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, 2020	January 1, 2021
Active Members		
Count	59	59
Plan Compensation	$5,528,322	$5,811,363
Average Compensation	$93,700	$98,498
Average Age	41.5	40.9
Average Service	12.0	11.2
Retired Members (Including Beneficiaries and Disableds)		
Count*	67	66
Total Monthly Benefits	$217,750	$219,330
Average Monthly Benefits	$3,250	$3,323
Terminated Vested Members		
Count	5	6
Total Monthly Benefits	$10,791	$14,392
Average Monthly Benefits	$2,158	$2,399
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, 2021)

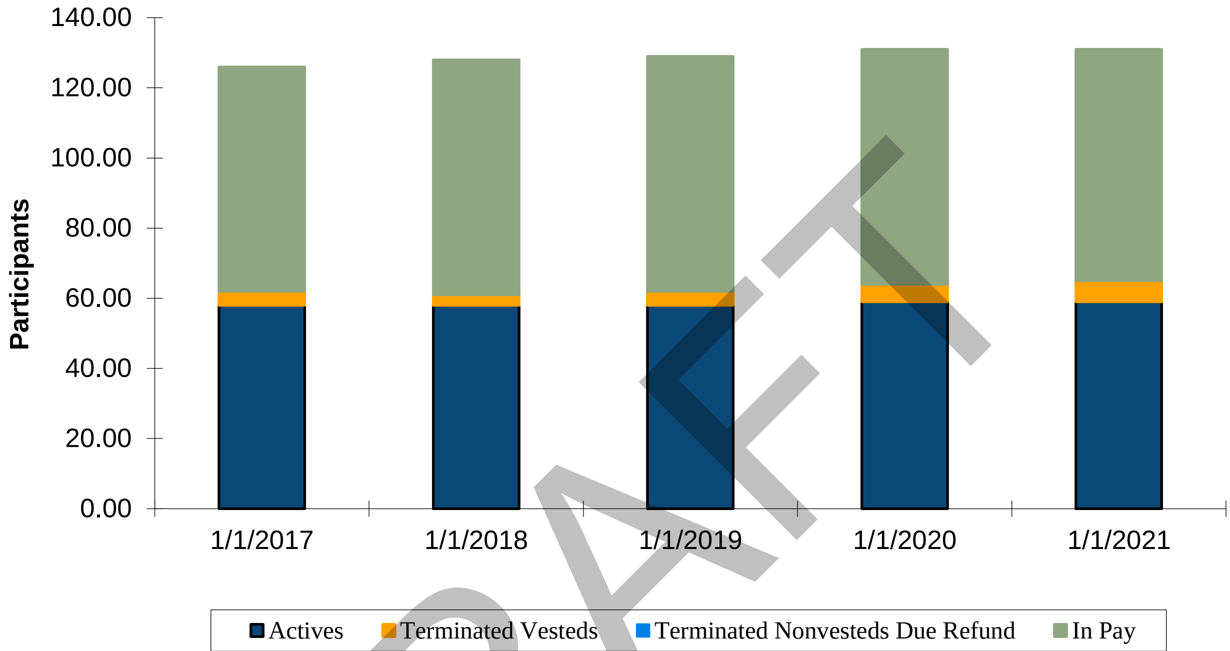
	Years of Credited Service										
Attained Age	**Under 1**	**1 to 4**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 to 39**	**40 and up**	**Total**
Under 25	1	1	0	0	0	0	0	0	0	0	2
25 to 29	3	3	0	0	0	0	0	0	0	0	6
30 to 34	1	1	2	1	0	0	0	0	0	0	5
35 to 39	2	1	6	3	0	0	0	0	0	0	12
40 to 44	0	1	4	2	6	1	0	0	0	0	14
45 to 49	0	0	1	6	3	2	0	0	0	0	12
50 to 54	0	0	1	0	1	2	3	1	0	0	8
55 to 59	0	0	0	0	0	0	0	0	0	0	0
60 to 64	0	0	0	0	0	0	0	0	0	0	0
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	7	7	14	12	10	5	3	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, 2020	59	67	5	131
New Entrants	7	0	0	7
Rehired	0	0	0	0
Retired	(2)	3	0	1
Became Disabled	0	(1)	0	(1)
Lump Sum Payouts	0	0	0	0
Died with Beneficiary	0	(2)	0	(2)
New Beneficiaries / Alternate Payees	0	2	0	2
Died without Beneficiary	0	(3)	0	(3)
Terminated with Vesting	(1)	0	1	0
Terminated without Vesting	(4)	0	0	(4)
Data Corrections	0	0	0	0
Total Changes	0	(1)	1	0
Count as of January 1, 2021	59	66	6	131

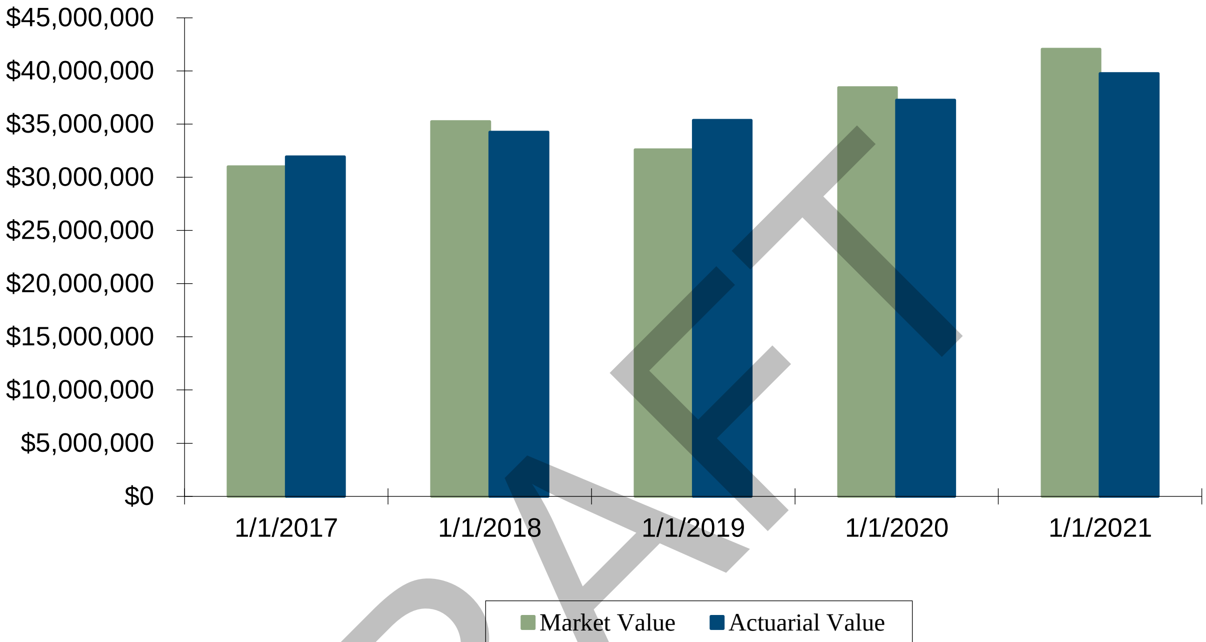
*Members in Pay Status includes 3 Alternate Payees

Member Data



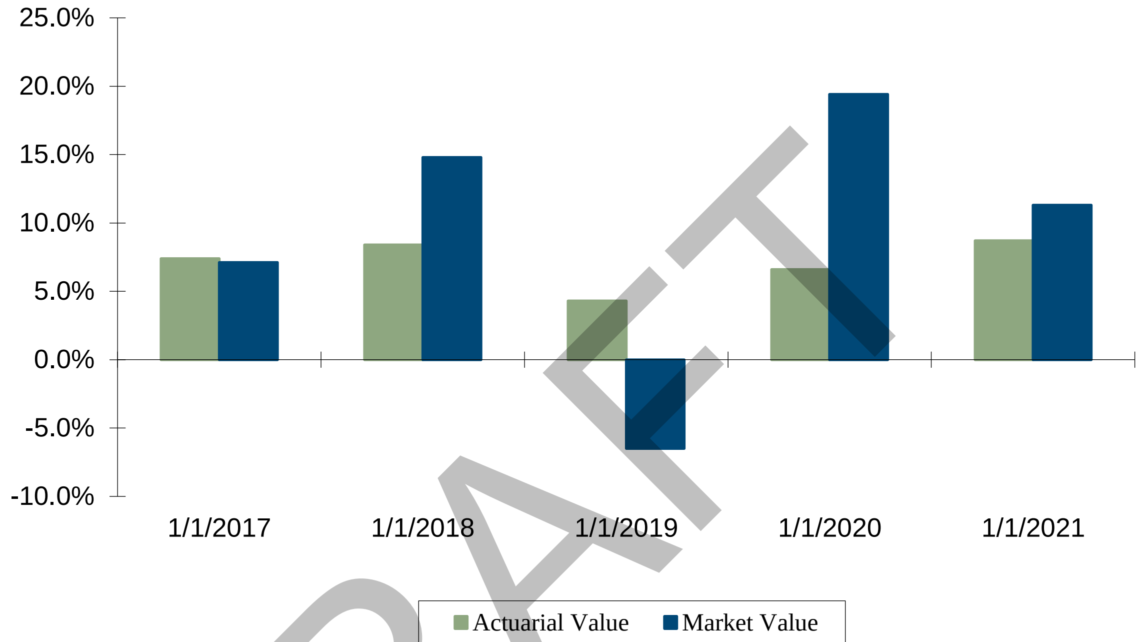
Valuation Date	1/1/2017	1/1/2018	1/1/2019	1/1/2020	1/1/2021
Actives	58	58	58	59	59
Terminated Vesteds	4	3	4	5	6
Terminated Nonvesteds Due Refund	0	0	0	0	0
In Pay	64	67	67	67	66
Total	**126**	**128**	**129**	**131**	**131**

Total Assets



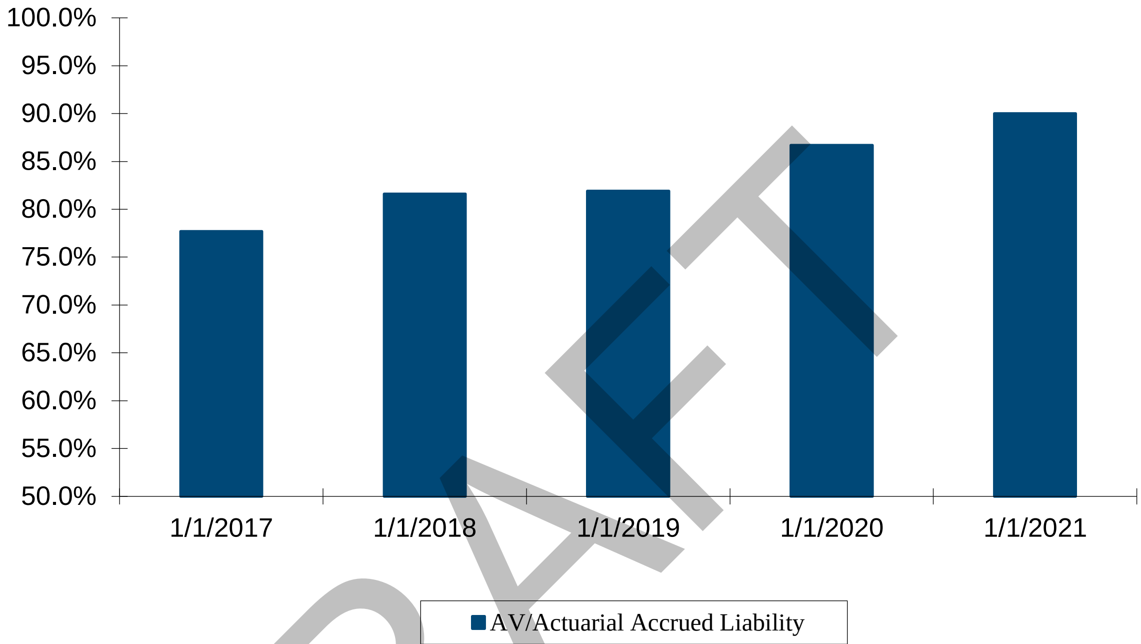
Valuation Date	Market Value	Actuarial Value
1/1/2017	$30,994,503	$31,925,044
1/1/2018	$35,240,462	$34,265,500
1/1/2019	$32,599,549	$35,377,311
1/1/2020	$38,451,363	$37,264,050
1/1/2021	$42,056,622	$39,776,584

Rate of Return (%) on Total Assets



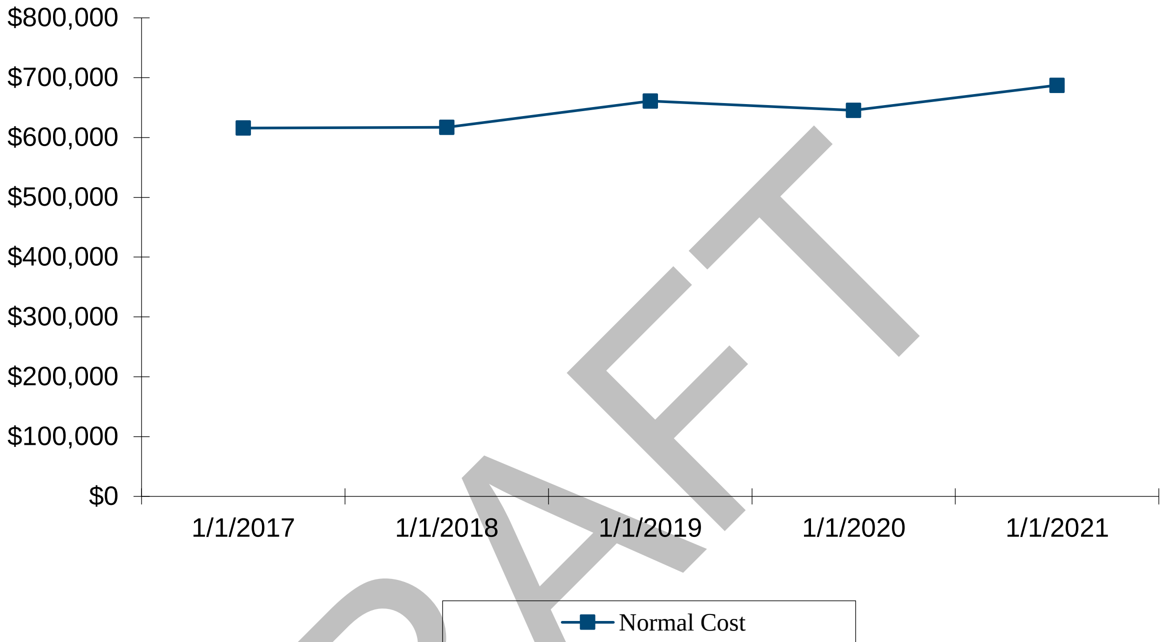
Valuation Date	Actuarial Value	Market Value
1/1/2017	7.4%	7.1%
1/1/2018	8.4%	14.8%
1/1/2019	4.3%	-6.5%
1/1/2020	6.6%	19.4%
1/1/2021	8.7%	11.3%

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



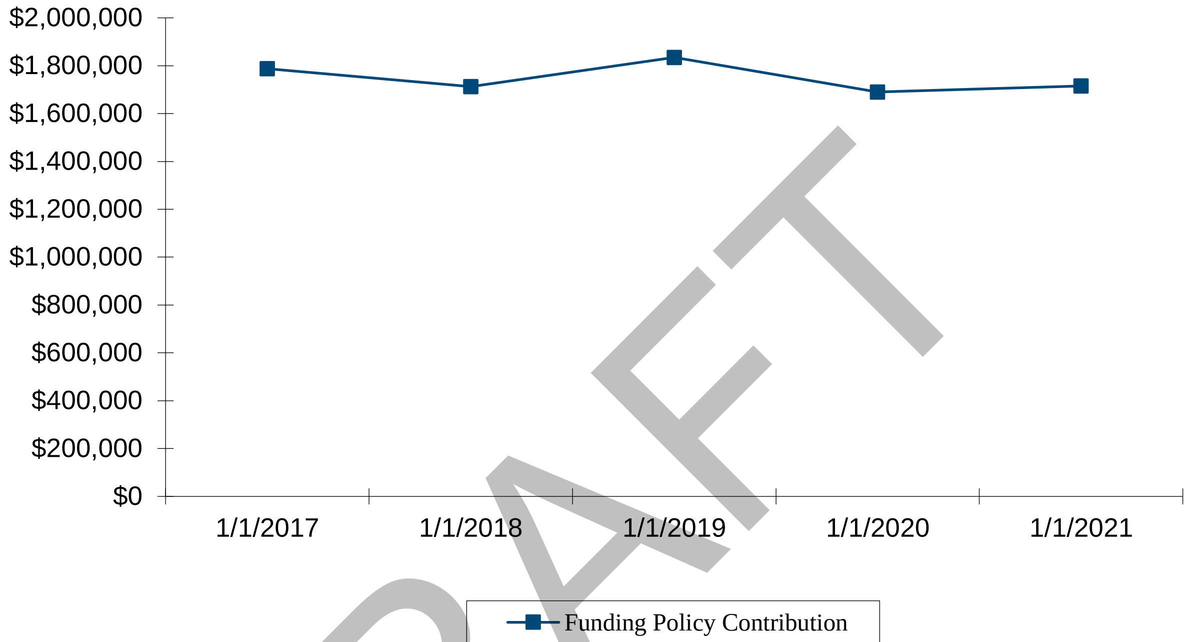
Valuation Date	AVA/AAL
1/1/2017	77.7%
1/1/2018	81.6%
1/1/2019	81.9%
1/1/2020	86.7%
1/1/2021	90.0%

Employer Normal Cost



Valuation Date	Normal Cost
1/1/2017	$615,732
1/1/2018	$617,236
1/1/2019	$661,114
1/1/2020	$645,483
1/1/2021	$687,367

Funding Policy Contribution



Valuation Date	Funding Policy Contribution
1/1/2017	$1,787,046
1/1/2018	$1,712,937
1/1/2019	$1,834,700
1/1/2020	$1,690,108
1/1/2021	$1,715,333

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.