility: Age 55 with 10 Years of Service.

Benefit: Employees hired prior to January 1, 2013:

Less than 20 Years of Service: 2% of CAS multiplied by Years of Service.

At least 20 Years of Service: 40% of FAS + 2.5% of FAS multiplied by Years of Service in excess of 20 up to a maximum of 10.

Employees hired on or after January 1, 2013:

Less than 30 Years of Service: 2% of CAS multiplied by Years of Service.

At least 30 Years of Service: 60% of FAS.

Disability Benefit

Eligibility: 10 years of Credited Service including period of Disability.

Benefit: Disability Benefits are paid outside the Plan by the City's Long-Term Disability Plan for disabilities that occur after January 1, 2008. Upon attaining Early or Normal Retirement eligibility, a disabled member is entitled to the Early or Normal Retirement Benefit based on FAS at Date of Disability and Credited Service including the period while on LTD.

Early Retirement

Eligibility: Age 50 with 10 Years of Service.

Benefit: Accrued Benefit based on FAS or CAS and Years of Service at retirement actuarially reduced for early commencement.

Deferred Retirement

A member may defer his pension after age 55 upon discretion of the City Council.

Summary of Plan Provisions

Vested Termination Benefit

Less than 10 Years of Service: Refund of contributions with interest.

At least 10 Years of Service: Either refund of contributions with interest or the participant's Accrued Benefit based on FAS or CAS and Credited Service at termination actuarially adjusted for date of retirement.

Death Benefit

Active Duty: 50% of FAS plus 10% of FAS for each Dependent Child to a maximum of three.

Active Non-Duty: 5% of FAS multiplied by Years of Service up to a maximum of 24% of FAS plus 2% of FAS multiplied by Years of Service up to a maximum of 10% of FAS for each Dependent Child to a maximum of three.

Duty Disability (Disabled prior to January 1, 2008):

40% of FAS plus 10% of FAS for each Dependent Child to a maximum of three.

Non-Duty Disability (Disabled prior to January 1, 2008):

Two thirds of the benefit the disabled retiree was receiving plus one third of the benefit the disabled retiree was receiving for each Dependent Child to a maximum of three.

Cost-of-Living Adjustment (COLA)

Benefits commencing on or after April 17, 1972 are adjusted each January 1 for an annual COLA based on the Consumer Price Index on September 30 prior to the adjustment date. COLAs are limited to a maximum annual increase of 2% and a lifetime maximum of 20%. If the CPI is less than 1% during a year, there shall be no adjustment, and if the CPI is negative, there shall be no adjustment unless the decrease is 2% or more. Retirees and disabled members (who became disabled prior to January 1, 2008) first become eligible for the COLA on the second January 1st following retirement.

Normal Form of Payment

Life Annuity with a 50% post retirement death benefit payable to a spouse (who has attained age 50) and eligible children (single and below age 18).

Summary of Member Data

	January 1, 2019	January 1, 2020
Active Members		
Count	58	59
Plan Compensation	$5,388,679	$5,528,322
Average Compensation	$92,908	$93,700
Average Age	41.8	41.5
Average Service	12.5	12.0
Retired Members (Including Beneficiaries and Disableds)		
Count*	67	67
Total Monthly Benefits	$212,496	$217,750
Average Monthly Benefits	$3,172	$3,250
Terminated Vested Members		
Count	4	5
Total Monthly Benefits	$9,022	$10,791
Average Monthly Benefits	$2,256	$2,158
Terminated Nonvested Due Refund of Contributions		
Count	0	0
Employee Contributions	$0	$0

*Includes 2 Children and 2 Alternate Payees

Distribution of Active Members by Age and by Years of Service
(as of January 1, 2020)

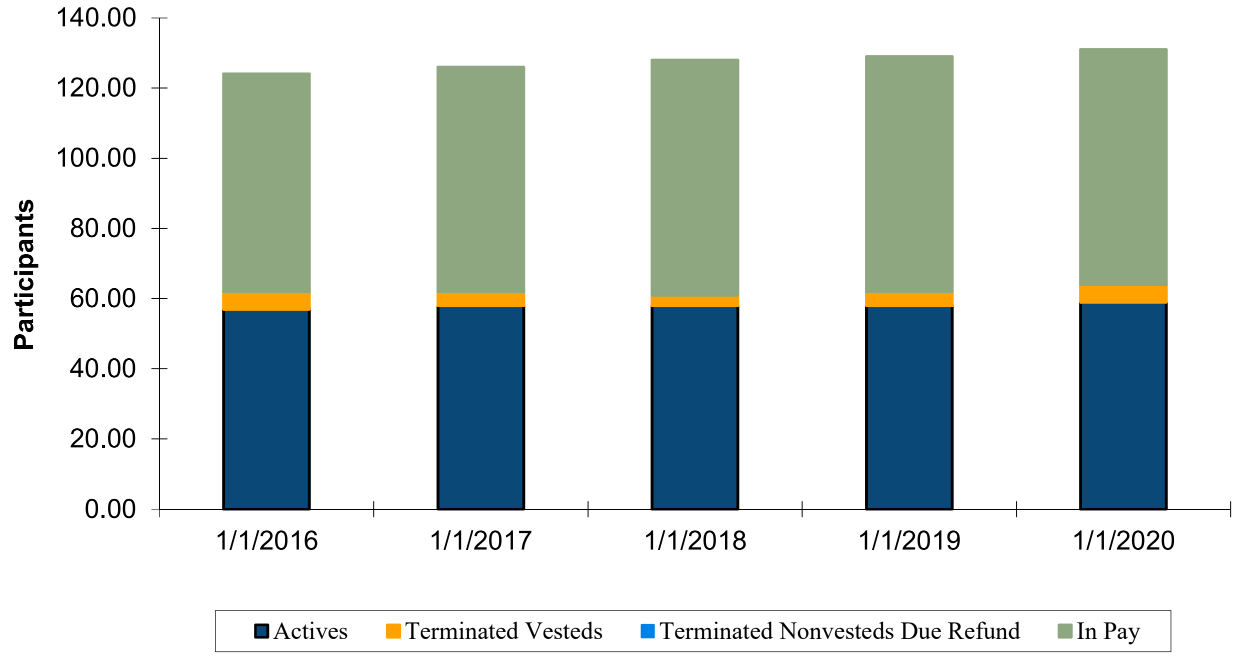
Attained Age	Years of Credited Service Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 and up	Total
Under 25	1	0	0	0	0	0	0	0	0	0	1
25 to 29	2	2	0	0	0	0	0	0	0	0	4
30 to 34	0	4	6	0	0	0	0	0	0	0	10
35 to 39	0	3	4	2	1	0	0	0	0	0	10
40 to 44	1	0	4	2	4	0	0	0	0	0	11
45 to 49	0	1	2	6	3	4	0	0	0	0	16
50 to 54	0	0	0	0	1	2	2	0	0	0	5
55 to 59	0	0	0	0	0	0	0	1	0	0	1
60 to 64	0	0	0	0	0	1	0	0	0	0	1
65 to 69	0	0	0	0	0	0	0	0	0	0	0
70 and up	0	0	0	0	0	0	0	0	0	0	0
Total	4	10	16	10	9	7	2	1	0	0	59

Summary of Changes in Member Data

	Active Members	Members in Pay Status	Terminated Vested Members	Total
Count as of January 1, 2019	58	67	4	129
New Entrants	4	0	0	4
Rehired	0	0	0	0
Retired	(2)	2	0	0
Became Disabled	0	0	0	0
Lump Sum Payouts	0	0	0	0
Died with Beneficiary	0	0	0	0
New Beneficiaries / Alternate Payees	0	0	0	0
Died without Beneficiary	0	(2)	0	(2)
Terminated with Vesting	0	0	0	0
Terminated without Vesting	(1)	0	1	0
Data Corrections	0	0	0	0
Total Changes	1	0	1	2
Count as of January 1, 2020	59	67	5	131

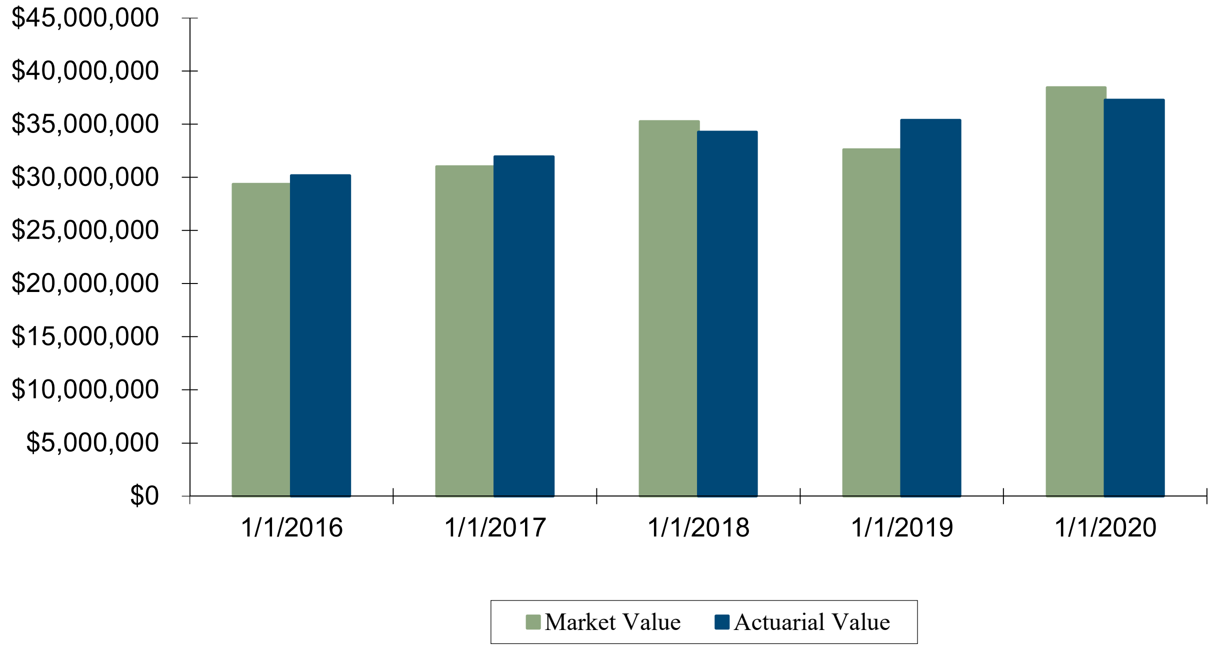
*Members in Pay Status includes 2 Children and 2 Alternate Payees

Member Data



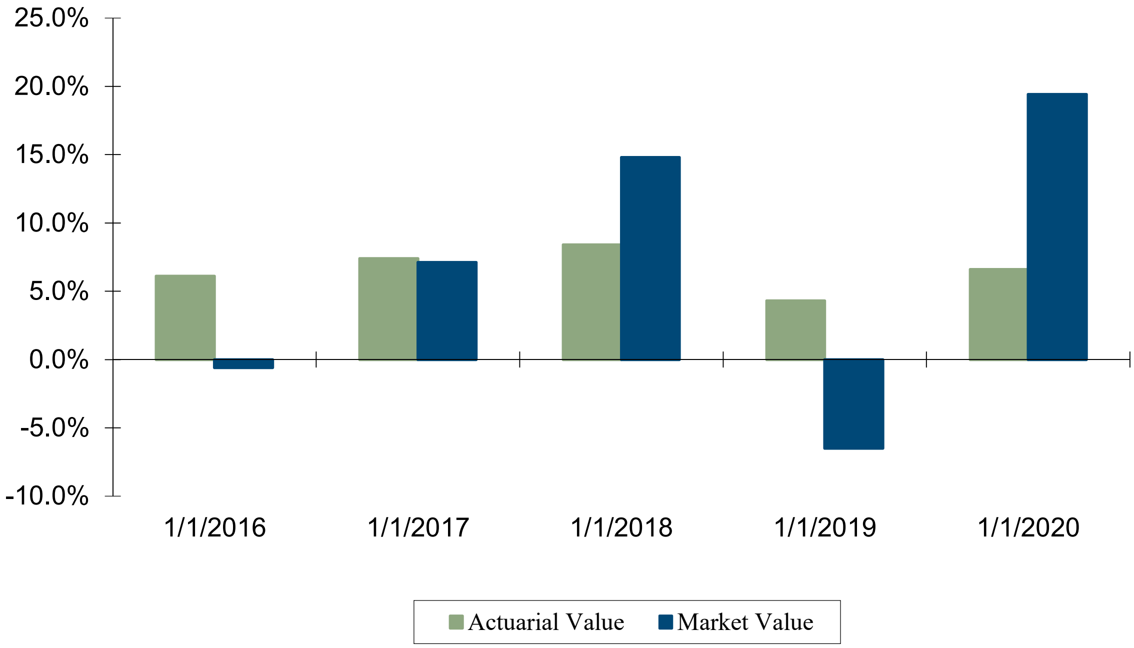
Valuation Date	1/1/2016	1/1/2017	1/1/2018	1/1/2019	1/1/2020
Actives	57	58	58	58	59
Terminated Vesteds	5	4	3	4	5
Terminated Nonvesteds Due Refund	0	0	0	0	0
In Pay	62	64	67	67	67
Total	**124**	**126**	**128**	**129**	**131**

Total Assets



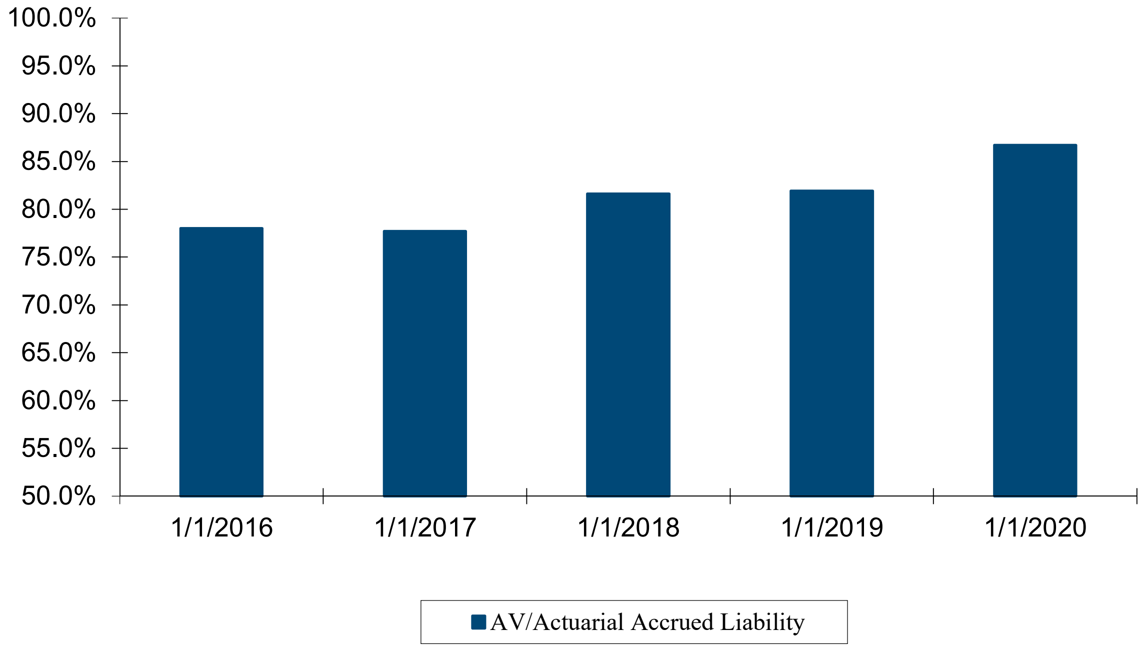
Valuation Date	Market Value	Actuarial Value
1/1/2016	$29,355,447	$30,147,660
1/1/2017	$30,994,503	$31,925,044
1/1/2018	$35,240,462	$34,265,500
1/1/2019	$32,599,549	$35,377,311
1/1/2020	$38,451,363	$37,264,050

Rate of Return (%) on Total Assets



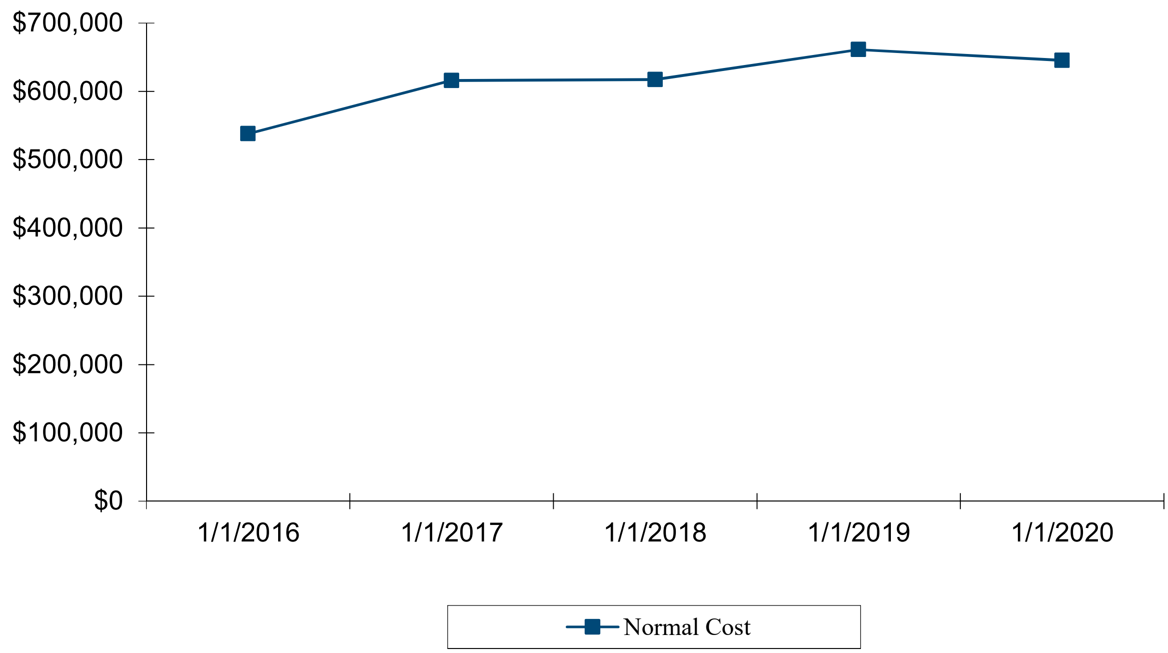
Valuation Date	Actuarial Value	Market Value
1/1/2016	6.1%	-0.6%
1/1/2017	7.4%	7.1%
1/1/2018	8.4%	14.8%
1/1/2019	4.3%	-6.5%
1/1/2020	6.6%	19.4%

Funded Ratio: Actuarial Value of Assets (AVA) vs. Actuarial Accrued Liability (AAL)



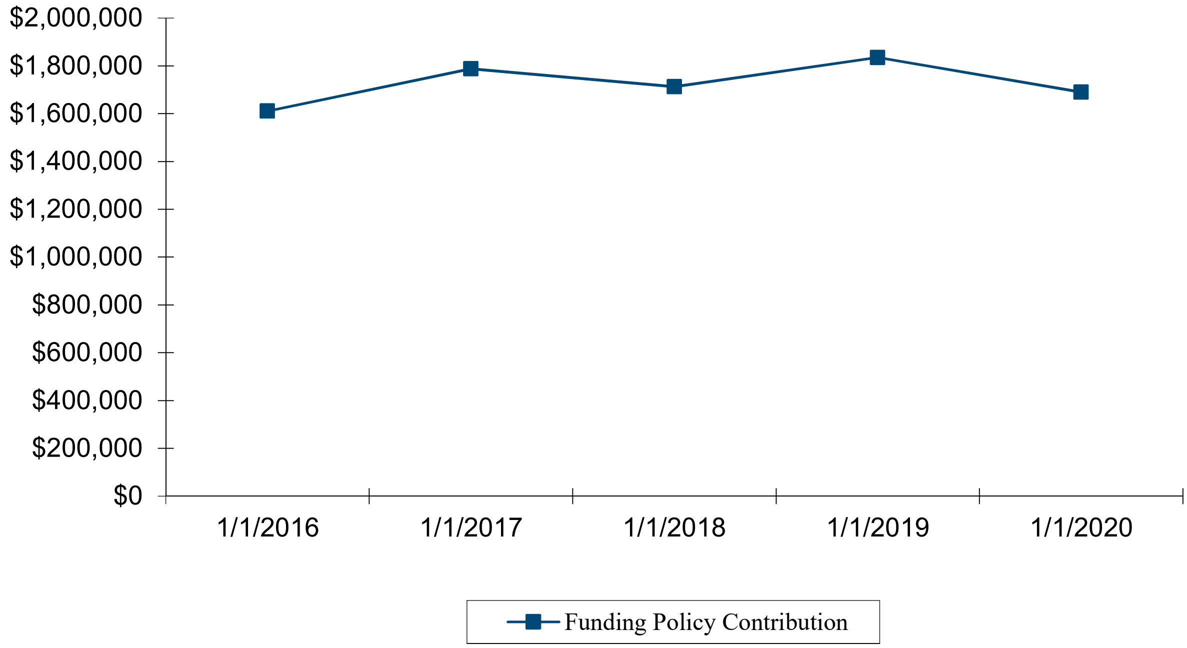
Valuation Date	AVA/AAL
1/1/2016	78.0%
1/1/2017	77.7%
1/1/2018	81.6%
1/1/2019	81.9%
1/1/2020	86.7%

Employer Normal Cost



Valuation Date	Normal Cost
1/1/2016	$537,859
1/1/2017	$615,732
1/1/2018	$617,236
1/1/2019	$661,114
1/1/2020	$645,483

Funding Policy Contribution



Valuation Date	Funding Policy Contribution
1/1/2016	$1,610,554
1/1/2017	$1,787,046
1/1/2018	$1,712,937
1/1/2019	$1,834,700
1/1/2020	$1,690,108

Actuarial Standard of Practice (ASOP 51)

The purpose of this appendix is to identify, assess, and provide illustrations of risks that are significant to the Plan, and in some cases to the Plan's participants.

The results of the actuarial valuation are based on one set of reasonable assumptions. However, it is almost certain that future experience will not exactly match the assumptions. As an example, investments may perform better or worse than assumed in any single year and over any longer time horizon. It is therefore important to consider the potential impacts of these potential differences when making decisions that may affect the future financial health of the Plan, or of the Plan's participants.

In addition, as plans mature they accumulate larger pools of assets and liabilities. This increases the potential risk to plan funding and the finances of those who are responsible for plan funding. As an example, it is more difficult for a plan sponsor to deal with the effects of a 10% investment loss on a plan with $1 Billion in assets and liabilities than if the same plan sponsor is responsible for a 10% investment loss on a plan with $1 Million in assets and liabilities. Since pension plans make long-term promises and rely on long-term funding, it is important to consider how mature the plan is today, and how mature it may become in the

Actuarial Standard of Practice No. 51 (ASOP 51) addresses these issues by providing actuaries with guidance for assessing and disclosing the risk associated with measuring pension liabilities and the determination of pension plan contributions. Specifically, it directs the actuary to:

- Identify risks that may be significant to the plan.
- Assess the risks identified as significant to the plan.
- Disclose plan maturity measures and historical information that are significant to understanding the plan's risks.

ASOP 51 states that if in the actuary's professional judgment, a more detailed assessment would be significantly beneficial in helping the individuals responsible for the plan to understand the risks identified by the actuary, then the actuary should recommend that such an assessment be performed.

This appendix uses the framework of ASOP 51 to communicate important information about: significant risks to the Plan, the Plan's maturity, and relevant historical Plan data.

Maturity Risk	Definition:	This is the potential for total plan liabilities to become more heavily weighted toward inactive liabilities over time.
	Identification:	The Plan is subject to maturity risk because as Plan assets and liabilities continue to grow, the impact of any gains or losses on the assets or liabilities also becomes larger.
	Assessment:	Currently assets are equal to 17.8 times last year's contributions indicating a one-year asset loss of 10% would be equal to 1.78 times last year's contributions.

Actuarial Standard of Practice (ASOP 51)

Retirement Risk	Definition:	This is the potential for participants to retire and receive subsidized benefits more valuable than expected.
	Identification:	This plan has valuable early retirement benefits. If participants retire at earlier ages than anticipated by the actuarial assumptions, it is expected that additional funding will be required.
Investment Risk	Definition:	The potential that investment returns will be different than expected.
	Identification:	To the extent that actual investment returns differ from the assumed investment return, the plan's future assets, funding contributions and funded status may differ significantly from
Interest Rate Risk	Definition:	The potential that interest rates will be different than expected.
	Identification:	The pension liabilities reported herein have been calculated by computing the present value of expected future benefit payments using the interest rate(s) described in the appendix. If interest rate(s) in future valuations are different from those used in this valuation, future pension liabilities, funding contributions and funded status may differ significantly from those presented in this valuation. As a general rule, using a higher interest rate to compute the present value of future benefit payments will result in a lower pension liability, and vice versa. One aspect that can be used to estimate the impact of different interest rates is the plan's duration.
	Assessment:	If the interest rate changes by 1%, the estimated percentage change in pension liability is approximately 12%.
Demographic Risk	Definition:	The potential that mortality or other demographic experience will be different than expected.
	Identification:	The pension liabilities reported herein have been calculated by assuming that participants will follow patterns of demographic experience (e.g. mortality, withdrawal, disability, retirement, form of payment election, etc.) as described in the appendix. If actual demographic experience or future demographic assumptions are different from what is assumed to occur in this valuation, future pension liabilities, funding contributions and funded status may differ significantly from those presented in this valuation.