



Cavanaugh Macdonald
CONSULTING, LLC

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GASB Statement No. 67 Report

For the

**Montana Volunteer Firefighters' Compensation Act
Retirement System**

Prepared as of

June 30, 2018





Cavanaugh Macdonald

CONSULTING, LLC

The experience and dedication you deserve

August 31, 2018

Public Employees' Retirement Board
100 North Park, Suite 200
Helena, MT 59620-0139

Members of the Board:

Presented in this report is information to assist the Montana Volunteer Firefighters' Compensation Act Retirement System of the State of Montana (VFCA) in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statement No. 67. The information is presented for the period ending June 30, 2018.

The annual actuarial valuation used as a basis for much of the information presented in this report was performed as of June 30, 2017. The valuation was based upon data, furnished by the PERA staff, concerning active, inactive and retired members along with pertinent financial information.

To the best of our knowledge, this report is complete and accurate. The necessary calculations were performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries with experience in performing valuations for public retirement systems.

The calculations were prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board, and, in our opinion, meet the requirements of GASB 67.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the System, and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System. In addition, the calculations were completed in compliance with the laws governing the System. The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.



Board of Trustees

August 31, 2018

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

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Edward Macdonald', written in a cursive style.

Edward A. Macdonald, ASA, FCA, MAAA
President

A handwritten signature in blue ink, appearing to read 'Todd B. Green', written in a cursive style.

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

EAM/TBG:bvb



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REPORT OF THE ANNUAL GASB STATEMENT NO. 67

**REQUIRED INFORMATION FOR
VOLUNTEER FIREFIGHTERS' COMPENSATION ACT
OF THE STATE OF MONTANA**

PREPARED AS OF JUNE 30, 2018

BOARD SUMMARY

This report provides information required by the Volunteer Firefighters' Compensation Act (VFCA) in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 "Financial Reporting for Pension Plans." The information provided herein was prepared for the purpose of assisting VFCA to comply with the financial reporting and disclosure requirements of GASB No. 67 and is not applicable for purposes of funding the System. A calculation of the System's liability for purposes other than GASB No. 67 may produce significantly different results.

The Total Pension Liability (TPL), Fiduciary Net Position (FNP), Net Pension Liability (NPL) and certain sensitivity information shown in this report are based on an actuarial valuation performed as of June 30, 2017. The total pension liability as of the end of the plan year, June 30, 2018, was determined using standard roll forward procedures, which are detailed in Section II of this report.

The System's FNP is projected to cover all future benefit payments of current plan members. Therefore, the discount rate used to measure the TPL is the long-term expected rate of return on pension plan investments of 7.65%.

As of June 30, 2018, the TPL is \$46,396,146 and the FNP is \$38,729,625. The NPL, which is determined by subtracting the FNP from the TPL, is equal to \$7,666,521. Also included in this report is a sensitivity analysis of the NPL, which shows results using both a 1% increase in the discount rate and 1% decrease in the discount rate. A higher discount rate reduces the NPL while a lower discount increases the NPL.

Schedule A shows three tables of required supplementary information. The first table details the changes in the NPL for the year ending June 30, 2018, with a comparison to the prior four years. The second table shows the ratio of the FNP to the TPL and a ratio of the NPL to the covered-employee payroll for the same five-year period. The final Schedule A table shows a history of the schedule of employer contributions.

The table on the following page highlights information required by GASB No. 67 as of June 30, 2018.



REPORT OF THE ANNUAL GASB STATEMENT NO. 67

**REQUIRED INFORMATION FOR
VOLUNTEER FIREFIGHTERS' COMPENSATION ACT
OF THE STATE OF MONTANA**

PREPARED AS OF JUNE 30, 2018

BOARD SUMMARY

	2018
Valuation Date (VD):	June 30, 2017
Prior Measurement Date:	June 30, 2017
Measurement Date (MD):	June 30, 2018
Membership Data:	
Retirees and Beneficiaries	1,438
Inactive Members	824
Active Employees	<u>1,957</u>
Total	4,219
Discount Rate:	
Long-Term Expected Rate of Return	7.65%
Municipal Bond Index Rate at Prior Measurement Date	3.56%
Municipal Bond Index Rate at Measurement Date	3.89%
Fiscal Year in which Fiduciary Net Position is Projected to be Depleted	n/a
Discount Rate at Prior Measurement Date	7.65%
Discount Rate at Measurement Date	7.65%
Net Pension Liability:	
Total Pension Liability (TPL)	\$46,396,146
Fiduciary Net Position (FNP)	<u>38,729,625</u>
Net Pension Liability (NPL = TPL – FNP)	\$7,666,521
FNP as a percentage of TPL	83.48%



Section I - Introduction

**REPORT OF THE ANNUAL GASB STATEMENT NO. 67
REQUIRED INFORMATION FOR THE
MONTANA VOLUNTEER FIREFIGHTERS' COMPENSATION ACT RETIREMENT
SYSTEM OF THE STATE OF MONTANA
PREPARED AS OF JUNE 30, 2018**

This report was prepared as of June 30, 2018 to assist the Montana Volunteer Firefighters' Compensation Act Retirement System of the State of Montana in complying with Governmental Accounting Standards Board Statement No. 67 (GASB 67), "*Financial Reporting For Pension Plans*". Much of the material provided in this report is based on the data, assumptions and results of the annual actuarial valuation of the Montana Volunteer Firefighters' Compensation Act Retirement System of the State of Montana as of June 30, 2017. The results of that valuation were detailed in a report dated September 28, 2017.

GASB 67 basically divorces accounting and funding, creating disclosure and reporting requirements that may or may not be consistent with the basis used for funding the System.

GASB 67 requires the determination of the Total Pension Liability (TPL) utilizing the Entry Age Normal actuarial funding method. If, as is the case here, the valuation date at which the TPL is determined is before the Measurement Date, the TPL must be rolled forward to the Measurement Date. The Net Pension Liability (NPL) is then set equal to the TPL minus the System's Fiduciary Net Position (FNP) (the market values of assets) as of the Measurement Date. The benefit provisions recognized in the calculation of the TPL are summarized in Schedule B.

Among the assumptions needed for the liability calculation is a Discount Rate. To determine the Discount Rate, the FNP must be projected into the future for as long as there are anticipated benefits payable under the plan's provision applicable to the membership and beneficiaries of the System on the Measurement Date. If the FNP is projected to not be depleted at any point in the future, the long term expected rate of return on plan investments expected to be used to finance the benefit payments may be used as the Discount Rate.



Section I - Introduction

If, however, the FNP is projected to be depleted, the Discount Rate is determined as the single rate that will generate a present value of benefit payments equal to the sum of the present value determined by discounting all projected benefit payments through the date of depletion by the long term expected rate of return, and the present value determined by discounting those benefits after the date of depletion by a 20-year tax-exempt municipal bond (rating AA/Aa or higher) rate. The rate used, if necessary, for this purpose is the monthly average of the Bond Buyers General Obligation 20-year Municipal Bond Index Rate published weekly by The Bond Buyer (www.bondbuyer.com). The Municipal Bond Index Rate as of the measurement date is 3.89%.

The sections that follow provide the results of all the necessary calculations, presented in the order laid out in GASB 67 for note disclosure and Required Supplementary Information (RSI).



Section II – Financial Statement Notes

The material presented herein will follow the order as presented in GASB 67. Paragraph numbers are provided for ease of reference.

Paragraphs 30(a) (1)-(3): The information required is to be supplied by the Plan.

Paragraph 30(a) (4): The data required regarding the membership of the Montana Volunteer Firefighters' Compensation Act Retirement System were furnished by the System's staff. The following table summarizes the membership of the system as of June 30, 2017, the Valuation Date.

Membership

	Number
Inactive Members Or Their Beneficiaries Currently Receiving Benefits	1,438
Inactive Members Entitled To But Not Yet Receiving Benefits	824
Active Members	1,957
Total	4,219

Paragraphs 30(a)(5)-(6) and Paragraphs 30(b)-(f): The information required is to be supplied by the Plan.



Section II – Financial Statement Notes

Paragraphs 31(a) (1)-(4): The information is provided in the following table. As stated above, the NPL is equal to the TPL minus the FNP.

	Fiscal Year Ending
	June 30, 2018
Total Pension Liability	\$46,396,146
Fiduciary Net Position	<u>38,729,625</u>
Net Pension Liability	\$7,666,521
Ratio of Fiduciary Net Position to Total Pension Liability	83.48%

Paragraph 31(b): This paragraph requires information regarding the actuarial assumptions used to measure the TPL. The actuarial assumptions utilized in developing the TPL are outlined in Schedule B. The total pension liability was determined by an actuarial valuation as of June 30, 2017, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.75 percent
Salary increases	N/A
Investment rate of return	7.65 percent, net of pension plan investment expense, including inflation
Mortality	Healthy Mortality: RP 2000 Combined Employee and Annuitant Mortality Table projected to 2020 using Scale BB, set back one year for males Disabled Mortality: RP-2000 Combined Employee and Annuitant Mortality Table



Section II – Financial Statement Notes

Paragraph 31.b.(1)

- (a) **Discount rate:** The discount rate used to measure the total pension liability was 7.65%
- (b) **Projected cash flows:** The projection of cash flows used to determine the discount rate assumed the System will receive the contributions provided for in statute in the future.
- (c) **Long term rate of return:** The long-term expected rate of return on plan investments is reviewed regularly as part of experience studies prepared for the System. The results of the most recent experience study was presented in a report dated May 5, 2017. Several factors are considered in evaluating the long-term rate of return assumption, including long-term historical data, estimates inherent in current market data, and an analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of investment expense and inflation). Estimates of variability and correlations for each asset class, were developed by the System's investment consultant. These ranges were combined to develop the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and then adding expected inflation. The capital market assumptions developed by the investment consultant are often intended for use over a 10-year investment horizon and are not always useful in setting the long-term rate of return for funding pension plans which covers a longer timeframe. The long-term rate of return assumption is intended to be a long-term assumption (30 to 50 years) and is not expected to change absent a significant change in the asset allocation, a change in the inflation assumption, or a fundamental change in the market that alters expected returns in future years. The capital market assumptions provided by the investment consultant yielded a median real rate of return of 3.56%. The average long term capital market assumptions published in the *Survey of Capital Market Assumptions 2016 Edition* by Horizon Actuarial Service, LLC, yield a median real return of 5.53%. Our recommended assumption of 4.9% for the real return reflects granting each source some degree of credibility. Combined with the 2.75% inflation assumption, the resulting nominal return is 7.65%.
- (d) **Municipal bond rate:** The discount rate determination does not use a municipal bond rate.
- (e) **Periods of projected benefit payments:** Future benefit payments for all current plan members were projected through 2110.



Section II – Financial Statement Notes

(f) **Assumed Asset Allocation:** The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Broad US Equity	36.0%	4.55%
Broad Intl Equity	18.0%	6.35%
Private Equity	12.0%	7.75%
Intermediate Bonds	23.4%	1.00%
High Yield Bonds	2.6%	4.00%
Core Real Estate	4.0%	4.00%
Non-Core Real Estate	4.0%	4.00%

(g) **Sensitivity analysis:** This paragraph requires disclosure of the sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability of the System, calculated using the discount rate of 7.65 percent, as well as what the System’s net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower and 1-percentage-point higher than the current rate:

	1% Decrease 6.65%	Current Discount Rate 7.65%	1% Increase 8.65%
System’s net pension liability	\$12,207,487	\$7,666,521	\$3,820,778



Section II – Financial Statement Notes

Paragraph 31(c): June 30, 2017 is the actuarial valuation date upon which the TPL is based. An expected TPL is determined as of June 30, 2018 using standard roll forward techniques. The roll forward calculation adds the annual normal cost (also called the service cost), subtracts the actual benefit payments and refunds for the plan year and then applies the expected investment rate of return for the year. The table below summarizes the calculation.

TPL Roll Forward	(1) TPL Reported for Fiscal Year End 2017	(2) Development of TPL for Fiscal Year End 2018
(a) Interest Rate	7.65%	7.65%
(b) Valuation Date for Measurement	June 30, 2016	June 30, 2017
(c) TPL as of June 30, 2017	\$ 46,717,576	\$ 45,852,771
(d) Entry Age Normal Cost for the period July 1, 2017 - June 30, 2018	\$ 85,735	\$ 85,735
(e) Actual Benefit Payments and Refunds for the period July 1, 2017 - June 30, 2018	\$ 2,944,046	\$ 2,944,046
(f) TPL as of June 30, 2018 = [(c + d) * (1 + (a))] - [e * (1 + (a)/2)]	\$ 47,327,109	\$ 46,396,146
(g) Experience Actuarial (Gain) / Loss: = (2f) - (1f)		\$ (930,963)



Section III – Required Supplementary Information

There are several tables of Required Supplementary Information (RSI) that need to be included in the System’s financial statements:

Paragraphs 32(a)-(c): The required tables are provided in Schedule A.

Paragraph 32(d): The money-weighted rates of return required are to be supplied by the Plan.

Paragraph 34: In addition the following should be noted regarding the RSI:

Changes of benefit terms: The following changes were made to the plan provisions as identified:

2015:

Effective January 1, 2016, the monthly base benefit for current and future retirees has been increased from \$7.50 to \$8.75 for each year of credited service, up to 20 years. Credited service after 20 years of service is \$7.50 per year.

Allowable payments increased from \$300 to \$3,000, which includes stipends or per diem. Compensation is not included.

Changes of assumption: The following changes have been made to the actuarial assumptions and methods:

2017

1. The discount rate was lowered from 7.75% to 7.65%
2. The inflation rate was reduced from 3.00% to 2.75%
3. The non-disabled mortality and withdrawal assumptions were updated.



Section III – Required Supplementary Information

Method and assumptions used in calculations of actuarially determined contributions. The actuarially determined contribution rates are determined on an annual basis. The following actuarial methods and assumptions were used to determine contribution rates reported in that schedule:

Valuation Date	June 30, 2017
Timing	Actuarially determined contributions are calculated as of the valuation date payable in the fiscal year beginning immediately following the valuation date.
Actuarial cost method	Entry age Normal
Amortization method	Level dollar, open
Remaining amortization period	6 years
Asset valuation method	4-year smoothed market
Wage Inflation	N/A
Salary increase	N/A
Inflation	2.75 percent
Investment rate of return	7.65 percent, net of pension plan investment expense, including inflation
Mortality	Healthy Mortality: RP 2000 Combined Employee and Annuitant Mortality Table projected to 2020 using Scale BB, set back one year for males Disabled Mortality: RP-2000 Combined Employee and Annuitant Mortality Table



Schedule A – Required Supplementary Tables

**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
GASB 67 Paragraph 32(a)**

	2018	2017	2016	2015	2014
Total pension liability					
Service Cost	92,294	267,843	282,498	221,969	237,639
Interest	3,461,285	3,336,579	3,355,483	2,851,618	2,843,095
Benefit changes	0	0	0	6,173,245	0
Difference between expected and actual experience	(930,963)	(791,792)	(1,141,179)	(618,854)	0
Changes of assumptions	0	2,281,533	0	0	0
Benefit payments	(2,944,046)	(2,858,443)	(2,623,011)	(2,379,353)	(2,294,676)
Refunds of contributions	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Net change in total pension liability	(321,430)	2,235,720	(126,209)	6,248,625	786,058
Total pension liability - beginning	46,717,576	44,481,856	44,608,065	38,359,440	37,573,382
Total pension liability - ending (a)	46,396,146	46,717,576	44,481,856	44,608,065	38,359,440
Plan net position					
Contributions - employer	0	0	0	0	0
Contribution - non-employer	2,212,113	2,064,561	2,036,297	1,913,482	1,818,237
Contributions - member	0	0	0	0	0
Net investment income	3,126,746	3,836,835	622,331	1,479,954	4,815,491
Benefit payments	(2,944,046)	(2,858,443)	(2,623,011)	(2,379,353)	(2,294,676)
Administrative expense	(293,142)	(288,897)	(241,726)	(180,466)	(136,079)
Refunds of contributions	0	0	0	0	0
Other	<u>(2,478)</u>	<u>(6,897)</u>	<u>(14,436)</u>	<u>0</u>	<u>0</u>
Net change in plan net position	2,099,193	2,747,159	(220,545)	833,617	4,202,973
Plan net position - beginning	36,630,432	33,883,273	34,103,818	33,270,201	29,067,228
Plan net position - ending (b)	38,729,625	36,630,432	33,883,273	34,103,818	33,270,201
Net pension liability - ending (a) - (b)	7,666,521	10,087,144	10,598,583	10,504,247	5,089,239



Schedule A – Required Supplementary Tables

SCHEDULE OF THE NET PENSION LIABILITY GASB 67 Paragraph 32(b)

	2018	2017	2016	2015	2014
Total pension liability	46,396,146	46,717,576	44,481,856	44,608,065	38,359,440
Plan net position	<u>38,729,625</u>	<u>36,630,432</u>	<u>33,883,273</u>	<u>34,103,818</u>	<u>33,270,201</u>
Net pension liability	7,666,521	10,087,144	10,598,583	10,504,247	5,089,239
Ratio of plan net position to total pension liability	83.48%	78.41%	76.17%	76.45%	86.73%
Covered-employee payroll	N/A	N/A	N/A	N/A	N/A
Net pension liability as a percentage of covered-employee payroll	N/A	N/A	N/A	N/A	N/A



Schedule A – Required Supplementary Tables

SCHEDULE OF EMPLOYER CONTRIBUTIONS GASB 67 Paragraph 32(c)

	2018	2017	2016	2015	2014
Actuarially determined employer contribution	2,212,113	2,064,561	2,036,297	890,358	1,116,227
Actual employer	0	0	0	0	0
Non-Employer	2,212,113	2,064,561	2,036,297	1,913,482	1,818,237
Annual contribution deficiency (excess)	0	0	0	(1,023,124)	(702,010)
Covered-employee payroll	N/A	N/A	N/A	N/A	N/A
Actual contributions as a percentage of covered-employee payroll	N/A	N/A	N/A	N/A	N/A



Schedule B – Plan Provisions

Type of plan	<ul style="list-style-type: none">• Multiple-employer cost-sharing
Membership eligibility	<ul style="list-style-type: none">• Unpaid volunteer firefighters serving with qualified volunteer fire companies in unincorporated areas throughout the state.
Member contributions	<ul style="list-style-type: none">• No member contributions
State contributions	<ul style="list-style-type: none">• 5% of certain fire insurance premium taxes collected and passed through the general fund
Credit for service	<p>To receive a year of credit for service, a volunteer firefighter must:</p> <ul style="list-style-type: none">• Serve with a single fire company for an entire fiscal year, and• Receive a minimum of 30 hours of training.• Fractional years are not credited.
Normal retirement eligibility and benefit formula	<ul style="list-style-type: none">• Age 55 with 20 years of credit for service, or• Age 60 with 10 years of credit for service• \$8.75 per month x year of credit for service up to 20 years• \$7.50 per month x year of credit for service after 20 years• For VFCA members retiring prior to July 1, 2011, maximum credited service is 30 years• VFCA members retiring on or after July 1, 2011, will receive \$7.50 per month for each additional year of credited service after 30 years in each year that the trust is actuarially sound and the amortization period is 20 years or less; otherwise benefits for the year will only be paid on credited service up to 30 years.
Duty-related disability retirement eligibility and benefit formula	<ul style="list-style-type: none">• Any current member on a fire company's roster• The greater of:<ul style="list-style-type: none">a. \$87.50 per month, orb. (\$8.75 per month x year of credit for service up to 20 years) + (\$7.50 per month x year of credit for service after 20 years up to 30 years of credit for service)
Survivor's eligibility and benefit formula	<ul style="list-style-type: none">• 10 years of credit for service or a retired member• A monthly survivor benefit to the surviving spouse (or equally to dependent children if there is no surviving spouse or after a surviving spouse dies, for as long as they remain dependent children) equal to the full benefit otherwise payable to the member.• Survivor benefits terminate when benefits have been paid for a total of 40 months, including any benefits paid to the retired member prior to death.



Schedule B – Plan Provisions

Changes since last valuation • None



Schedule C – Actuarial Assumptions and Methods

The assumptions and methods utilized in the valuation were developed in the six-year experience study for the period ending June 30, 2016.

Tables C-2 through C-4 give rates of decrement for service retirement, disablement, mortality, and other terminations of employment.

Actuarial Cost Method

The actuarial valuation was prepared using the entry age actuarial cost method. Under this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit. The portion of this actuarial present value allocated to a valuation year is called the normal cost. The normal cost was first calculated for each individual member. The normal cost rate is the total of the individual normal costs, divided by the total pay rate.

The portion of this actuarial present value not provided for at a valuation date by the sum of (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the UAAL. The UAAL is amortized as a level percentage of the projected salaries of present and future members of the System.

Records and Data

The data used in the valuation consists of financial information, records of age, sex, service, salary, contribution rates, and account balances of contributing members and records of age, sex, and amount of benefit for retired members and beneficiaries. All of the data has been supplied by the System and was accepted for valuation purposes without audit.

Replacement of Terminated Members

The ages at entry and distribution by sex of future members are assumed to average the same as those of the present members they replace. If the number of active members should increase, it is further assumed that the average entry age of the larger group will be the same, from an actuarial standpoint, as that of the present group. Under these assumptions, the normal cost rates for active members will not vary with the termination of present members.

Administrative and Investment Expenses

The investment expenses of the System are assumed to be funded by investment earnings in excess of 7.65% per year.

Administrative expenses are assumed to equal \$89,298 in fiscal year end 2018.

Valuation of Assets

Market value of assets.



Schedule C – Actuarial Assumptions and Methods

Investment Earnings

The annual rate of investment earnings of the assets of the System is assumed to be 7.65% per year net of investment expenses, compounded annually.

Service Retirement

Table C-2 shows the annual assumed rates of retirement among members eligible for service retirement. Separate rates are used when a member is eligible for reduced benefits, for the first year a member is eligible for full benefits, and for the years following the first year a member is eligible for full benefits.

Disablement

There are no rates of disablement used in this valuation.

Mortality

The mortality rates used in this valuation are illustrated in Table C-3. A written description of each table used is included in Table C-1.

Other Terminations of Employment

The rates of assumed future withdrawal from active service for reasons other than death, disability or retirement are shown for representative ages in Table C-4.

Probability of Marriage and Dependent Children

If death occurs in active status, all members are assumed to have an eligible spouse with no dependent children. Female spouses are assumed to be three years younger than males.



Schedule C – Actuarial Assumptions and Methods

Table C-1

Summary of Valuation Assumptions

I. Economic assumptions	
A. Investment return	7.65%
B. Price Inflation Assumption	2.75%
C. Growth in membership	0.00%
II. Demographic assumptions	
A. Retirement	Table C-2
D. Mortality among contributing members, service retired members, and beneficiaries. The tables include margins for mortality improvement which is expected to occur in the future. For Males and Females: RP 2000 Combined Employee and Annuitant Mortality Table projected to 2020 using Scale BB, set back one year for males.	Table C-3
E. Mortality among disabled members For Males and Females: RP 2000 Combined Employee and Annuitant Mortality Table.	Table C-3
F. Other terminations of employment	Table C-4



Schedule C – Actuarial Assumptions and Methods

Table C-2

**Retirement
Annual Rates**

Age	10 to 19 Years of Service	20 or More Years of Service
Less than 55	0.0%	0.0%
55	0.0	40.0
56	0.0	40.0
57	0.0	40.0
58	0.0	40.0
59	0.0	40.0
60	20.0	40.0
61	20.0	40.0
62	20.0	40.0
63	20.0	40.0
64	20.0	40.0
65	20.0	40.0
66	20.0	40.0
67	20.0	40.0
68	20.0	40.0
69	20.0	40.0
70 & Over	100.0	100.0

Vested terminations are assumed to retire at their earliest unreduced eligibility



Schedule C – Actuarial Assumptions and Methods

Table C-3
Mortality
Annual Rates

Age	Contributing Members, Service Retired Members and Beneficiaries		Disabled Members	
	Men	Women	Men	Women
25	0.0354%	0.0195%	0.0376%	0.0207%
30	0.0388	0.0249	0.0444	0.0264
35	0.0661	0.0447	0.0773	0.0475
40	0.0961	0.0665	0.1079	0.0706
45	0.1316	0.1058	0.1508	0.1124
50	0.1879	0.1578	0.2138	0.1676
55	0.3010	0.2458	0.3624	0.2717
60	0.5271	0.4135	0.6747	0.5055
65	0.9041	0.7624	1.2737	0.9706
70	1.4636	1.3151	2.2206	1.6742
75	2.5057	2.2077	3.7834	2.8106
80	4.2816	3.6037	6.4368	4.5879
85	7.3750	6.0833	11.0757	7.7446
90	13.0721	10.5549	18.3408	13.1682
95	21.7835	17.2452	26.7491	19.4509



Schedule C – Actuarial Assumptions and Methods

Table C-4

**Other Terminations of Employment
Among Members Not Eligible to Retire
Annual Rates**

Years of Service	All Members
0	30.0%
1	30.0
2	30.0
3	30.0
4	30.0
5	30.00
6	25.00
7	25.00
8	21.00
9	17.00
10-26	13.00
26 & Over	10.00



Schedule D – Glossary of Terms

Actuarial Present Value of Projected Benefit Payments

Projected benefit payments discounted to reflect the expected effects of the time value (present value) of money and the probabilities of payment.

Actuarial Valuation

The determination, as of a point in time (the actuarial valuation date), of the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions performed in conformity with Actuarial Standards of Practice, unless otherwise specified by the GASB.

Actuarial Valuation Date

The date as of which an actuarial valuation is performed.

Actuarially Determined Contribution

A target or recommended contribution to a defined benefit pension plan for the reporting period, determined in conformity with Actuarial Standards of Practice and based on the most recent measurement date available when the contribution for the reporting period was adopted.

Cost-Sharing Multiple Employer Defined Benefit Pension Plan (Cost-Sharing Pension Plan)

A multiple-employer defined benefit pension plan in which the pension obligation to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.

Covered Employee Payroll

The payroll on which contributions to a pension plan are based.



Schedule D – Glossary of Terms

Discount Rate

The single rate of return that, when applied to all projected benefit payments, results in an actuarial present value of projected benefit payments equal to the total of the following:

1. The actuarial present value of benefit payments projected to be made in future periods in which (a) the amount of the pension plan's fiduciary net position is projected (under the requirements of Statement 67) to be greater than the benefit payments that are projected to be made in the period and (b) pension plan assets up to that point are expected to be invested using a strategy to achieve the long-term expected rate of return, calculated using the long-term expected rate of return on pension plan investments.
2. The actuarial present value of projected benefit payments not included in (1), calculated using the municipal bond rate.

Entry Age Actuarial Cost Method

A method under which the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings or service 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 the actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is called the actuarial accrued liability.

Money-Weighted Rate of Return

A method of calculating period-by-period returns on pension plan investments that adjust for the changing amounts actually invested. For purpose of Statement 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

Net Pension Liability

The liability of employers and non-employer contributing entities to plan members for benefits provided through a defined benefit pension plan. It is calculated by subtracting the plan's fiduciary net position from the plan's total pension liability.

Non-Employer Contributing Entity

Entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of Statement 67, plan members are not considered non-employer contributing entities.



Schedule D – Glossary of Terms

Plan Members

Individuals that are covered under the terms of a pension plan. Plan Members generally included (1) employees in active service (active plan members) and (2) terminated employees who have accumulated benefits but are not yet receiving them and retirees or their beneficiaries currently receiving benefits (inactive plan members).

Projected Benefit Payments

All benefits estimated to be payable through the pension plan to current active and inactive plan members as a result of their past service and their expected future service.

Real Rate of Return

The rate of return on an investment after adjustment to eliminate inflation

Service Cost

The portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

Single-Employer Defined Benefit Pension Plan (Single-Employer Pension Plan)

A defined benefit pension plan that is used to provide pensions to employees of only one employer.

Total Pension Liability

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service in conformity with the requirements of Statement 67.