

DRAFT



VILLAGE OF CARPENTERSVILLE
CARPENTERSVILLE FIREFIGHTERS PENSION FUND

Actuarial Valuation Report
For the Year
Beginning January 1, 2016
And Ending December 31, 2016

Timothy W. Sharpe, Actuary, Geneva, IL (630) 262-0600



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INTRODUCTION

Fire-sworn personnel of the Village of Carpentersville are covered by the Firefighters Pension Plan that is a defined-benefit, single-employer pension plan. The purpose of this report is to provide to the Intended Users of this report, specifically the Intended Users are the Village Officials, the Pension Board and the Village and Pension Board auditors, the reporting requirements of the Illinois Pension Code, the GASB Statements No. 25 & 27 and 67 & 68 financial information and related actuarial information for the year stated in this report. This report is not intended for distribution or usage to or by anyone who is not an Intended User and should not be used for any other purpose.

The valuation results reported herein are based on the employee data, plan provisions and the financial data provided by the Village. The actuary has relied on this information and does not assume responsibility for the accuracy or completeness of this information. I hereby certify that to the best of my knowledge this report is complete and accurate and fairly presents the actuarial position of the Fund in accordance with generally accepted actuarial principles and procedures. In my opinion, the assumptions used are reasonably related to the experience of the Plan and to reasonable expectations. A reasonable request for supplementary information not included in this report should be directed to the undersigned actuary.

The actuary cautions the Intended Users of the possibility of uncertainty or risks in any of the results in this report.

I, Timothy W. Sharpe, am an Enrolled Actuary and a member of the American Academy of Actuaries, and I meet the Qualifications Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Timothy W. Sharpe, EA, MAAA
Enrolled Actuary No. 14-4384

Date



SUMMARY OF RESULTS

There was a change with respect to Actuarial Assumptions from the prior year to reflect revised expectations with respect to mortality rates. The mortality rates have been changed to the RP 2014 Mortality Table (BCHA) projected to 2016 using improvement scale MP-2015.

The Retirement Plans Experience Committee of the Society of Actuaries (RPEC) presented an update to Mortality Improvement Scale MP-2014, which was released in October 2014. This updated scale was created using two additional years of historical data and the same RPEC 2014 model that was used to produce Scale MP-2014. For clarity, the updated mortality improvement scale is called MP-2015.

Within the MP-2014 report, RPEC indicated an intention to publish updated improvement scales at least triennially. Subsequent to the development of Scale MP-2014, the Social Security Administration (SSA) released two years of additional mortality data. To reflect this latest available data, RPEC is now publishing this 2015 update and intends on providing future annual updates to the model as soon as practicable following the public release of updated data upon which the model is constructed.

The Village fiscal year has been changed to the calendar year. The prior fiscal year was the 8-month period from May 1, 2015 through December 31, 2015. The Tax Levy was adjusted accordingly (prorated for 8 months).

There were no changes with respect to Plan Provisions or Actuarial Methods from the prior year.

Based on the plan sponsor's funding policy and future expected plan contributions and funded status, the plan is to be expected to produce adequate assets to make benefit payments when they are due.

The benefit payment default risk or the financial health of the plan sponsor was not deemed to be material.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law.

Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements.



SUMMARY OF RESULTS (Continued)

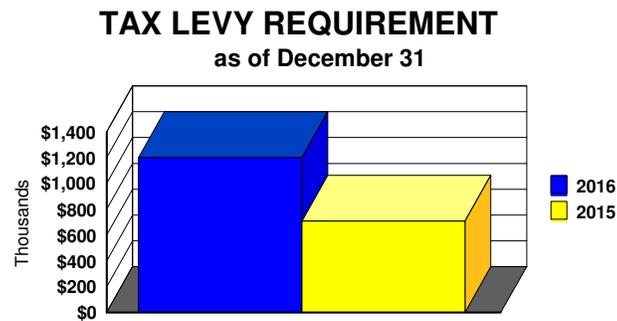
There were no unexpected changes with respect to the participants included in this actuarial valuation (2 new members, 1 termination, 0 retirements, 0 incidents of disability, annual payroll increase 4.9%, average salary increase 2.6%).

There were no unexpected changes with respect to the Fund's investments from the prior year (annual investment return -1.49%).

The Village's Tax Levy Requirement has increased from \$722,056 (8-month period) last year to \$1,213,828 this year (68.1%, 9.6% on 12-month basis). The increase in the Tax Levy is due to the increase in salaries, the investment return was less than assumed and the changes to the assumptions. The Percent Funded has decreased from 65.7% last year to 65.1% this year.

SUMMARY OF RESULTS (Continued)

	For Year Ending December 31	
	<u>2016</u>	<u>2015</u>
Tax Levy Requirement	\$ 1,213,828	\$ 722,056
	as of January 1	
	<u>2016</u>	<u>5/1/2015</u>
Village Normal Cost	637,438	593,588
Anticipated Employee Contributions	304,017	289,882
Accrued Liability	30,180,980	28,231,535
Actuarial Value of Assets	19,638,263	18,562,011
Unfunded Accrued Liability/(Surplus)	10,542,717	9,669,524
Amortization of Unfunded Accrued Liability/(Surplus)	496,981	441,206
Percent Funded	65.1%	65.7%
Annual Payroll	\$ 3,215,405	\$ 3,065,913



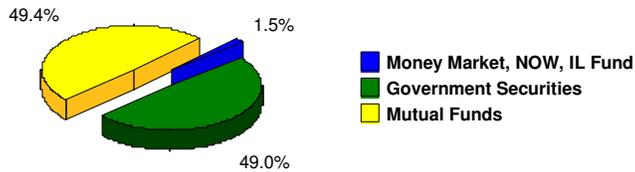
ACTUARIAL VALUATION OF ASSETS

		as of January 1	
		<u>2016</u>	<u>5/1/2015</u>
Money Market, NOW, IL Fund	\$	284,425	\$ 208,835
Government Securities		9,160,919	8,884,100
Mutual Funds		9,238,922	9,158,589
Interest Receivable		54,607	65,931
Miscellaneous Receivable/(Payable)		<u>(17,895)</u>	<u>(6,706)</u>
Market Value of Assets		<u>18,720,979</u>	<u>18,310,749</u>
Actuarial Value of Assets	\$	19,638,263	18,562,011

FYE 2013-2015 (Gain)/Loss: (\$121,422); \$218,332; \$20,156; \$1,052,676

SUMMARY OF ASSETS

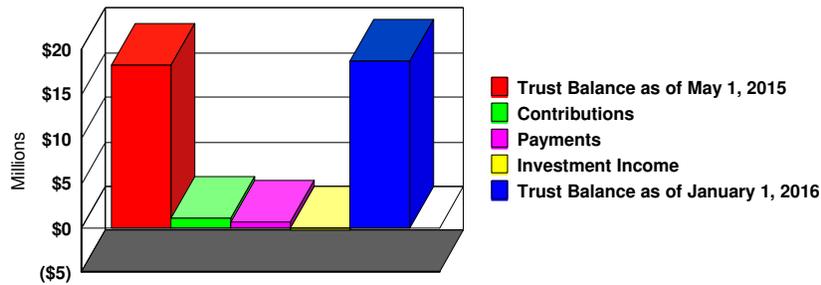
As Of January 1, 2016



ASSET CHANGES DURING PRIOR YEAR

Trust Balance as of May 1, 2015		\$	18,310,749
Contributions			
Village	1,010,757		
Employee	<u>212,253</u>		
Total			1,223,009
Payments			
Benefit Payments	607,615		
Expenses	<u>20,862</u>		
Total			628,477
Investment Income			<u>(184,302)</u>
Trust Balance as of January 1, 2016		\$	<u>18,720,979</u>
Approximate Annual Rate of Return			-1.49%

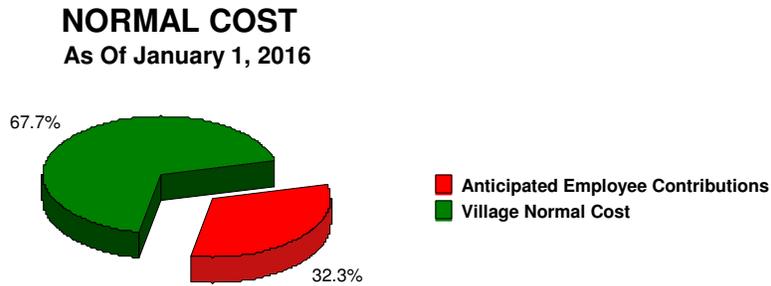
ASSET CHANGES DURING PRIOR YEAR



NORMAL COST

The Normal Cost is the actuarial present value of the portion of the projected benefits that are expected to accrue during the year based upon the actuarial valuation method and actuarial assumptions employed in the valuation.

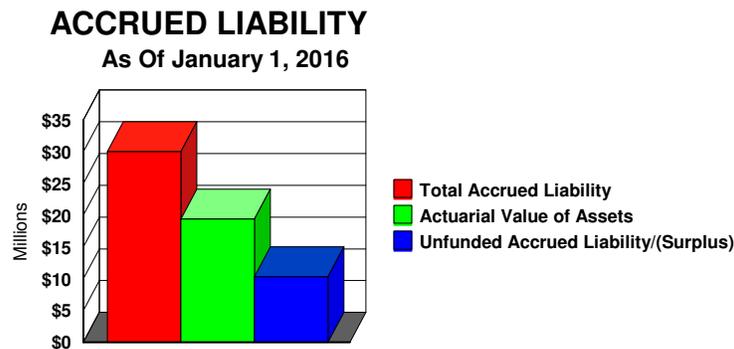
		as of January 1	
		<u>2016</u>	<u>5/1/2015</u>
Total Normal Cost	\$	941,455	\$ 883,470
Anticipated Employee Contributions		<u>304,017</u>	<u>289,882</u>
Village Normal Cost		<u>637,438</u>	<u>593,588</u>
Normal Cost Payroll	\$	3,215,405	\$ 3,065,913
Village Normal Cost Rate		19.82%	19.36%
Total Normal Cost Rate		29.28%	28.82%



ACCRUED LIABILITY

The Accrued Liability is the actuarial present value of the portion of the projected benefits that has been accrued as of the valuation date based upon the actuarial valuation method and actuarial assumptions employed in the valuation. The Unfunded Accrued Liability is the excess of the Accrued Liability over the Actuarial Value of Assets.

	as of January 1	
Accrued Liability	<u>2016</u>	<u>5/1/2015</u>
Active Employees	\$ 15,962,875	\$ 14,062,205
Children Annuities	7,977	8,562
Disability Annuities	4,848,569	4,736,004
Retirement Annuities	8,985,538	8,612,738
Surviving Spouse Annuities	311,144	300,217
Terminated Vested Annuities	<u>64,877</u>	<u>511,809</u>
Total Annuities	14,218,105	14,169,330
Total Accrued Liability	30,180,980	28,231,535
Actuarial Value of Assets	<u>19,638,263</u>	<u>18,562,011</u>
Unfunded Accrued Liability/(Surplus)	\$ <u>10,542,717</u>	\$ <u>9,669,524</u>
Percent Funded	65.1%	65.7%



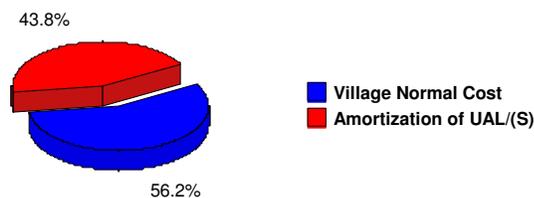
TAX LEVY REQUIREMENT

The Public Act 096-1495 Tax Levy Requirement is determined as the annual contribution necessary to fund the normal cost, plus the amount to amortize the excess (if any) of ninety percent (90%) of the accrued liability over the actuarial value of assets as a level percentage of payroll over a thirty (30) year period which commenced in 2011, plus an adjustment for interest. The 100% amortization amount is equal to the amount to amortize the unfunded accrued liability as a level percentage of payroll over a thirty (30) year period which commenced in 2011.

	For Year Ending December 31	
	<u>2016</u>	<u>2015¹</u>
Village Normal Cost as of Beginning of Year	\$ 637,438	\$ 395,725
Amortization of Unfunded Accrued Liability/(Surplus)	496,981	294,137
Interest for One Year	<u>79,409</u>	<u>32,193</u>
Tax Levy Requirement as of End of Year	\$ <u>1,213,828</u>	\$ <u>722,056</u>
 Public Act 096-1495 Tax Levy Requirement		
1) Normal Cost (PUC)	726,940	405,174
2) Accrued Liability (PUC)	28,170,703	26,495,077
3) Amortization Payment	269,421	160,721
4) Interest for One Year	69,745	26,409
5) PA 096-1495 Tax Levy Requirement (1 + 3 + 4)	\$ 1,066,106	592,303

¹ Prorated to reflect 8-month fiscal year.

TAX LEVY REQUIREMENT For Fiscal Year Ending December 31, 2016





SUMMARY OF PLAN PARTICIPANTS

The actuarial valuation of the Plan is based upon the employee data furnished by the Village. The information provided for Active participants included:

- Name
- Sex
- Date of Birth
- Date of Hire
- Compensation
- Employee Contributions

The information provided for Inactive participants included:

- Name
- Sex
- Date of Birth
- Date of Pension Commencement
- Monthly Pension Benefit
- Form of Payment

Membership	<u>2016</u>	<u>2016</u>	<u>2015</u>	<u>2015</u>
Current Employees				
Vested	21		19	
Nonvested	<u>16</u>		<u>17</u>	
Total	<u>37</u>		<u>36</u>	
Inactive Participants		<u>Annual Benefits</u>		<u>Annual Benefits</u>
Children	6 \$	1,721	6 \$	1,721
Disabled Employees	6	272,944	6	272,944
Retired Employees	9	605,127	9	605,127
Surviving Spouses	1	30,056	1	30,056
Terminated Vesteds	<u>3</u>	<u>23,635</u>	<u>3</u>	<u>23,635</u>
Total	<u>25</u>	<u>933,483</u>	<u>25</u>	<u>933,483</u>
Annual Payroll	\$	3,215,405	\$	3,065,913

SUMMARY OF PLAN PARTICIPANTS (Continued)

Age and Service Distribution

Service Age	0-4	5-9	10-14	15-19	20-24	25-29	30+	Total	Salary
20-24									
25-29	4							4	65,188
30-34		3						3	83,007
35-39		7	6	1				14	84,466
40-44		2	2	3				7	91,684
45-49			1	2		1		4	92,209
50-54			1		1	1		3	108,956
55-59				1				1	92,804
60+				1				1	92,804
Total	<u>4</u>	<u>12</u>	<u>10</u>	<u>8</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>37</u>	<u>86,903</u>
Salary	65,188	82,236	87,900	96,117	124,821	97,530			

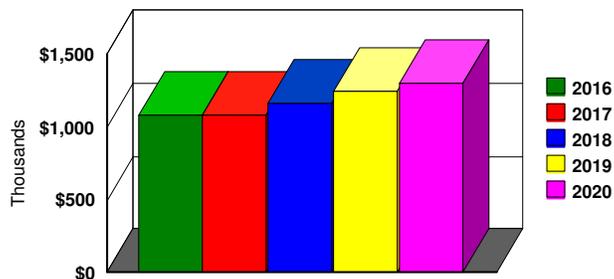
Average Age: 39.7 Average Service: 11.2 Average Future Service: 12.8

DURATION (years) Active Members: 20.1 Retired Members: 12.7 All Members: 16.6

PROJECTED PENSION PAYMENTS

<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>
\$1,083,774	\$1,089,494	\$1,167,758	\$1,244,834	\$1,303,363

PROJECTED PENSION PAYMENTS
2016-2020





SUMMARY OF PLAN PROVISIONS

The Plan Provisions have not been changed from the prior year.

The Village of Carpentersville Firefighters Pension Fund was created and is administered as prescribed by "Article 4. Firefighters' Pension Fund - Municipalities 500,000 and Under" of the Illinois Pension Code (Illinois Compiled Statutes, 1992, Chapter 40). A brief summary of the plan provisions is provided below.

Employees attaining the age of (50) or more with (20) or more years of creditable service are entitled to receive an annual retirement benefit of one-half of the salary attached to the rank held on the last day of service. The pension shall be increased by (1/12) of (2.5%) of such monthly salary for each additional month of service over (20) years up to (30) years, to a maximum of (75%) of such monthly salary.

Employees with at least (10) years but less than (20) years of credited service may retire at or after age (60) and receive a reduced benefit ranging from (15%) of final salary for (10) years of service to (45.6%) for 19 years of service.

Surviving spouses receive (100%) of final salary for fatalities resulting from an act of duty, or otherwise the greater of (54%) of final salary or the monthly retirement pension that the deceased firefighter was receiving at the time of death. Surviving children receive (12%) of final salary. The maximum family survivor benefit is (75%) of final salary.

Employees disabled in the line of duty receive (65%) of final salary.

The monthly pension of a covered employee who retired with (20) or more years of service after January 1, 1977, shall be increased annually, following the first anniversary date of retirement and be paid upon reaching the age of at least (55) years, by (3%) of the amount of the pension payable at the time of the increase.

Employees are required to contribute (9.455%) of their base salary to the Firefighters' Pension Plan. If an employee leaves covered employment with less than twenty (20) years of service, accumulated employee contributions may be refunded without accumulated interest.

For Employees hired after January 1, 2011, the annual retirement benefit is (2.5%) of final average salary for each year of service up to (30) years, to a maximum of (75%) of such salary, the Normal Retirement age is attainment of age 55 and completion of 10 years of service; Early Retirement age is attainment of age 50, completion of 10 years of service and the Early Retirement Factor is 6% per year; the Employee's Accrued Benefit is based on the Employee's final 8-year average salary not to exceed \$106,800 (as indexed); Cost-of-living adjustments are simple increases (not compounded) of the lesser of 3% or 50% of CPI beginning the later of the anniversary date and age 60; Surviving Spouse's Benefits are 66 2/3% of the Employee's benefit at the time of death.

ACTUARIAL METHODS

The Actuarial Methods employed for this valuation are as follows:

Projected Unit Credit Cost Method (for years beginning on or after 2011 for PA 096-1495)

Under the Projected Unit Credit Cost Method, the Normal Cost is the present value of the projected benefit (including projected salary increases) earned during the year.

The Accrued Liability is the present value of the projected benefit (including projected salary increases) earned as of the actuarial valuation date. The Unfunded Accrued Liability is the excess of the Accrued Liability over the plan's assets. Experience gains or losses adjust the Unfunded Accrued Liability.

Entry Age Normal Cost Method

Under the Entry Age Normal Cost Method the Normal Cost for each participant is computed as the level percentage of pay which, if paid from the earliest age the participant is eligible to enter the plan until retirement or termination, will accumulate with interest to sufficiently fund all benefits under the plan. The Normal Cost for the plan is determined as the greater of a) the sum of the Normal Costs for all active participants, and b) 17.5% of the total payroll of all active participants.

The Accrued Liability is the theoretical amount that would have accumulated had annual contributions equal to the Normal Cost been paid. The Unfunded Accrued Liability is the excess of the Accrued Liability over the plan's assets. Experience gains or losses adjust the Unfunded Accrued Liability.



ACTUARIAL ASSUMPTIONS

The Actuarial Assumptions used for determining the Tax Levy Requirement and GASB Statements No. 25 & 27 and 67 & 68 Disclosure Information are the same (except where noted) and have been changed from the prior year (discussion on page 4). The methods and assumptions disclosed in this report may reflect statutory requirements and may reflect the responsibility of the Principal and its advisors. Unless specifically noted otherwise, each economic and demographic assumption was selected in accordance with Actuarial Standards of Practice 27 and 35 and may reflect the views and advice of advisors to the Principal. In the event a method or assumption conflicts with the actuary's professional judgment, the method or assumption is identified in this report. The Actuarial Assumptions employed for this valuation are as follows:

Valuation Date	January 1, 2016
Asset Valuation Method	5-year Average Market Value (PA 096-1495)
Investment Return	7.00% net of investment expenses.
Salary Scale	5.50%
Mortality	RP 2014 Mortality Table (BCHA) projected to 2016 using improvement scale MP-2015.
Withdrawal	Based on studies of the Fund and the Department of Insurance, Sample Rates below
Disability	Based on studies of the Fund and the Department of Insurance, Sample Rates below
Retirement	Based on studies of the Fund and the Department of Insurance, Sample Rates below (100% by age 70)
Marital Status	80% Married, Female spouses 3 years younger



ACTUARIAL ASSUMPTIONS (Continued)

Sample Annual Rates Per 100 Participants

<u>Age</u>	<u>Withdrawal</u>	<u>Disability</u>	<u>Retirement</u>
20	9.00	0.10	
25	5.00	0.10	
30	2.50	0.20	
35	2.00	0.35	
40	1.00	0.50	
45	1.00	0.65	
50	1.00	1.00	14.00
55	1.00	1.50	20.00
60	1.00	3.00	25.00
65	1.00	4.25	50.00
70			100.00



GASB STATEMENTS NO. 25 & 27 DISCLOSURE INFORMATION

The Governmental Accounting Standards Board (GASB) issued Statements No. 25 & 27 that established generally accepted accounting principles for the annual financial statements for defined benefit pension plans. The required information is as follows:

Membership in the plan consisted of the following as of:

	<u>December 31, 2015</u>	<u>April 30, 2015</u>
Retirees and beneficiaries receiving benefits	22	22
Terminated plan members entitled to but not yet receiving benefits	3	3
Active vested plan members	21	19
Active nonvested plan members	<u>16</u>	<u>17</u>
Total	<u>62</u>	<u>61</u>
Number of participating employers	1	1

SCHEDULE OF FUNDING PROGRESS

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) -Entry Age (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a)/c)
04/30/14	17,042,719	24,413,583	7,370,864	69.8%	3,031,982	243.1%
04/30/15	18,310,749	28,231,535	9,920,786	64.9%	3,065,913	323.6%
12/31/15	18,720,979	30,180,980	11,460,001	62.0%	3,215,405	356.4%



GASB STATEMENTS NO. 25 & 27 DISCLOSURE INFORMATION (Continued)

ANNUAL PENSION COST AND NET PENSION OBLIGATION

	<u>December 31, 2015</u>	<u>April 30, 2015</u>
Annual required contribution	1,010,754	925,347
Interest on net pension obligation	158,088	135,683
Adjustment to annual required contribution	<u>(104,513)</u>	<u>(86,952)</u>
Annual pension cost	1,064,329	974,078
Contributions made	<u>1,010,757</u>	<u>654,009</u>
Increase (decrease) in net pension obligation	53,572	320,069
Net pension obligation beginning of year	<u>2,258,404</u>	<u>1,938,335</u>
Net pension obligation end of year	<u>2,311,976</u>	<u>2,258,404</u>

THREE-YEAR TREND INFORMATION

Fiscal Year <u>Ending</u>	Annual Pension Cost (APC) <u>Cost (APC)</u>	Percentage of APC <u>Contributed</u>	Net Pension Obligation <u>Obligation</u>
04/30/14	882,195	58.9%	1,938,335
04/30/15	974,078	67.1%	2,258,404
12/31/15	1,064,329	95.0%	2,311,976



GASB STATEMENTS NO. 25 & 27 DISCLOSURE INFORMATION (Continued)

FUNDING POLICY AND ANNUAL PENSION COST

Contribution rates:

Village	31.435%	21.332%
Plan members	9.455%	Same

Annual pension cost	1,064,329	974,078
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Contributions made	1,010,757	654,009
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Actuarial valuation date	12/31/2015	04/30/2015
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Actuarial cost method	Entry age	Same
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Amortization period	Level percentage of pay, closed	Same
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Remaining amortization period	25 years	26 years
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Asset valuation method	Market	Same
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Actuarial assumptions:

Investment rate of return*	7.00%	Same
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Projected salary increases*	5.50%	Same
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*Includes inflation at	2.50%	Same
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Cost-of-living adjustments	Tier 1: 3.00% per year, compounded Tier 2: 2.00% per year, simple	Same
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STATEMENTS NO. 67 & 68 DISCLOSURE INFORMATION

Plan Membership	December 31, 2015
Inactive plan members or beneficiaries currently receiving benefits	22
Inactive plan members entitled to but not yet receiving benefits	3
Active plan members	<u>37</u>
Total	<u>62</u>

Net Pension Liability of the Village	
Total pension liability	30,180,980
Plan fiduciary net position	18,720,979
Village's net pension liability	11,460,001
Plan fiduciary net position as a percentage of the total pension liability	62.03%

Actuarial Assumptions	
Inflation	2.50%
Salary increases	5.50%
Investment rate of return	7.00% net of expenses

The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rate and that Village contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the Net Pension Liability to Changes in the Discount Rate			
	1% Decrease	Current Discount Rate	1% Increase
	6.00%	7.00%	8.00%
Net Pension Liability	16,144,665	11,460,001	7,641,247



STATEMENTS NO. 67 & 68 DISCLOSURE INFORMATION (continued)

Schedule of Changes in the Village's Net Pension Liability and Related Ratios

	December 31, 2015
Total Pension Liability	
Service cost	630,209
Interest	1,303,294
Changes of benefit terms	0
Differences between expected and actual experience	(661,772)
Changes of assumptions	1,285,329
Benefit payments, including refunds of member contributions	607,615
Net change in total pension liability	1,949,445
Total pension liability - beginning	28,231,535
Total pension liability - ending	30,180,980
Plan Fiduciary Net Position	
Contributions - employer	1,010,757
Contributions - member	212,253
Net investment income	(184,302)
Benefit payments, including refunds of member contributions	607,615
Administrative expense	20,862
Other	0
Net change in plan fiduciary net position	410,229
Plan fiduciary net position - beginning	18,310,749
Plan fiduciary net position - ending	18,720,979
Village's net pension liability	11,460,001
Plan fiduciary net position as a percentage of the total pension liability	62.03%
Covered-employee payroll	3,215,405
Village's net pension liability as a percentage of covered-employee payroll	356.41%



STATEMENTS NO. 67 & 68 DISCLOSURE INFORMATION (continued)

Schedule of Village Contributions

	December 31, 2015
Actuarially determined contribution	1,010,754
Contributions in relation to the actuarially determined contribution	1,010,757
Contribution deficiency (Excess)	(3)
Covered-employee payroll	3,215,405
Contributions as a percentage of covered-employee payroll	31.43%

Notes to schedule

Valuation date December 31, 2015

Methods and assumptions used to determine contribution rates:

Actuarial cost method	Entry Age Normal
Amortization method	Level Percentage of Pay
Remaining amortization period	25 years
Asset valuation method	Market Value
Inflation	2.50%
Salary increases	5.50%
Investment rate of return	7.00%
Retirement age	50-70
Mortality	RP 2014 projected to 2016
Other	

Mortality rates were based on the RP 2014 Mortality Table (BCHA) projected to 2016 using improvement scale MP-2015. The other non-economic actuarial assumptions used in the December 31, 2015 valuation were based on the results of an actuarial experience study conducted by the Illinois Department of Insurance dated September 26, 2012.