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Actuarial Valuation  
as of May 1, 2016



**STERLING FIREFIGHTERS'  
PENSION FUND**

Utilizing Data as of April 30, 2016  
For the Contribution Year May 1, 2016 to April 30, 2017

***LAUTERBACH & AMEN, LLP***

# Actuarial Valuation – Funding Recommendation

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## Lauterbach & Amen, LLP

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CERTIFIED PUBLIC ACCOUNTANTS

### STERLING FIREFIGHTERS' PENSION FUND

**Contribution Year Ending: April 30, 2017**

Actuarial Valuation Date: May 1, 2016

Utilizing Data as of April 30, 2016

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***LAUTERBACH & AMEN, LLP***



# TABLE OF CONTENTS

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<b>ACTUARIAL CERTIFICATION</b> .....	<b>1</b>
<b>MANAGEMENT SUMMARY</b> .....	<b>2</b>
Contribution Recommendation .....	3
Funded Status.....	3
Management Summary – Comments and Analysis .....	4
Actuarial Contribution Recommendation - Reconciliation .....	7
<b>VALUATION OF FUND ASSETS</b> .....	<b>8</b>
Market Value of Assets.....	9
Market Value of Assets (Gain)/Loss.....	10
Development of the Actuarial Value of Assets .....	11
(Gain)/Loss on the Actuarial Value of Assets .....	11
Historical Asset Performance.....	12
<b>RECOMMENDED CONTRIBUTION DETAIL</b> .....	<b>13</b>
Actuarial Accrued Liability.....	14
Funded Status.....	14
Development of the Employer Normal Cost.....	15
Normal Cost as a Percentage of Expected Payroll .....	15
Contribution Recommendation .....	15
Actuarial Methods – Recommended Contribution.....	16
<b>ILLINOIS STATUTORY MINIMUM CONTRIBUTION</b> .....	<b>17</b>
Statutory Minimum Contribution.....	18
Funded Status – Statutory Minimum.....	18
Actuarial Methods – Illinois Statutory Minimum Contribution .....	20
<b>ACTUARIAL VALUATION DATA</b> .....	<b>21</b>
Active Employees .....	22
Inactive Employees.....	22
Summary Of Benefit Payments.....	22
<b>ACTUARIAL FUNDING POLICIES</b> .....	<b>23</b>
Actuarial Cost Method.....	24
Financing Unfunded Actuarial Accrued Liability .....	24
Actuarial Value of Assets .....	24
<b>ACTUARIAL ASSUMPTIONS</b> .....	<b>25</b>
Nature of Actuarial Calculations.....	26
Actuarial Assumptions in the Valuation Process .....	26
Actuarial Assumptions Utilized .....	27
<b>SUMMARY OF PRINCIPAL PLAN PROVISIONS</b> .....	<b>29</b>
Establishment of the Fund.....	30

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## TABLE OF CONTENTS

---

Administration .....	30
Employee Contributions .....	30
Normal Retirement Pension Benefit .....	30
Normal Retirement Pension Benefit - Continued.....	31
Early Retirement Pension Benefit .....	31
Pension to Survivors .....	32
Termination Benefit.....	33
Disability Benefit.....	34
<b>GLOSSARY OF TERMS .....</b>	<b>35</b>
Glossary of Terms.....	36

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## ACTUARIAL CERTIFICATION

This report documents the results of the Actuarial valuation of the Sterling Firefighters' Pension Fund. The purpose is to report the actuarial contribution requirement for the contribution year May 1, 2016 to April 30, 2017. Determinations for purposes other than meeting the employer's actuarial contribution requirements may be significantly different from the results herein.

The results in this report are based on information and data submitted by the Sterling Firefighters' Pension Fund including studies performed by prior actuaries. We did not prepare the actuarial valuations for the years prior to May 1, 2016. Those Valuations were prepared by other actuaries whose reports have been furnished to us, and our disclosures are based upon those reports. An audit of the information was not performed, but high-level reviews were performed for general reasonableness, as appropriate, based on the purpose of the valuation. The accuracy of the results is dependent upon the accuracy and completeness of the underlying information. The results of the actuarial valuation and these supplemental disclosures rely on the information provided.

The valuation results summarized in this report involve actuarial calculations that require assumptions about future events. The Sterling Firefighters' Pension Fund selected certain assumptions, while others were the result of guidance and/or judgment. We believe that the assumptions used in this valuation are reasonable and appropriate for the purposes for which they have been used.

To the best of our knowledge, all calculations are in accordance with the applicable funding requirements, and the procedures followed and presentation of results conform to generally accepted actuarial principles and practices. The undersigned of Lauterbach & Amen, LLP, with actuarial credentials, meets the Qualification Standards of the American Academy of Actuaries to render this Actuarial Opinion. There is no relationship between the Sterling Firefighters' Pension Fund and Lauterbach & Amen, LLP that impairs our objectivity.

The information contained in this report was prepared for the use of the Sterling Firefighters' Pension Fund and the City of Sterling, Illinois in connection with our actuarial valuation. It is not intended or necessarily suitable for other purposes. It is intended to be used in its entirety to avoid misrepresentations.

Respectfully Submitted,  
LAUTERBACH & AMEN, LLP

Todd A. Schroeder, EA





## MANAGEMENT SUMMARY

Contribution Recommendation  
Funded Status  
Management Summary

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## MANAGEMENT SUMMARY

### CONTRIBUTION RECOMMENDATION

	Prior Valuation*	Current Valuation
Contribution Requirement	\$974,055	\$1,132,888
Expected Payroll	\$1,078,587	\$1,143,462
Contribution Requirement as a Percent of Expected Payroll	90.31%	99.08%

*Recommended  
Contribution  
has Increased  
\$158,833 from  
Prior Year.*

### FUNDED STATUS

	Prior Valuation*	Current Valuation
Normal Cost	\$267,801	\$277,986
Market Value of Assets	\$12,165,347	\$11,444,700
Actuarial Value of Assets	\$11,990,373	\$12,014,719
Actuarial Accrued Liability	\$21,191,021	\$25,446,534
Unfunded Actuarial Accrued Liability	\$9,200,648	\$13,431,815
Percent Funded		
Actuarial Value of Assets	56.58%	47.22%
Market Value of Assets	57.41%	44.98%

*Funded  
Percentage has  
Decreased  
9.36 on an  
Actuarial  
Value of Assets  
Basis.*

\* Prior Actuarial Valuation was completed by Tepfer Consulting Group, Ltd.



## MANAGEMENT SUMMARY

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### MANAGEMENT SUMMARY – COMMENTS AND ANALYSIS

#### Contribution Results

The contribution recommendation is based on the funding policies and procedures that are outlined in the “Actuarial Funding Policies” section of this report.

The State of Illinois statutes for pension funds contain parameters that should be used to determine the minimum amount of contribution to a public pension fund. Those parameters and the resulting minimum contribution can be found in the “Illinois Statutory Minimum Contribution” section of this report.

#### Defined Benefit Plan Risks

##### *Asset Growth*

Pension funding involves preparing plan assets to pay benefits for the members when they retire. During their working careers, assets need to build with contributions and investment earnings, and then the pension fund distributes assets during retirement. Based on the fund’s current mix of employees and funded status, the fund should be experiencing positive asset growth on average if requested contributions are made and expected investment earnings come in. In the current year the fund asset growth was negative by approximately \$721,000.

Asset growth is important long-term. Long-term cash flow out of the pension fund is primarily benefit payments. Expenses make up a smaller portion. The fund should monitor the impact of expected benefit payments and the impact on asset growth in the future. In the next 5 years, benefits payments are anticipated to increase 15-20%, or approximately \$268,000. In the next 10 years, the expected increase in benefit payments is 35-40%, or approximately \$483,000.

##### *Unfunded Liability:*

Unfunded liability represents dollars we expect to be in the pension fund already for the fund members based on funding policy. To the extent dollars are not in the pension fund the fund is losing investment returns on those dollars going forward. Payments to unfunded liability pay for the lost investment earnings, as well as the outstanding unfunded amount. If payment is not made, the unfunded liability will grow.

In the early 1990s, many pension funds in Illinois adopted an increasing payment to handle unfunded liability due to a change in legislation. The initial payments decreased, and payments were anticipated to increase annually after that. In many situations, payments early on may be less than the interest on unfunded liability, which means unfunded liability is expected to *increase* even if contributions are at the recommended level.



## MANAGEMENT SUMMARY

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The current contribution recommendation includes a payment to unfunded liability that is approximately \$72,000 greater than interest on the unfunded liability. All else being equal and contributions being made, unfunded liability would still be expected to decrease. The employer and the fund should anticipate currently that improvement in the funded percent will be mitigated in the short-term. The employer and the fund should understand this impact as we progress forward to manage expectations.

### *Actuarial Value of Assets:*

The pension fund smooths asset returns that vary from expectations over a five-year period. The intention over time is that asset returns for purposes of funding recommendations are a combination of several years. The impact is intended to smooth out the volatility of contribution recommendations over time, but not necessarily increase or decrease the level of contributions over the long-term.

When asset returns are smoothed, there are always gains or losses on the Market Value of Assets that are going to be deferred for current funding purposes, and recognized in future years. Currently, the pension fund is deferring approximately \$570,000 in losses on the Market Value of Assets. These are asset losses that will be recognized in upcoming periods, independent of the future performance of the Market Value of Assets.

### Plan Assets

The results in this report are based on the Assets held in the pension fund. Assets consist of funds held for investment and for benefit payments as of the Valuation Date. In addition, Assets may be adjusted for other events representing dollars that are reasonably expected to be paid out from the pension fund or deposited into the pension fund after the Actuarial Valuation Date as well.

The current fund Assets are Unaudited. As of the date of this report, the audit of the fund assets is not complete, not available, or has not been provided.

The current fund Assets are based on the year-end financials as prepared by the pension fund accountant. The year-end financials represent a full accrual version of the fiduciary fund as of the end of the fiscal year, prepared in preparation for the audit. The changes to the fund cash balance as of the fiscal year-end are non-cash items that can include accrued interest, due/unpaid expenses, prepaids and other adjustments.

*The Plan  
Assets Used in  
this Report  
are  
Unaudited.*

The actuarial value of assets under the funding policy is equal to the fair market value of assets, with unexpected gains and losses smoothed over 5 years. More detail on the Actuarial Value of Assets can be found in the funding policy section of the report.



## MANAGEMENT SUMMARY

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### Demographic Data

Demographic factors can change from year to year within a pension fund. Changes in this category include hiring new employees, employees retiring or becoming disabled, retirees passing away, and other changes. Demographic changes can cause an actuarial gain (contribution that is less than expected compared to the prior year) or an actuarial loss (contribution that is greater than expected compared to the prior year).

Demographic gains and losses occur when the assumptions over the one-year period for employee changes do not meet our long-term expectation. For example, if no employees become disabled during the year, we would expect a liability gain. If more employees become disabled than anticipated last year, we would expect a liability loss. Generally, we expect short-term fluctuations in demographic experience to create 1%-3% gains or losses in any given year, but to balance out in the long-term.

In the current report, the key demographic changes were as follows:

*New hires:* The fund added 1 new active member in the current year through hiring. When a new member is admitted to the pension fund, the employer contribution will increase to reflect the new member. The increase in the recommended contribution in the current year for new fund members is approximately \$5,600.

*Retirement:* There was 1 member of the fund who retired during the year. When a fund member retires, the normal cost will decrease. Any change in the actuarial liability will be considered when determining the amount to pay towards unfunded liability each year. The decrease in the recommended contribution in the current year due to the retirement experience is approximately \$7,500.

*Salary Increases:* Salary increases were greater than anticipated in the current year. Most active members received an increase of 4.00% or greater. This caused an increase in the recommended contribution in the current year of approximately \$1,700.

### Assumption Changes

We performed a comprehensive study of Firefighter pension funds in the State of Illinois. We reviewed the results of the study in addition to the experience in the current fund. The actuarial assumptions were changed in the current year. The changes were made to better reflect the future anticipated experience in the fund. See the table on the following page for the impact of these changes.

### Funding Policy Changes

The funding policy was changed from the prior year. The method of payment towards the unfunded liability has been changed from level dollar payments to level percent of payroll payments, and the remaining amortization years have been reduced from 24 to 20. The new funding policy represents a better fit for the goals of pension funding for all stakeholders. See the table on the following page for the impact of these changes.



## *MANAGEMENT SUMMARY*

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### **ACTUARIAL CONTRIBUTION RECOMMENDATION - RECONCILIATION**

Actuarial liability is expected to increase each year for both interest for the year and as active employees earn additional service years towards retirement. Similarly, actuarial liability is expected to decrease when the fund pays benefits to inactive employees.

Contributions are expected to increase as expected pay increases under the funding policy for the Fund.

Other increases or decreases in actuarial liability (key changes noted below) will increase or decrease the amount of unfunded liability in the plan. To the extent unfunded liability increases or decreases unexpectedly, the contribution towards unfunded liability will also change unexpectedly.

	<u>Actuarial Liability</u>	<u>Contribution Recommendation</u>
Salary Increase Less than Expected	(4,136)	1,695
Demographic Changes	80,947	(1,909)
Assumption Changes	3,330,651	229,270
Funding Policy Changes	-	(175,235)
Asset Return Less than Expected *	-	12,013
Contributions Less than Expected	-	21,809
Total Actuarial Experience	<u>\$ 3,407,462</u>	<u>\$ 87,643</u>

\*The impact on contribution due to asset performance is based on the Actuarial Value of Assets.

Key demographic changes were discussed in the prior section.





## VALUATION OF FUND ASSETS

Market Value of Assets  
Actuarial Value of Assets

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## *VALUATION OF FUND ASSETS*

### MARKET VALUE OF ASSETS

#### Statement of Assets

	Prior Valuation	Current Valuation
Money Market	\$ 211,480	\$ 320,897
Fixed Income	4,491,085	4,551,039
Stock Equities	2,136,103	2,118,505
Mutual Funds	5,303,382	4,426,716
Receivables (Net of Payables)	23,296	27,542
Net Assets Available for Pensions	<u>\$ 12,165,347</u>	<u>\$ 11,444,700</u>

*The Total Value of Assets has Decreased \$720,647 from Prior Valuation.*

#### Statement of Changes in Assets

Total Market Value - Prior Valuation	\$ 12,165,347
Plus - Employer Contributions	689,721
Plus - Employee Contributions	104,793
Plus - Return on Investments	(135,565)
Less - Benefit and Related Payments	(1,360,388)
Less - Other Expenses	<u>(19,207)</u>
Total Market Value - Current Valuation	<u>\$ 11,444,700</u>

*The Return on Investment on the Market Value of Assets for the Fund was Approximately (1.3%) Net of Administrative Expenses.*

The return on investments shown has been determined as the Return on Assets from the statement of changes in assets, as a percent of the average of the beginning and ending Market Value of Assets. Return on Investment is net of the Other Expenses as shown. The Return on Investments has been excluded from the Total Market Value of Assets at the end of the year for this calculation.



## VALUATION OF FUND ASSETS

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### MARKET VALUE OF ASSETS (GAIN)/LOSS

#### Current Year (Gain)/Loss on Market Value of Assets

Total Market Value - Prior Valuation	\$ 12,165,347
Contributions	794,514
Benefit Payments	(1,360,388)
Expected Return on Investments	<u>772,357</u>
Expected Total Market Value - Current Valuation	12,371,829
Actual Total Market Value - Current Valuation	<u>11,444,700</u>
Current Market Value (Gain)/Loss	<u>\$ 927,129</u>
Expected Return on Investments	\$ 772,357
Actual Return on Investments (Net of Expenses)	<u>(154,773)</u>
Current Market Value (Gain)/Loss	<u>\$ 927,129</u>

*The Return on  
the Market  
Value of Assets  
was Lower than  
Expected Over  
the Most Recent  
Year.*

The (Gain)/Loss on the Market Value of Assets has been determined based on expected returns at the actuarial rate.



## VALUATION OF FUND ASSETS

### DEVELOPMENT OF THE ACTUARIAL VALUE OF ASSETS

Total Market Value - Current Valuation		\$ 11,444,700
Adjustment for Prior (Gains)/Losses		
	<u>Full Amount</u>	
First Preceding Year	\$ 927,129	741,703
Second Preceding Year	(36,776)	(22,066)
Third Preceding Year	(306,366)	(122,546)
Fourth Preceding Year	(135,358)	(27,072)
Total Deferred (Gain)/Loss		<u>570,019</u>
Initial Actuarial Value of Assets - Current Valuation		12,014,719
Less Contributions for the Current Year and Interest		-
Less Adjustment for the Corridor		-
		<u>                    </u>
Actuarial Value of Assets - Current Valuation		<u>\$ 12,014,719</u>

*The Actuarial Value of Assets is Equal to the Fair Market Value of Assets with Unanticipated Gains/Losses Recognized over 5 Years. The Actuarial Value of Assets is Currently 105% of the Market Value.*

### (GAIN)/LOSS ON THE ACTUARIAL VALUE OF ASSETS

Total Actuarial Value - Prior Valuation		\$ 11,990,373
Plus - Employer Contributions		689,721
Plus - Employee Contributions		104,793
Plus - Return on Investments		609,428
Less - Benefit and Related Payments		(1,360,388)
Less - Other Expenses		<u>(19,207)</u>
Total Actuarial Value - Current Valuation		<u>\$ 12,014,719</u>

*The Return on Investment on the Actuarial Value of Assets for the Fund was Approximately 5.0% Net of Administrative Expenses.*

The Actuarial Value of Assets incorporates portions of gains and losses over multiple years.



## VALUATION OF FUND ASSETS

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### HISTORICAL ASSET PERFORMANCE

The chart below shows the historical rates of return on plan assets for both Market Value of Assets and Actuarial Value of Assets.

	<u>Market Value</u>	<u>Actuarial Value</u>
First Preceding Year	-1.3%	5.0%

The returns on assets shown above were calculated based on the annual return on investment for the year, as a percentage of the average value of the assets for the year.

For purposes of determining the average value of assets during the year, the ending market value of assets has been adjusted to net out to the portion related to the investment returns themselves. All other cash flows are included.

For purposes of determining the annual return on investment we have adjusted the figures shown on the preceding pages. The figures shown on the preceding pages are net of investment expenses. We have made an additional adjustment to net out administrative expenses. Netting out administrative expenses allows us to capture returns for the year that can be used to make benefit payments as part of the ongoing actuarial process.

The adjustment we make is for actuarial reporting purposes only. By netting out administrative expenses and capturing return dollars that are available to pay benefits, it provides us a comparison to the estimated rate of return on assets, but does not provide a figure that would be consistent with the return rates that are determined by other parties. Therefore, this calculated rate of return should not be used to analyze investment performance of the Fund or the performance of the investment professionals.





## RECOMMENDED CONTRIBUTION DETAIL

Actuarial Accrued Liability  
Funded Status  
Development of the Normal Cost  
Recommended Contribution  
Actuarial Methods – Recommended Contribution

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## *RECOMMENDED CONTRIBUTION DETAIL*

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### ACTUARIAL ACCRUED LIABILITY

	Current Valuation
Active Employees	\$ 4,470,574
Inactive Employees	
Terminated Employees - Vested	-
Retired Employees	19,025,468
Disabled Employees	1,401,570
Other Beneficiaries	548,922
Total Inactive Employees	<u>20,975,960</u>
Total Actuarial Accrued Liability	<u>\$ 25,446,534</u>

*The Total Actuarial Liability has Increased from Prior Valuation (See Management Summary).*

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### FUNDED STATUS

	Current Valuation
Total Actuarial Accrued Liability	\$ 25,446,534
Total Actuarial Value of Assets	<u>12,014,719</u>
Unfunded Actuarial Accrued Liability	<u>\$ 13,431,815</u>
Total Market Value of Assets	<u>\$ 11,444,700</u>
Percent Funded	
Actuarial Value of Assets	<u>47.22%</u>
Market Value of Assets	<u>44.98%</u>

*Funded Percentage as of the Valuation Date is Subject to Volatility on Assets and Liability in the Short-Term.*



## *RECOMMENDED CONTRIBUTION DETAIL*

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### DEVELOPMENT OF THE EMPLOYER NORMAL COST

	<u>Current Valuation</u>
Total Normal Cost	\$ 277,986
Estimated Employee Contributions	<u>(108,114)</u>
Employer Normal Cost	<u>\$ 169,872</u>

*At a 100%  
Funding Level,  
the Normal Cost  
Contribution is  
Still Required.*

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### NORMAL COST AS A PERCENTAGE OF EXPECTED PAYROLL

	<u>Current Valuation</u>
Expected Payroll	<u>\$ 1,143,462</u>
Employee Normal Cost Rate	<u>9.455%</u>
Employer Normal Cost Rate	<u>14.86%</u>
Total Normal Cost Rate	<u>24.31%</u>

*Ideally the  
Employer  
Normal Cost  
Rate will Remain  
Stable.*

---

### CONTRIBUTION RECOMMENDATION

	<u>Current Valuation</u>
Employer Normal Cost*	\$ 187,941
Amortization of Unfunded Accrued Liability/(Surplus)	<u>944,947</u>
Funding Requirement	<u>\$ 1,132,888</u>

*The  
Recommended  
Contribution has  
Increased from  
Prior Valuation  
(See Management  
Summary).*

\*Employer Normal Cost Contribution includes interest through the end of the year.



## *RECOMMENDED CONTRIBUTION DETAIL*

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### ACTUARIAL METHODS – RECOMMENDED CONTRIBUTION

Actuarial Valuation Date	May 1, 2016
Data Collection Date	April 30, 2016
Actuarial Cost Method	Entry Age Normal (Level % of Pay)
Amortization Method	Level % Pay (Closed)
Amortization Target	100% Funded over 20 Years
Asset Valuation Method	5-Year Smoothed Market Value

The contribution and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost methods described. The actuarial cost and amortization method allocates the projected obligations of the plan over the working lifetimes of the plan participants.

The recommended contribution amount shown in this report is based on the methods summarized above. The Actuarial Funding Policies section of the report will include a more detail description of the funding methods being used.

The Actuarial Funding Methods are meant to provide a systematic process for determining contributions on an annual basis. The methods do not impact the expectation of future benefit payments. The methods only impact the way dollars are contributed towards future benefit payments.

Different Actuarial Funding Methods may achieve funding goals with differing levels of success. Certain methods are more efficient and more stable on an annual basis.





# ILLINOIS STATUTORY MINIMUM CONTRIBUTION

Minimum Contribution  
Methods and Assumptions

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## *ILLINOIS STATUTORY MINIMUM CONTRIBUTION*

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### STATUTORY MINIMUM CONTRIBUTION

	<u>Minimum Contribution</u>
Contribution Requirement	\$764,245
Expected Payroll	\$1,143,462
Contribution Requirement as a Percent of Expected Payroll	66.84%

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### FUNDED STATUS – STATUTORY MINIMUM

	<u>Minimum Contribution</u>
Normal Cost	\$267,036
Market Value of Assets	\$11,444,700
Actuarial Value of Assets	\$12,014,719
Actuarial Accrued Liability	\$23,896,834
Unfunded Actuarial Accrued Liability	\$11,882,115
Percent Funded	
Actuarial Value of Assets	50.28%
Market Value of Assets	47.89%

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## *ILLINOIS STATUTORY MINIMUM CONTRIBUTION*

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The Statutory Minimum Contribution is based on funding methods and funding parameters in the Illinois statutes for pension funding. The resulting contribution is lower than the recommended contribution for the current plan year. The lower contribution amount is not recommended because it represents a deferral of contributions when compared to the recommended contribution method.

Actuarial Funding methods for pensions are best applied to provide a balance between the long-term goals of a variety of stakeholders:

1. Beneficiaries – the fund participants are interested in benefit security and having the dollars there to pay benefits when retired.
2. Employers – cost control and cost stability over the long-term
3. Taxpayers – paying for the services they are receiving from active employees

The Statutory Minimum Contribution methods are not intended to provide a better system in any of the above categories long-term. The parameters are not recommended for a long-term funding strategy.

The Statutory Minimum methods put into place in 2011 were intended to provide short-term budget relief for Employer contributions. An employer using the Statutory Minimum parameters for current funding should view the contributions as short-term relief. Our recommendation in this situation is for a pension fund and an employer to work towards a long-term funding strategy that better achieves the long-term funding goals, over a period that does not exceed 3-5 years.

The Securities and Exchange Commission in 2013 used the phrase “Statutory Underfunding” to describe situations where contributions appear to be more manageable in the short-term, but set up future contribution requirements that are less likely to be manageable.



## ***ILLINOIS STATUTORY MINIMUM CONTRIBUTION***

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### **ACTUARIAL METHODS – ILLINOIS STATUTORY MINIMUM CONTRIBUTION**

Actuarial Valuation Date	May 1, 2016
Data Collection Date	April 30, 2016
Actuarial Cost Method	Projected Unit Credit (Level % of Pay)
Amortization Method	Level % Pay (Closed)
Remaining Amortization Period	90% Funded over 24 Years
Asset Valuation Method	5-Year Smoothed Market Value

The contribution and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost methods described. The actuarial cost and amortization method allocates the projected obligations of the plan over the working lifetimes of the plan participants.

The recommended contribution amount shown in this report is based on the methods summarized above. The Actuarial Funding Policies section of the report will include a more detail description of the funding methods being used.

The Actuarial Funding Methods are meant to provide a systematic process for determining contributions on an annual basis. The methods do not impact the expectation of future benefit payments. The methods only impact the way dollars are contributed towards future benefit payments.

Different Actuarial Funding Methods may achieve funding goals with differing levels of success. Certain methods are more efficient and more stable on an annual basis.





## ACTUARIAL VALUATION DATA

Active Employees  
Retirees and Beneficiaries

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## *ACTUARIAL VALUATION DATA*

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### ACTIVE EMPLOYEES

	<u>Current Valuation</u>
Vested	7
Nonvested	<u>12</u>
Total Active Employees	<u>19</u>
Total Payroll	<u>\$ 1,125,178</u>

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### INACTIVE EMPLOYEES

	<u>Current Valuation</u>
Terminated Employees - Vested	0
Retired Employees	24
Disabled Employees	2
Other Beneficiaries	<u>5</u>
Total Inactive Employees	<u>31</u>

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### SUMMARY OF BENEFIT PAYMENTS

	<u>Current Valuation</u>
Terminated Employees - Vested	\$ -
Retired Employees	99,996
Disabled Employees	7,533
Other Beneficiaries	<u>8,121</u>
Total Inactive Employees	<u>\$ 115,650</u>

Benefits shown for terminated employees under deferred retirement are not currently in pay status.

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# ACTUARIAL FUNDING POLICIES

Actuarial Cost Method  
Financing Unfunded Accrued Liability  
Actuarial Value of Assets

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## ***ACTUARIAL FUNDING POLICIES***

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### **ACTUARIAL COST METHOD**

The actuarial cost method allocates the projected obligations of the plan over the working lifetimes of the plan participants.

In accordance with the Pension Fund's Funding Policy the actuarial cost method for the recommended contribution basis is Entry Age Normal (Level Percent of Pay). The Entry Age Normal Cost Method is 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. The portion of this actuarial present value allocated to a valuation year is called normal cost. The portion of the actuarial present value not provided at a valuation date by the actuarial present value of future normal costs is called the actuarial liability.

### **FINANCING UNFUNDED ACTUARIAL ACCRUED LIABILITY**

The Unfunded Actuarial Accrued Liability may be amortized over a period either in level dollar amounts or as a level percentage of projected payroll.

In accordance with the Pension Fund's Funding Policy for the recommended contribution the unfunded actuarial accrued liabilities are amortized by level percent of payroll contributions to 100% funding target over the remaining 20 future years.

### **ACTUARIAL VALUE OF ASSETS**

The pension fund is an ongoing plan. The employer wishes to smooth the effect of volatility in the market value of assets on the annual contribution. The Actuarial Value of Assets is equal to the Market Value of Assets with unanticipated gains/losses recognized over five years.

The asset valuation method is intended to create an Actuarial Value of Assets that remains reasonable in relation to the Market Value of Assets over time. The method produces results that can fall above and below the Market Value of Assets. The period of recognition is short.

It is intended that the period of recognition is short enough to keep the Actuarial Value of Assets within a decent range of the Market Value. The employer has not placed a specific corridor around the Market Value of Assets.





# ACTUARIAL ASSUMPTIONS

Nature of Actuarial Calculations  
Actuarial Assumptions in the Valuation Process  
Actuarial Assumptions Utilized

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# **ACTUARIAL ASSUMPTIONS**

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## **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. Certain plan provisions may be approximated or deemed immaterial, and, therefore, are not valued. Assumptions may be made about participant data or other factors. Reasonable efforts were made in this valuation to ensure that significant items in the context of the actuarial liabilities or costs are treated appropriately, and not excluded or included inappropriately.

Actual future experience will differ from the assumptions used in the calculations. As these differences arise, the expense for accounting purposes will be adjusted in future valuations to reflect such actual experience.

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 only and should not imply precision which is not inherent in actuarial calculations.

## **ACTUARIAL ASSUMPTIONS IN THE VALUATION PROCESS**

The contribution and benefit values of the Pension Fund are calculated by applying actuarial assumptions to the benefit provisions and census information furnished, using the actuarial cost methods described in the previous section.

The principal areas of financial risk which require assumptions about future experience are:

- Long-term Rates of Investment Return
- Patterns of Pay Increases for Members
- Rates of Mortality Among Members and Beneficiaries
- Rates of Withdrawal of Active Members
- Rates of Disability Among Members
- Age Patterns of Actual Retirement

Actual experience of the Pension Fund will not coincide exactly with assumed experience. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments to the computed contribution requirement.

From time to time it becomes appropriate to modify one or more of the assumptions, to reflect experience trends (but not random year-to-year fluctuations).

Details behind the selection of the actuarial assumptions can be found in the assumption document provided to the client. The client has reviewed and approved the assumptions as a reasonable expectation of the future anticipated experience under the plan.



## *ACTUARIAL ASSUMPTIONS*

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### ACTUARIAL ASSUMPTIONS UTILIZED

<b>Expected Return on Investments</b>	6.50% net of administrative expenses.
<b>CPI-U</b>	2.50%
<b>Total Payroll Increases</b>	3.25%
<b>Individual Pay Increases</b>	2.50% - 10.49%

Individual salary increases include a long-term average increase for inflation, average annual increases for promotions, and any additional increases for a step program. Sample Rates as Follows:

Service	Rate	Service	Rate
0	2.50%	8	2.50%
1	10.49%	9	8.51%
2	2.50%	10	4.00%
3	9.50%	15	6.51%
4	2.50%	20	4.00%
5	2.50%	25	3.50%
6	8.50%	30	3.50%
7	2.50%	35	3.50%

**Retirement Rates** 100% of the L&A Assumption Study Cap Age 65 for Firefighters 2016. Sample Rates as Follows:

Age	Rate	Age	Rate
50	0.068	53	0.111
51	0.080	54	0.132
52	0.094	55	0.155



## *ACTUARIAL ASSUMPTIONS*

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### **Withdrawal Rates**

100% of the L&A Assumption Study for Firefighters 2016. Sample Rates as Follows:

Age	Rate	Age	Rate
25	0.046	40	0.010
30	0.034	45	0.002
35	0.022	50	0.000

### **Disability Rates**

100% of the L&A Assumption Study for Firefighters 2016. Sample Rates as Follows:

Age	Rate	Age	Rate
25	0.0001	40	0.0030
30	0.0003	45	0.0055
35	0.0013	50	0.0092

### **Mortality Rates**

L&A Assumption Study for Firefighters 2016. Sample Male Rates as Follows:

Age	Rate	Age	Rate
25	0.00054	40	0.00071
30	0.00052	45	0.00108
35	0.00061	50	0.00187

L&A Assumption Study for Firefighters 2016. Sample Female Rates as Follows:

Age	Rate	Age	Rate
25	0.00017	40	0.00040
30	0.00023	45	0.00065
35	0.00030	50	0.00111

Mortality improvement to 5 years past the valuation date using MP 2014 is assumed. Active mortality (pre-retirement) and disabled mortality follow RP 2014.

### **Married Participants**

85% of Active Participants are Assumed to be Married. Female Spouses are Assumed to be 3 Years Younger than Male Spouses.





## SUMMARY OF PRINCIPAL PLAN PROVISIONS

Establishment of the Fund  
Administration  
Employee Contributions  
Normal Retirement Pension Benefits  
Pension to Survivors  
Termination Benefits  
Disability Benefits

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## ***SUMMARY OF PRINCIPAL PLAN PROVISIONS***

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### **ESTABLISHMENT OF THE FUND**

The Firefighters' Pension Fund is established and administered as prescribed by "Article 4. Firefighters' Pension Fund – Municipalities 500,000 and Under" of the Illinois Pension Code.

### **ADMINISTRATION**

The Firefighters' Pension Fund is administered by a Board of Trustees located in each municipality maintaining a pension fund for its firefighters. Its duties are to control and manage the pension fund, to hear and determine applications for pensions, to authorize payment of pensions, to establish rules, to pay expenses, to invest funds, and to keep records.

### **EMPLOYEE CONTRIBUTIONS**

Employees contribute 9.455% of salary.

### **NORMAL RETIREMENT PENSION BENEFIT**

#### Hired Prior to January 1, 2011

*Eligibility:* Age 50 with at least 20 years of creditable service and no longer a firefighter.

*Benefit:* 50% of final salary is payable commencing at retirement for 20 years of service. An additional 2.5% of final salary is added for each additional year of service (prorated monthly) in excess of 20 years of service (not to exceed 75% of final salary). "Final salary" is based on the pay rate for the firefighter at retirement.

*Annual Increase in Benefit:* A firefighter is entitled to an initial pension increase equal to 1/12 of 3% of the original monthly benefit for each full month that has passed since the pension began. The initial increase date will be the later of the first day of the month following the attainment of age 55, or the first anniversary of the date of retirement. Subsequent increases of 3% of the current pension amount will be provided in each January thereafter.



## ***SUMMARY OF PRINCIPAL PLAN PROVISIONS***

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### **NORMAL RETIREMENT PENSION BENEFIT - CONTINUED**

#### Hired on or After January 1, 2011

*Eligibility:* Age 55 with at least 10 years of creditable service and no longer a firefighter.

*Benefit:* 2.5% of final average salary for each year of service is payable at retirement (not to exceed 75% of final average salary). "Final average salary" is determined by dividing the highest total salary over 96 consecutive months of service in the last 120 months of service by the total number of months of service in the period. Annual salary for this purpose will not exceed \$106,800, indexed by the lesser of 3% or ½ of the CPI-U for the 12 months ending with the September preceding each November 1. The salary cap will not decrease.

*Annual Increase in Benefit:* The initial increase date will be the January 1<sup>st</sup> following the attainment of age 60, or the first anniversary of the date of retirement. Subsequent increases will occur on each subsequent January 1<sup>st</sup>. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original pension amount.

### **EARLY RETIREMENT PENSION BENEFIT**

#### Hired Prior to January 1, 2011

None

#### Hired on or After January 1, 2011

*Eligibility:* Age 50 with at least 10 years of creditable service and no longer a firefighter.

*Benefit:* The normal retirement pension benefit reduced by ½ of 1% for each month that the firefighter's age is under age 55.

*Annual Increase in Benefit:* The initial increase date will be the January 1<sup>st</sup> following the attainment of age 60, or the first anniversary of the date of retirement. Subsequent increases will occur on each subsequent January 1<sup>st</sup>. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original pension amount.



## ***SUMMARY OF PRINCIPAL PLAN PROVISIONS***

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### **PENSION TO SURVIVORS**

#### Hired Prior to January 1, 2011

##### Death - Line of Duty

Surviving spouse is entitled to 100% of the salary attached to the rank of the firefighter on the last day of service, payable immediately.

##### Death - Non-Duty

*Current Pensioners (Including Disabled Pensioners):* Surviving spouse to receive continuation of the pension at the time of death or 54% of pensionable salary at the time pension began, if greater.

*Active Employee with 20+ Years of Service:* Surviving spouse is entitled to the full pension earned by the firefighter at the time of death, or 54% of the pensionable salary at death if greater.

*Active Employee with 10-20 Years of service:* Surviving spouse is entitled to 54% of the salary attached to the rank of the firefighter on the last day of service, payable immediately

*Annual Increase in Benefit:* None.

#### Hired on or After January 1, 2011

##### Death - Line of Duty

Surviving spouse is entitled to 100% of the salary attached to the rank of the firefighter on the last day of service, payable immediately.

##### Death - Non-Duty

*Current Pensioners (Including Disabled Pensioners), Active Employee with 20+ Years of Service, and Active Employee with 10-20 Years of service:* Surviving spouse to receive 66 ⅔% of the firefighter's earned pension at the date of death.

*Annual Increase in Benefit:* The initial increase date will be the January 1<sup>st</sup> after the attainment of age 60 by the recipient of the survivor's pension. Subsequent increases will occur on each subsequent January 1<sup>st</sup>. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original survivor's pension amount.



## ***SUMMARY OF PRINCIPAL PLAN PROVISIONS***

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### **TERMINATION BENEFIT**

#### **Hired Prior to January 1, 2011**

*Eligibility:* At least 10 years but less than 20 years of creditable service.

*Benefit:* An accrual factor times final salary for each year of service is payable beginning at age 60. “Accrual Factor” is a factor of 1.5% at 10 years of service, increasing ratably up to 2.4% at 19 years of service. “Final salary” is based on the pay rate for the firefighter on the date of separation.

*Annual Increase in Benefit:* A firefighter will receive an initial increase of 3% on the first anniversary of the date of start of payments. Subsequent increases of 3% of the current pension amount will be provided in each January thereafter.

#### **Hired on or After January 1, 2011**

*Eligibility:* At least 10 years but less than 20 years of creditable service.

*Benefit:* An accrual factor times final salary for each year of service is payable beginning at age 60. “Accrual Factor” is a factor of 1.5% at 10 years of service, increasing ratably up to 2.4% at 19 years of service. “Final salary” is based on the greater of salary during the last year of service prior to termination of employment or the pay rate for the firefighter at termination of employment. Annual salary for this purpose will not exceed \$106,800, indexed by the lesser of 3% or ½ of the CPI-U for the 12 months ending with the September preceding each November 1. The salary cap will not decrease.

*Annual Increase in Benefit:* The initial increase date will be the January 1<sup>st</sup> following the first payment. Subsequent increases will occur on each subsequent January 1<sup>st</sup>. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original pension amount.



## ***SUMMARY OF PRINCIPAL PLAN PROVISIONS***

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### **DISABILITY BENEFIT**

#### Hired Prior to January 1, 2011

*Eligibility:* Disability (duty; or non-duty with 7 years of service).

*Benefit:* A firefighter who becomes disabled on duty is entitled to receive a pension equal to the greatest of 65% of final salary or the pension they would have been entitled to upon retirement at the time of disability. For a non-duty disability, the firefighter is entitled to 50% of final salary. “Final salary” is based on the pay rate for the firefighter at retirement.

*Annual Increase in Benefit:* The initial increase date will be the January 1<sup>st</sup> following the attainment of age 60. Subsequent increases will occur on each subsequent January 1<sup>st</sup>. The first increase is 3% of the original benefit for each full year that has passed since the pension began. Subsequent increases are 3% of the original pension benefit amount.

#### Hired on or after January 1, 2011

*Eligibility:* Disability (duty; or non-duty with 7 years of service).

*Benefit:* A firefighter who becomes disabled on duty is entitled to receive a pension equal to the greater of 65% of final salary or the pension they would have been entitled to upon retirement at the time of disability. For a non-duty disability, the firefighter is entitled to 50% of final salary. “Final salary” is based on the pay rate for the firefighter at last day of service.

*Annual Increase in Benefit:* The initial increase date will be the January 1<sup>st</sup> following the attainment of age 60. Subsequent increases will occur on each subsequent January 1<sup>st</sup>. The first increase and subsequent increases will be the lesser of 3% of the original benefit or ½ of the CPI-U for the 12 months ending with the September preceding each November 1, applied to the original pension amount.





## GLOSSARY OF TERMS

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## **GLOSSARY OF TERMS**

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### **GLOSSARY OF TERMS**

**Actuarial Accrued Liability** –The actuarial present value of future benefits based on employees’ service rendered to the measurement date using the selected actuarial cost method. It is that portion of the Actuarial Present Value of plan benefits and expenses allocated to prior years of employment. It is not provided for by future Normal Costs.

**Actuarial Cost Method** – The method used to allocate the projected obligations of the plan over the working lifetimes of the plan participants.

**Actuarial Value of Asset** – The value of the assets used in the determination of the Unfunded Actuarial Accrued Liability. The Actuarial Value of Assets is related to Market Value of Assets, with adjustments made to spread unanticipated gains and losses for a given year over a period of several years. Actuarial Value of Assets is generally equally likely to fall above or below the Market Value of Assets, and generally does not experience as much volatility over time as the Market Value of Assets.

**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.

**Funding Policy** – A set of procedures for a Pension Fund that outlines the “best practices” for funding the pension benefits based on the goals of the plan sponsor. A Funding Policy discusses items such as assumptions, Actuarial Cost Method, assets, and other parameters that will best help the sponsor meet their goal of working in the best interest of the plan participant.

**Market Value of Assets** – The value of the cash, bonds, securities and other assets held in the pension trust as of the measurement date.

**Normal Cost** –The present value of future benefits earned by employees during the current fiscal year. It is that portion of the Actuarial Present Value of benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.

**Unfunded Actuarial Accrued Liability** – The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. The Unfunded Actuarial Accrued Liability is amortized over a period either in level dollar amounts or as a level percentage of projected payroll

