

Actuarial Valuation

City of Waukegan

Waukegan Firefighters' Pension Fund

As of May 1, 2016

For the Year Ending April 30, 2017



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Section 1: Summary of Principal Valuation Results

MWM Consulting Group was retained to prepare an actuarial valuation as of May 1, 2016 for the Waukegan Firefighters' Pension Fund. The purpose of the actuarial valuation was to determine the financial position and the annual actuarial requirements of the pension fund under Illinois statute 40 ILCS 5/3, Section 125, and to develop a recommended minimum contribution amount.

For quick reference, some of the key results of the valuation, along with selected financial and demographic information for the year ending April 30, 2017 are summarized in this overview section along with (for comparison) the results from the prior year.

CONTRIBUTIONS	Item	Current Valuation as of 5/1/2016	Prior Year Valuation as of 5/1/2015
<i>The plan sponsor must contribute at least the statutorily required minimum contribution under Illinois statutes equal to the normal cost plus the amount necessary to amortize the unfunded accrued liability such that by 2040, the liabilities will be 90% funded.</i>		Change in Assumptions	
	Actuarially Determined Contribution	\$6,944,954 (67.6%)	\$5,156,731 (50.9%)
	Statutory Minimum Contribution per 40 ILCS 5/3 Section 125	\$5,429,432 (52.9%)	\$4,069,485 (40.2%)
<i>() amounts expressed as a percentage of payroll</i>			

STATUTORY MINIMUM FUNDING COST ELEMENTS	Item	Current Valuation as of 5/1/2016	Prior Year Valuation as of 5/1/2015
<i>Illinois statutes require employers to contribute at least the amount necessary such that assets will equal at least 90% of the accrued liability by 2040. The minimum amount is determined under the Projected Unit Credit funding method, with smoothed assets, and is equal to the normal cost plus the amortization amount.</i>		Change in Assumptions	
	Accrued Liability	\$ 132,242,026	\$ 109,172,712
	Market Value of Assets	\$ 60,644,651	\$ 61,038,821
	Actuarial (Smoothed) Value of Assets	\$ 62,960,955	\$ 59,728,533
	Normal Cost	\$ 2,010,488	\$ 1,617,646
	Amortization Amount	\$ 3,028,304	\$ 2,122,931
	Statutory Minimum Contribution	\$ 5,429,432	\$ 4,069,485



ACTUARIALLY DETERMINED CONTRIBUTION COST ELEMENTS	Item	Current Valuation as of 5/1/2016		Prior Year Valuation as of 5/1/2015	
<p>The actuarially determined contribution amount is determined under the Entry Age Normal funding method, with smoothed assets, and is equal to the normal cost plus the amortization amount. 90% of the unfunded liability is amortized as a level dollar amount over 24 years on a closed basis.</p>		Change in Assumptions			
	Accrued Liability	\$	133,640,520	\$	110,513,071
	Market Value of Assets	\$	60,644,651	\$	61,038,821
	Actuarial (Smoothed) Value of Assets	\$	62,960,955	\$	59,728,533
	Normal Cost	\$	1,973,572	\$	1,570,219
	Amortization Amount	\$	4,488,246	\$	3,186,476
Actuarially Determined Funding Policy Contribution	\$	6,944,954	\$	5,156,731	

FINANCIAL THUMBNAIL RATIOS	Tests	5/1/2016 Valuation		5/1/2015 Valuation	
<p>This chart summarizes traditional financial ratios as applied to the pension plan. This liquidity ratio relates the cash flow position of the Fund by comparing the investment income plus employer and employee contributions to the annual benefit payments. Maintaining a ratio well above 100% prevents the liquidation of assets to cover benefit payments. The increase in benefits paid over the years is generally a result of the maturing of the pension plan.</p> <p>Coverage of the Accrued Liabilities by the Assets is the Coverage Ratio and is one indication of the long term funding progress of the plan.</p>	Liquidity Ratio (based upon year ended)	93%		185%	
	Coverage Ratio (Market Value Assets)	45.38%		55.23%	
	Annual Benefit Payments (expected)	\$	6,110,339	\$	5,611,166
	Annual Contributions (expected)				
	Members	\$	971,048	\$	958,112
	City	\$	6,944,954	\$	5,156,731

PARTICIPANT DATA SUMMARY	Item	Current Year Valuation as of 5/1/2016			Prior Year Valuation as of 5/1/2015		
		Tier 1	Tier 2	Total	Tier 1	Tier 2	Total
<p>The Actuarial Valuation takes into account demographic and benefit information for active employees, vested former employees, and retired pensioners and beneficiaries. The statistics for the past two years are compared in the chart.</p>	Active Members						
	Vested	80	0	80	80	0	80
	Non-Vested	<u>15</u>	<u>20</u>	<u>35</u>	<u>20</u>	<u>15</u>	<u>35</u>
	Total Active	95	20	115	100	15	115
	Terminated entitled to future benefits	3	4	7	3	2	5
	Retired	67	0	67	62	0	62
	Surviving Spouse	23	0	23	25	0	25
	Minor Dependent	4	0	4	5	0	5
	Disabled	<u>26</u>	<u>0</u>	<u>26</u>	<u>26</u>	<u>0</u>	<u>26</u>
	Total	218	24	242	221	17	238



SECTION 2: VALUATION RESULTS

Significant Events and Issues Influencing Valuation Results

Actuarial valuations are snapshot calculations which incorporate and reflect the experience and events of the past year such as changes in the demographics of the plan participants, gains and losses in the plan assets, changes in actuarial assumptions about future experience and outside influences such as legislation. Some of the more significant issues affecting the Plan's contribution level are described here.

Asset Performance for yearend 4/30/2016

The approximate 0.00% return (not time weighted) on net assets was below the actuarial assumption of 6.50%.

Change in Assumptions

The mortality assumption was changed to RP2000 Blue Collar projected to 2015 using scale AA with a 40% pre-retirement load. The retirement age assumption for ages 65 and over was changed to 100%. The discount rate/rate of return was changed from 7.0% to 6.5%. The impact of these changes was that the liabilities were increased by \$17,164,856 (\$7,912,493 discount rate, \$14,881 retirement age, \$9,237,482 mortality), the actuarially determined contribution by \$1,542,389 and the statutory minimum by \$1,167,586.

Employer Contributions

The employer contribution is expected to exceed the required statutory minimum amount.



ACTUARIAL CERTIFICATION

This is to certify that MWM Consulting Group has prepared an Actuarial Valuation of the Plan as of May 1, 2016 for the purposes of determining statutory contribution requirements for the Fund in accordance with the requirements of 40 ILCS 5/3, Section 125, of determining the funding policy contribution amount (the Actuarially Determined Contribution). The contributions determined are net of contributions made by active member police officers during the year.

The results shown in this report have been calculated under the supervisions of a qualified Actuary as defined in appropriate State statutes. All results are based upon demographic data submitted by the Fund / City, financial data submitted by the Fund, applications of actuarial assumptions, and generally accepted actuarial methods.

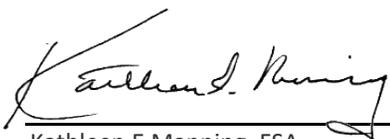
This valuation report has been prepared at the request of City of Waukegan to assist in administering the Plan and meeting specified financial and accounting requirements. This valuation report may not otherwise be copied or reproduced in any form without the consent of the Fund sponsor and may only be provided to other parties in its entirety. The information and valuation results shown in this report are prepared with reliance upon information and data provided to us, which we believe to the best of our knowledge to be complete and accurate and include:

- Employee census data submitted by the City of Waukegan. This data was not audited by us but appears to be consistent with prior information, and sufficient and reliable for purposes of this report.
- Financial data submitted by the Waukegan Firefighters' Pension Fund.

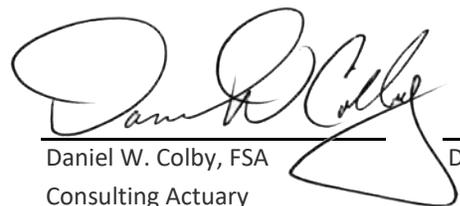
The measurements shown in this actuarial valuation may not be applicable for other purposes. Actuarial valuations involve calculations that require assumptions about future events. Certain of the assumptions or methods are mandated for specific purposes. Future actuarial measurements may differ significantly from the current measurements presented in the report due to such factors as experience that deviates from the assumptions, changes in 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 contributions based on the Plan's funded status) and changes in plan provisions or applicable law. This report does not include an analysis of the potential range of such future measurements.

We believe the assumptions and methods used are within the range of possible assumptions that are reasonable and appropriate for the purposes for which they have been used. In our opinion, all methods, assumptions and calculations are in accordance with requirements and the procedures followed and presentation of results are in conformity with generally accepted actuarial principles and practices. The undersigned actuary meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. There is no relationship between the City of Waukegan and MWM Consulting Group that impacts our objectivity. I certify that the results presented in this report are accurate and correct to the best of my knowledge.

MWM CONSULTING GROUP



Kathleen E Manning, FSA
Managing Principal & Consulting Actuary
MWM Consulting Group



Daniel W. Colby, FSA
Consulting Actuary
MWM Consulting Group

9/8/2016

Date



SECTION 3 - FINANCIAL AND ACTUARIAL EXHIBITS

Exhibit 1 - Statement of Market Value of Assets

Item	Plan Year Ending	
	4/30/2016	4/30/2015
1. Investments at Fair Value:		
a. Cash and Cash equivalents	\$ 0	\$ 0
b. Money Market Mutual Funds	1,608,622	3,683,245
c. Municipal Bonds	9,383,500	7,868,144
d. Corporate Bonds	0	0
e. US Government and Agency Bonds	10,179,156	8,776,183
f. Common and Preferred Stocks	0	0
g. Insurance Contracts (at contract value):	7,565,470	6,752,323
h. Mutual Funds	31,791,207	33,859,687
i. Accrued Interest and receivables	124,592	122,668
j. Other	6,076	516
k. Subtotal Assets (a + b + c + d + e + f + g + h + i + j)	<u>\$ 60,658,623</u>	<u>\$ 61,062,766</u>
2. Liabilities:		
a. Expenses Payable	\$ 13,972	\$ 23,945
b. Liability for benefits due and unpaid	0	0
c. Other Liabilities	0	0
d. Total Liabilities	<u>\$ 13,972</u>	<u>\$ 23,945</u>
3. Net Market Value of Assets Available for Benefits: (1k – 2d)	<u>\$ 60,644,651</u>	<u>\$ 61,038,821</u>



Exhibit 2 - Statement of Change in Net Assets

Item	Plan Year Ending	
	5/1/2016	5/1/2015
Additions		
Contributions		
Employer	\$ 4,401,280	\$ 4,900,036
Plan Member	1,006,352	962,482
Other	0	0
Total Contributions	\$ 5,407,632	\$ 5,862,518
Investment Income		
Net appreciation in fair value of investments	\$ (1,950,151)	\$ 3,151,604
Interest	553,388	530,017
Dividends	665,749	619,753
Other Income	6,318	2,389
Insurance Contracts	813,146	0
Investment Expenses	0	0
Net Investment Income	88,450	4,303,763
Total additions	\$ 5,496,082	\$ 10,166,281
Deductions		
Benefits	\$ 5,697,676	\$ 5,317,565
Refunds	0	0
Administrative and Investment Expenses	192,576	165,924
Total deductions	\$ 5,890,252	\$ 5,483,489
Total increase (decrease)	\$ (394,170)	\$ 4,682,792
Net Market Value of Assets Available for Benefits:		
Beginning of year	\$ 61,038,821	\$ 56,356,029
End of year	<u>\$ 60,644,651</u>	<u>\$ 61,038,821</u>



Exhibit 3 – Actuarial Value of Assets

Under 40 ILCS 5/3, the statutory minimum required contribution is to be determined based upon **Actuarial Value of Assets**, which are asset values which have been smoothed over a five-year period, beginning with the year 2011. The **Actuarial Value of Assets** has been calculated below based upon the market value of assets at May 1, 2016 with adjustments for the preceding year's gains/losses, which are reflected at the rate of 20% per year.

1. Expected Return on Assets	
a. Market Value of Assets as of Beginning of Year	\$ 61,038,821
b. Income and Disbursements During the year	
i. Contributions Received (weighted 50%)	\$ 2,703,816
ii. Benefit Payments and Expenses (weighted 50%)	2,945,126
iii. Weighted net income (other than investment income) (i) – (ii)	(241,310)
c. Market Value adjusted for income and disbursements	\$ 60,797,511
d. Expected Return on Assets at assumed rate of 7.00%	\$ 4,255,826
2. Actual Return on Assets for year	
a. Market Value of Assets (Beginning of Year)	\$ 61,038,821
b. Income (less investment income)	5,407,632
c. Disbursements	5,890,252
d. Market Value of Assets (End of Year)	60,644,651
e. Actual Return on Assets (d) – (a) – (b) + (c)	88,450
f. Investment Gain/(Loss) for year 2(e) - 1(d)	\$ (4,167,376)
3. Actuarial Value of Assets	
a. Market Value of Assets as of End of Year	\$ 60,644,651
b. Deferred Investment gains/(losses)	
i. 80% of 2016 loss of \$(4,167,376)	3,333,901
ii. 60% of 2015 gain of \$345,575	(207,345)
iii. 40% of 2014 gain of \$1,578,592	(631,437)
iv. 20% of 2013 gain of \$894,076	<u>(178,815)</u>
v. Total	2,316,304
c. Actuarial Value of Assets for statutory funding 3(a) + 3(b)(iv)	\$ 62,960,955



Exhibit 4- Determination of the Statutory Minimum Required Contribution

Under 40 ILCS 5/3, the statutory minimum required contribution is to be determined based upon the Projected Unit Credit actuarial funding method, where the unfunded liability is amortized such that 90% of the liability will be funded as of 2040. Under the statute, 90% of the unfunded liability is to be amortized as a level percentage of payroll over the period through 2040. The mandated funding method, the Projected **Unit Credit funding method**, requires the annual cost of the plan to be developed in two parts: that attributable to benefits allocated to the current year (the normal cost); and that allocated to benefits attributable to prior service (the accrued liability).

Funding Elements for 40 ILCS 5/3

	Present Value of Benefits as of 5/1/2016	Projected Unit Credit (PUC) Normal Cost as of 5/1/2016	PUC Actuarial Accrued Liability as of 5/1/2016
1. Active Officers			
a) Normal & Early Retirement	\$ 66,400,352	\$ 2,244,751	\$ 40,172,911
b) Vested Withdrawal	783,871	41,804	528,882
c) Pre-Retirement Death	2,513,016	105,133	1,612,701
d) Disability	<u>13,897,251</u>	<u>589,848</u>	<u>8,574,113</u>
e) Total Active Police Officers	\$ 83,594,490	\$ 2,981,536	\$ 50,888,607
2. Inactive Police Officers and Survivors:			
a) Normal Retirees	\$ 57,171,716		\$ 57,171,716
b) Widows (survivors)	6,436,287		6,436,287
c) Deferred Vested	108,889		108,889
d) Disabled	<u>17,636,527</u>		<u>17,636,527</u>
e) Total - Nonactive	\$ 81,353,419		\$ 81,353,419
3. Total – All	\$ 164,947,909		\$ 132,242,026

Minimum Statutory Contribution under 40 ILCS 5/3

Item	Amount
1. Annual Payroll	\$ 10,270,208
2. Normal Cost (net of employee/member contributions)	2,010,488
3. Employee Contributions (expected)	971,048
4. Funding Actuarial Liability	132,242,026
5. 90% of Funding Actuarial Liability	119,017,823
6. Actuarial Value of Assets (Exhibit 3)	62,960,955
7. Unfunded Actuarial Balance	56,056,868
8. Amortization of Unfunded Balance over 24 years as a level percentage of payroll	3,028,304
9. Interest on (2), (3) and (8)	390,640
10. Minimum statutory tax levy contribution per 40 ILCS 5/3 – (2) + (8) + (9)	\$5,429,432 (52.9%)

*() amount as a percent of payroll



Exhibit 5- Determination of the Actuarially Determined Contribution

The Tax Levy has been based upon the funding policy actuarially determined contribution, rather than the amount determined as the minimum under 40 ILCS 5/3. The funding policy contribution is developed below, based upon the Entry Age Normal Funding Method, with the unfunded accrued liability amortized as a level percentage of payroll amount over the 24 years through 2040. The contribution is then the sum of the Normal Cost (developed under the entry age method, but where the total normal cost is not less than 17.5%) plus the amortization payment.

Funding Elements for Actuarially Determined Contribution

	Present Value of Benefits as of 5/1/2016	Entry Age Normal Cost as of 5/1/2016	Entry Age Accrued Liability as of 5/1/2016
1. Active Officers			
a) Normal & Early Retirement	\$ 66,400,352	\$ 2,091,271	\$ 44,336,225
b) Vested Withdrawal	783,871	62,777	80,174
c) Pre-Retirement Death	2,513,016	118,813	1,236,896
d) Disability	<u>13,897,251</u>	<u>671,759</u>	<u>6,633,806</u>
e) Total Active Police Officers	\$ 83,594,490	\$ 2,944,620	\$ 52,287,101
2. Inactive Police Officers and Survivors:			
a) Normal Retirees	\$ 57,171,716		\$ 57,171,716
b) Widows (survivors)	6,436,287		6,436,287
c) Deferred Vested	108,889		108,889
d) Disabled	<u>17,636,527</u>		<u>17,636,527</u>
e) Total - Nonactive	\$ 81,353,419		\$ 81,353,419
3. Total – All	\$ 164,947,909		\$ 133,640,520

Actuarially Determined Contribution

Item	Amount
1. Normal Cost (net of employee/member contributions)	\$ 1,973,572
2. Employee Contributions (expected)	971,048
3. Funding Actuarial Liability	133,640,520
4. 90% of Funding Actuarial Liability	120,276,468
5. Actuarial Value of Assets (Exhibit 3)	62,960,955
6. Unfunded Actuarial Balance	57,315,513
7. Amortization of Unfunded Balance over 24 years as a level dollar amount	4,488,246
8. Interest on (1), (2) and (7)	483,136
9. Actuarially Determined Funding Policy Contribution for Tax Levy (1) + (7) + (8)	\$6,944,954 (67.6%)



Exhibit 6 – Summary of Participant Data as of May 1, 2016

Participant Data

Item	As of 5/1/2016		
	<u>Tier 1</u>	<u>Tier 2</u>	<u>Total</u>
Active Members			
Vested	80	0	80
Non-Vested	<u>15</u>	<u>20</u>	<u>35</u>
Total Actives	95	20	115
Terminated Members entitled to future benefits	3	4	7
Retired Members	67	0	67
Surviving Spouses	23	0	23
Minor Dependents	4	0	4
Disabled Participants	<u>26</u>	<u>0</u>	<u>26</u>
Total	218	24	242

AGE AND SERVICE DISTRIBUTION AS OF MAY 1, 2016

Active Employee Participants

Age Group	Service									Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	
Under 20										0
20 - 24	3									3
25 - 29	8									8
30 - 34	6	8	3							17
35 - 39	2	4	12	5						23
40 - 44		4	5	20						29
45 - 49			2	8	8					18
50 - 54				4	4	5				13
55 - 59				1	1	1				3
60 - 64						1				1
75 & Over										0
Total	19	16	22	38	13	7	0	0	0	115

Average Age: 41.0 years

Average Length of Service: 14.1 years



SECTION 4 - SUMMARY OF PRINCIPAL PLAN PROVISIONS

This summary provides a general description of the major eligibility and benefit provisions of the pension fund upon which this valuation has been based. It is not intended to be, nor should it be interpreted as, a complete statement of all provisions

Definitions

Tier 1 – For Firefighters first entering Article 3 prior to January 1, 2011

Tier 2 – For Firefighters first entering Article 3 after December 31, 2010

Firefighter (4-106): Any person employed in the municipality's fire service as a firefighter, fire engineer, marine engineer, fire pilot, bomb technician or scuba diver.

Creditable Service (4-108): Time served by a firefighter, excluding furloughs and leaves of absence in excess of 30 days, but including leaves of absence for illness or accident and periods of disability where no disability pension payments are received and also including up to 3 years during which disability payments have been received provided contributions are made.

Creditable Service (4-108): Time served by a firefighter, excluding furloughs and leaves of absence in excess of 30 days, but including leaves of absence for illness or accident and periods of disability where no disability pension payments are received and also including up to 3 years during which disability payments have been received provided contributions are made.

Creditable Service from other specified agencies is also included. Combined service credit option is available on a voluntary basis.

Pension (4-109)

Normal Pension Age

Tier 1 - Age 50 with 20 or more years of creditable service.

Tier 2 - Age 55 with 10 or more years of creditable service.

Normal Pension Amount

Tier 1 - 50% of the greater of the annual salary held in the year preceding retirement or the annual salary held on the last day of service, plus 2½% of such annual salary for service from 20 to 30 year (maximum 25%]).

Tier 2 - 2½% of Final Average salary for each year of service. Final Average Salary is the highest salary based on the highest consecutive 96 months of the final 120 months of service

Early Retirement at age 50 with 10 or more years of service but with a penalty of ½% for each month prior to age 55.

Annual Salary capped at \$106,800 increased yearly by the lesser of ½ of the Consumer Price Index- Urban

Minimum Monthly Benefit: \$1,000

Maximum Benefit Percentage: 75% of salary



Termination Pension Amount

Any firefighter who retires or is separated from service with at least 10, but less than 20 years of credited service, shall be entitled to a monthly pension commencing at age 60 equal to the monthly rate of compensation based on rank at separation multiplied by the applicable percentage below:

<u>Years of Credited Service</u>	<u>Applicable Percentage</u>
10	15.00%
11	17.6
12	20.4
13	23.4
14	26.6
15	30
16	33.6
17	37.4
18	41.4
19	45.6

Pension Increase Non-Disabled

Tier 1 - 3% increase of the original pension amount after attainment of age 55 for each year elapsed since retirement, followed by an additional 3% of the original pension amount on each January 1 thereafter. Effective July 1, 1993, 3% of the amount of pension payable at the time of the increase including increases previously granted, rather than 3% of the originally granted pension amount.

Tier 2 - The lesser of ½ of the Consumer Price Index- Urban (CPI-U) or 3% increase of the original pension amount after attainment of age 60, followed by an additional 3% of the original pension amount on each January 1 thereafter.

Disabled

3% increase of the original pension amount after attainment of age 60 for each year he or she received pension payments, followed by an additional 3% of the original pension amount in each January 1

Pension to Survivors (4-114)

Death Benefit

Tier 1 -54% of annual salary based on attained rank at date of separation of service to surviving spouse, plus 12% of such salary to dependent children under 18.

100% of annual salary if death occurs in the line of duty.

Greater of 100% of monthly retirement benefit or 54% of annual salary if completed 20 years of service or on disability retirement.

Tier 2 – 66 2/3% of pension amount to surviving spouse (or dependent children), subject to the following increase: the lesser of ½ of the Consumer Price Index- Urban (CPI-U) or 3% increase of the original pension amount after attainment of age 60, followed by an additional 3% of the original pension amount on each January 1 thereafter.

Minimum Survivor Pension

Annual step rate increases from \$1,030 to \$1,159.27 per month.



Disability Pension - Line of Duty (4-110)

Eligibility

Suspension or retirement from fire service due to sickness, accident or injury while on duty.

Pension

Greater of 65% of salary attached to rank at date of suspension or retirement and the retirement pension available. Minimum Benefit: Annual step rate increases from \$1,030 to \$1,159.27 per month.

Disability Pension - Not on Duty (4-111)

Eligibility

Suspension or retirement from fire service for any cause other than while on duty.

Pension

50% of salary attached to rank at date of suspension or retirement.

Disability Pension - Occupational Disease (4-110.1)

Eligibility

Suspension or retirement from service after 5 years of service from causes of heart disease, cancer, tuberculosis or other lung disease.

Pension

Greater of 65% of salary attached to rank at date of suspension or retirement and the retirement pension available. Minimum Benefit: Annual step rate increases from \$1,030 to \$1,159.27 per month.

Other Provisions

Refund (4-116)

At death with no survivors, contributions are returned to estate.

At termination with less than 20 years of service, contributions are refunded upon request.

Contributions by Firefighters (4-118.1)

9.455% of salary including longevity, but excluding overtime pay, holiday pay, bonus pay, merit pay or other cash benefit. Additional 1% of salary if combined service credit option is selected.



Actuarial Accrued Liability

See ***Entry Age Normal Cost Method*** and ***Projected Unit Credit Cost Method***.

Actuarial Assumptions

The economic and demographic predictions used to estimate the present value of the plan's future obligations. They include estimates of investment earnings, salary increases, mortality, withdrawal and other related items. The *Actuarial Assumptions* are used in connection with the *Actuarial Cost Method* to allocate plan costs over the working lifetimes of plan participants.

Actuarial Cost Method

The method used to allocate the projected obligations of the plan over the working lifetimes of the plan participants. Also referred to as an *Actuarial Funding Method*.

Actuarial Funding Method

See *Actuarial Cost Method*

Actuarial Gain (Loss)

The excess of the actual *Unfunded Actuarial Accrued Liability* over the expected *Unfunded Actuarial Accrued Liability* represents an *Actuarial Loss*. If the expected *Unfunded Actuarial Accrued Liability* is greater, an *Actuarial Gain* has occurred.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of *Actuarial Assumptions*.

Actuarial Value of Assets

The asset value derived by using the plan's *Asset Valuation Method*.

Asset Valuation Method

A valuation method designed to smooth random fluctuations in asset values. The objective underlying the use of an asset valuation method is to provide for the long-term stability of employer contributions.

Employee Retirement Income Security Act of 1974 (ERISA)

The primary federal legislative act establishing funding, participation, vesting, benefit accrual, reporting, and disclosure standards for pension and welfare plans.

Entry Age Normal Cost Method

One of the standard actuarial funding methods in which the *Present Value of Projected Plan Benefits* of each individual included in the *Actuarial Valuation* is allocated on a level basis over the earnings of the individual between entry age and assumed exit age(s). The portion of this *Actuarial Present Value* allocated to a valuation year is called the *Normal Cost*. The portion of this *Actuarial Present Value* not provided for at a valuation date by the *Actuarial Present Value* of future *Normal Costs* is called the



Normal Cost

The portion of the *Present Value of Projected Plan Benefits* that is allocated to a particular plan year by the *Actuarial Cost Method*. See *Entry Age Normal Cost Method* for a description of the Normal Cost under the *Entry Age Normal Cost Method*. See *Projected Unit Credit Cost Method* for a description of the Normal Cost under the *Projected Unit Credit Cost Method*.

Present Value of Future Normal Costs

The present value of future normal costs determined based on the *Actuarial Cost Method* for the plan. Under the *Entry Age Normal Cost Method*, this amount is equal to the excess of the *Present Value of Projected Plan Benefits* over the sum of the *Actuarial Value of Assets* and *Unfunded Actuarial Accrued*

Present Value of Projected Plan Benefits

The present value of future plan benefits reflecting projected credited service and salaries. The present value is determined based on the plan's actuarial assumptions.

Projected Unit Credit Cost Method

One of the standard actuarial funding methods in which the *Present Value of Projected Plan Benefits* of each individual included in the *Actuarial Valuation* is allocated by a consistent formula to valuation years. The *Actuarial Present Value* allocated to a valuation year is called the *Normal Cost*. The *Actuarial Present Value* of benefits allocated to all periods prior to a valuation year is called the *Actuarial Accrued Liability*.

Unfunded Actuarial Accrued Liability

The excess of the *Actuarial Accrued Liability* over the *Actuarial Value of Assets*.



SECTION 5 - SUMMARY OF ACTUARIAL ASSUMPTIONS AND COST METHODS

Nature of Actuarial Calculations

The results documented in this report are estimates based on data that may be imperfect and on assumptions about future events, some of which are mandated assumptions. Certain provisions may be approximated or deemed immaterial and therefore are not valued. Assumptions may be made about participant data or other factors. A range of results, different from those presented in this report could be considered reasonable. The numbers are not rounded, but this is for convenience and should not imply precisions, which is not inherent in actuarial calculations.

Actuarial Assumption Item	Annual Actuarial Valuation Statutory Minimum	Annual Actuarial Valuation Actuarially Determined Contribution																																																																																																
Interest	6.50% per annum	6.50% per annum																																																																																																
Mortality	RP2000 Mortality Table with Blue Collar Adjustments with mortality improvements projected to 2015, and 40% preretirement load	RP2000 Mortality Table with Blue Collar Adjustments with mortality improvements projected to 2015, and 40% preretirement load																																																																																																
Retirement	Rates of retirement for all ages are: <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Age</u></th> <th></th> <th style="text-align: left;"><u>Age</u></th> <th></th> </tr> </thead> <tbody> <tr><td>50</td><td>19.00%</td><td>61</td><td>36.00%</td></tr> <tr><td>51</td><td>12.00%</td><td>62</td><td>44.00%</td></tr> <tr><td>52</td><td>4.00%</td><td>63</td><td>52.00%</td></tr> <tr><td>53</td><td>6.00%</td><td>64</td><td>60.00%</td></tr> <tr><td>54</td><td>9.00%</td><td>65</td><td>100%</td></tr> <tr><td>55</td><td>12.00%</td><td>66</td><td>100%</td></tr> <tr><td>56</td><td>15.00%</td><td>67</td><td>100%</td></tr> <tr><td>57</td><td>19.00%</td><td>68</td><td>100%</td></tr> <tr><td>58</td><td>22.00%</td><td>69</td><td>100%</td></tr> <tr><td>59</td><td>25.00%</td><td>70</td><td>100%</td></tr> <tr><td>60</td><td>28.00%</td><td></td><td></td></tr> </tbody> </table>	<u>Age</u>		<u>Age</u>		50	19.00%	61	36.00%	51	12.00%	62	44.00%	52	4.00%	63	52.00%	53	6.00%	64	60.00%	54	9.00%	65	100%	55	12.00%	66	100%	56	15.00%	67	100%	57	19.00%	68	100%	58	22.00%	69	100%	59	25.00%	70	100%	60	28.00%			Rates of retirement for all ages are: <table style="margin-left: 40px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Age</u></th> <th></th> <th style="text-align: left;"><u>Age</u></th> <th></th> </tr> </thead> <tbody> <tr><td>50</td><td>19.00%</td><td>61</td><td>36.00%</td></tr> <tr><td>51</td><td>12.00%</td><td>62</td><td>44.00%</td></tr> <tr><td>52</td><td>4.00%</td><td>63</td><td>52.00%</td></tr> <tr><td>53</td><td>6.00%</td><td>64</td><td>60.00%</td></tr> <tr><td>54</td><td>9.00%</td><td>65</td><td>100%</td></tr> <tr><td>55</td><td>12.00%</td><td>66</td><td>100%</td></tr> <tr><td>56</td><td>15.00%</td><td>67</td><td>100%</td></tr> <tr><td>57</td><td>19.00%</td><td>68</td><td>100%</td></tr> <tr><td>58</td><td>22.00%</td><td>69</td><td>100%</td></tr> <tr><td>59</td><td>25.00%</td><td>70</td><td>100%</td></tr> <tr><td>60</td><td>28.00%</td><td></td><td></td></tr> </tbody> </table>	<u>Age</u>		<u>Age</u>		50	19.00%	61	36.00%	51	12.00%	62	44.00%	52	4.00%	63	52.00%	53	6.00%	64	60.00%	54	9.00%	65	100%	55	12.00%	66	100%	56	15.00%	67	100%	57	19.00%	68	100%	58	22.00%	69	100%	59	25.00%	70	100%	60	28.00%		
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Salary Increase	<p>Rates of salary increases are based upon age only. An additional 2.5% reflecting inflationary increases, was added in addition to the rates illustrated below.</p> <table border="1"> <thead> <tr> <th><u>Age</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>25</td> <td>4.86%</td> </tr> <tr> <td>40</td> <td>1.52%</td> </tr> <tr> <td>50</td> <td>1.18%</td> </tr> <tr> <td>55</td> <td>1.12%</td> </tr> </tbody> </table>	<u>Age</u>		25	4.86%	40	1.52%	50	1.18%	55	1.12%	<p>Rates of salary increases are based upon age only. An additional 2.5% reflecting inflationary increases, was added in addition to the rates illustrated below.</p> <table border="1"> <thead> <tr> <th><u>Age</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>25</td> <td>4.86%</td> </tr> <tr> <td>40</td> <td>1.52%</td> </tr> <tr> <td>50</td> <td>1.18%</td> </tr> <tr> <td>55</td> <td>1.12%</td> </tr> </tbody> </table>	<u>Age</u>		25	4.86%	40	1.52%	50	1.18%	55	1.12%
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Payroll Growth	Total payroll is assumed to increase at 4.00% per annum	Total payroll is assumed to increase at 4.00% per annum																				
Percentage Married	85% are married, females are assumed to be 3 years younger	85% are married, females are assumed to be 3 years younger																				
Asset Valuation Method	Assets are valued at fair market value and smoothed over five years, reflecting gains and losses at 20% per year.	Assets are valued at fair market value and smoothed over five years, reflecting gains and losses at 20% per year.																				
Actuarial Cost Methods	<p>Projected Unit Credit Cost Method</p> <p>This is the mandated actuarial method to be used in determining the statutory contribution requirements and under PA 096-1495. This method determines the present value of projected benefits and prorates the projected benefit by service to date to determine the accrued liability. Amounts attributable to past service are amortized as a level percentage of pay with the goal of reaching 90% of the accrued liability by 2040.</p>	<p>Entry Age Normal Cost Method</p> <p>This method projects benefits from entry age to retirement age and attributes costs over total service, as a level percentage of pay. Amounts attributable to past service have been amortized over 25 years on a closed basis as a level percentage of pay.</p>																				

