Actuarial Methods and Assumptions

Retirement (adopted 01/01/2020)

Rates vary by age as follows:

Age	Percent Retiring
60	20%
61	10%
62	30%
63	20%
64	10%
65	100%

Terminated vested participants are assumed to retire at Normal Retirement Age.

Disability

Rates vary by age and gender. Rates at selected ages are:

Age	Male Percent Becoming Disabled	Female Percent Becoming Disabled
35	0.00%	0.00%
40	0.05%	0.10%
45	0.10%	0.20%
50	0.20%	0.30%
55	0.31%	0.45%
60	0.45%	0.63%
65	0.00%	0.00%

Administrative Expenses $20,000 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

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 1931,as amended.

Effective Date

Originally effective January 1, 1968; most recently restated effective November 19, 2007 and amended August 26, 2019.

Eligibility

Any regular, full-time, permanent employee of the City of Ladue who is not covered by the City of Ladue Firemen and Policemen's Pension Plan becomes eligible the first day of the month following hire date.

Employee Contributions

Employees are no longer required to contribute to the Pension Fund. Contributions accumulate at an interest rate of 4% as established by the Retirement Committee.

Compensation

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 Compensation (FAC)

Average monthly salary during the highest 36 consecutive months of salary within the last 120 months of employment, or average monthly salary during an employee's entire employment if employed less than 36 months. The FAC for a disabled participant is determined as of the Date of Disability.

Credited Service

Completed months of continuous service from date of hire to date of termination, including periods on disability and Family and Medical Leave.

Normal Retirement (adopted 01/01/2020)

Eligibility: Age 62

Benefit: 1.50% of FAC multiplied by Credited Service not in excess of 35 years.

Members who terminated on or after January 1, 2000 are also entitled to a refund of any accumulated employee contributions with interest.

Summary of Plan Provisions

Disability Benefit

Eligibility:	10 years of Credited Service including period of Disability.
Benefit:	The Disability Benefit is 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 FAC at Date of Disability and Credited Service including the period while on LTD.

Early Retirement (adopted 01/01/2020)

Eligibility:	Age 55 with 10 years of Credited Service.
Benefit:	Accrued Benefit based on FAC and Credited Service at retirement actuarially reduced for early commencement.
	Members who terminated on or after January 1, 2000 are also entitled to a refund of any accumulated employee contributions with interest.

<u>In addition, employees who terminated on or after September 1, 2019:</u>

Eligibility:	Age 60 with 5 years of Credited Service
Benefit:	Accrued Benefit based on FAC and Credited Service at retirement unreduced for early commencement plus a refund of any accumulated employee contributions with interest.

Summary of Plan Provisions

Termination Benefit (adopted 01/01/2020)

All members who terminated on or after January 1, 2000 are entitled to a refund of any accumulated employee contributions with interest.

Employees terminated before September 1, 2019;

A member with at least 10 years of Credited Service is also entitled to his Accrued Benefit based on FAC and Credited Service at termination actuarially adjusted for date of retirement.

Employees terminated on or after September 1, 2019:

A member with at least 5 years of Credited Service is also entitled to his Accrued Benefit based on FAC and Credited Service at termination actuarially adjusted for date of retirement.

Late Retirement Benefit

Accrued Benefit based on FAC and Credited Service at retirement.

Members who terminated on or after January 1, 2000 are also entitled to a refund of any accumulated employee contributions with interest.

Pre-Retirement Death Benefit

The spouse of a member who has completed 10 years of Credited Service or attained age 62 is entitled to the amount the spouse would have received had the member retired any time after attaining age 55 and elected the 100% Joint and Survivor Annuity, based on FAC and Credited Service at the time of death.

Normal Form of Payment

Joint & 50% Survivor Annuity for married members, Single Life Annuity for single members.

Summary of Plan Provisions

Cost-of-Living Adjustment (COLA) (adopted 01/01/2020)

Benefits commencing on or after September 1, 2019 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 first become eligible for the COLA on the second January 1st following retirement.

Summary of Member Data

	January 1, 2020	January 1, 2021
Active Members		
Count	29	24
Plan Compensation	$2,012,165	$1,810,552
Average Compensation	$69,385	$75,440
Average Age	47.6	47.5
Average Service	11.3	12.5
Retired Members (Including Beneficiaries and Disableds)		
Count	24	24
Total Monthly Benefits	$25,196	$22,838
Average Monthly Benefits	$1,050	$952
Terminated Vested Members		
Count	4	5
Total Monthly Benefits	$3,258	$4,497
Average Monthly Benefits	$815	$899

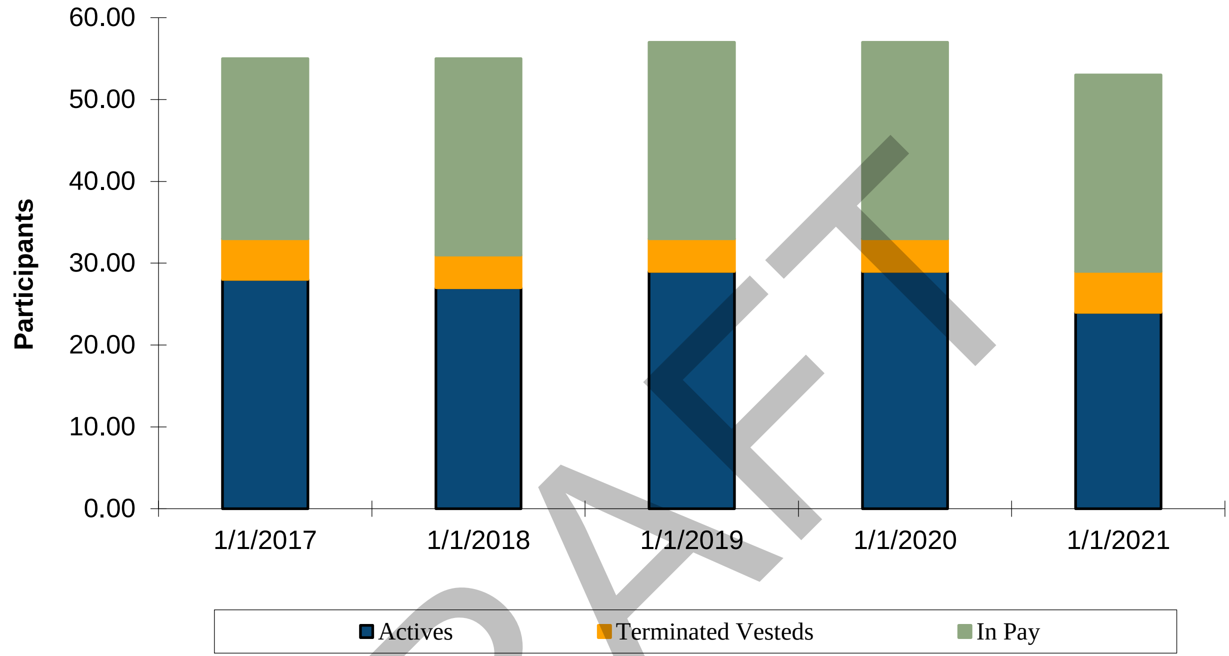
Distribution of Active Members by Age and by Years of Service
(as of January 1, 2021)

	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	0	0	0	0	0	0	0	0	0	1
25 to 29	0	0	0	0	0	0	0	0	0	0	0
30 to 34	0	1	3	0	0	0	0	0	0	0	4
35 to 39	0	2	0	0	0	0	0	0	0	0	2
40 to 44	0	0	1	0	0	0	0	0	0	0	1
45 to 49	0	1	0	0	0	5	0	0	0	0	6
50 to 54	1	0	0	0	0	0	1	1	0	0	3
55 to 59	1	2	1	0	0	0	0	0	0	0	4
60 to 64	0	1	0	0	0	0	1	0	0	1	3
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	3	7	5	0	0	5	2	1	0	1	24

Summary of Changes in Member Data

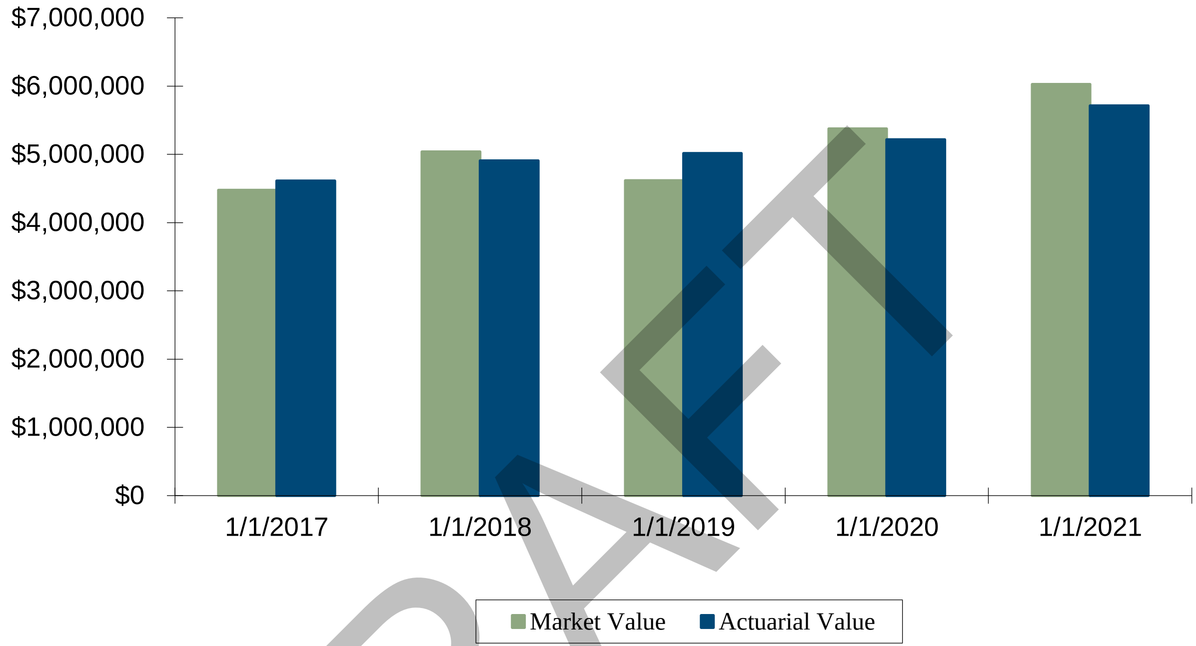
	Active Members	Members in Pay Status	Terminated Vested Members	Total
Count as of January 1, 2020	29	24	4	57
New Entrants	3	0	0	3
Rehired	0	0	0	0
Retired	0	0	0	0
Became Disabled	0	0	0	0
Lump Sum Payouts	0	0	0	0
Died with Beneficiary	(1)	0	0	(1)
New Beneficiaries / Alternate Payees	0	1	0	1
Died without Beneficiary	(1)	(1)	0	(2)
Terminated with Vesting	(1)	0	1	0
Terminated without Vesting	(5)	0	0	(5)
Data Corrections	0	0	0	0
Total Changes	(5)	0	1	(4)
Count as of January 1, 2021	24	24	5	53

Member Data



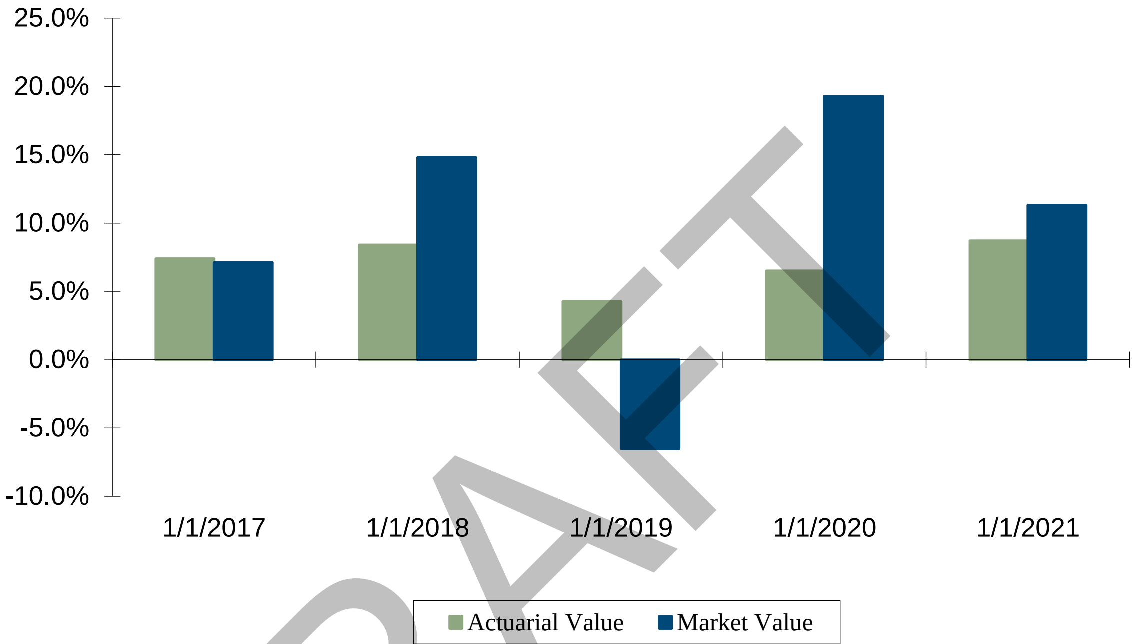
Valuation Date	1/1/2017	1/1/2018	1/1/2019	1/1/2020	1/1/2021
Actives	28	27	29	29	24
Terminated Vesteds	5	4	4	4	5
In Pay	22	24	24	24	24
Total	**55**	**55**	**57**	**57**	**53**

Total Assets



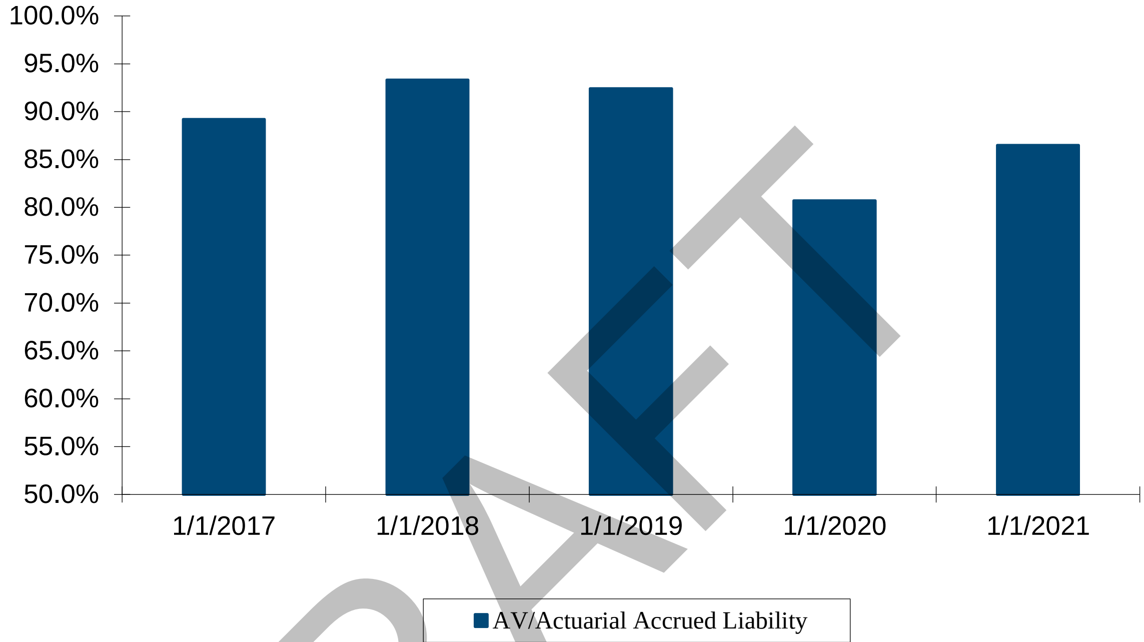
Valuation Date	Market Value	Actuarial Value
1/1/2017	$4,476,167	$4,612,977
1/1/2018	$5,039,720	$4,904,796
1/1/2019	$4,617,332	$5,014,047
1/1/2020	$5,375,209	$5,214,103
1/1/2021	$6,028,867	$5,712,654

Rate of Return (%) on Total Assets



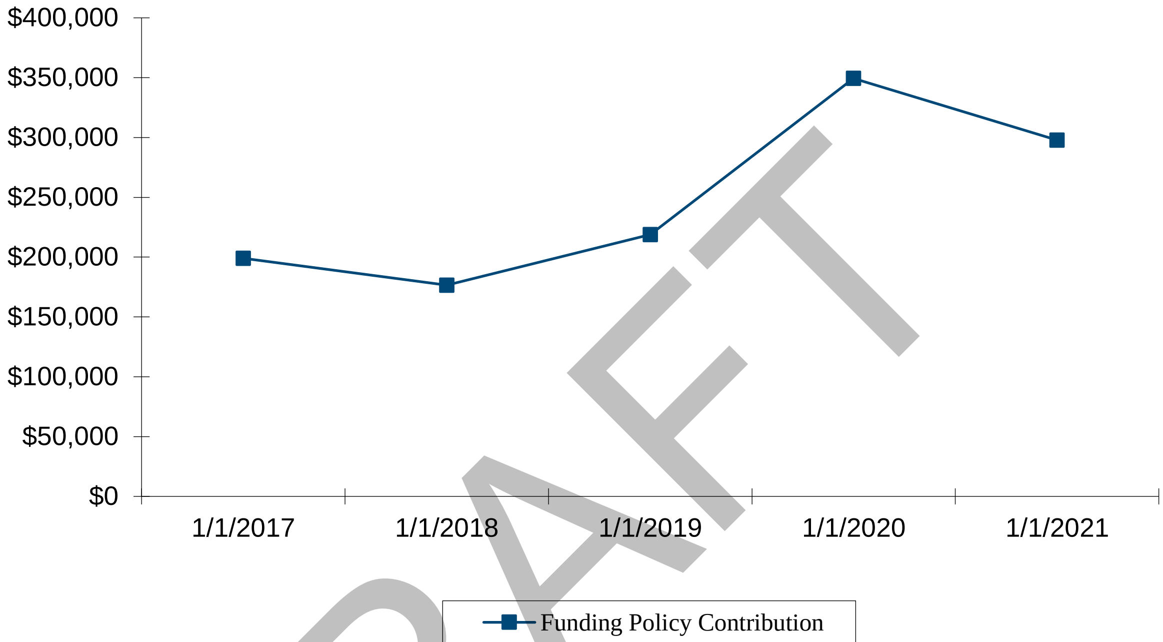
Valuation Date	Actuarial Value	Market Value
1/1/2017	7.4%	7.1%
1/1/2018	8.4%	14.8%
1/1/2019	4.3%	-6.5%
1/1/2020	6.5%	19.3%
1/1/2021	8.7%	11.3%

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



Valuation Date	AVA/AAL
1/1/2017	89.2%
1/1/2018	93.3%
1/1/2019	92.4%
1/1/2020	80.7%
1/1/2021	86.5%

Funding Policy Contribution



Valuation Date	Funding Policy Contribution
1/1/2017	$199,092
1/1/2018	$176,577
1/1/2019	$218,921
1/1/2020	$349,374
1/1/2021	$297,695

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 times last year's contributions indicating a one-year asset loss of 10% would be equal to 1.7 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 14%.
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.