

**CITY OF FREEPORT
FIREFIGHTERS' PENSION FUND**

**ACTUARIAL VALUATION
AS OF MAY 1, 2017 FOR THE
FISCAL YEAR ENDING APRIL 30, 2018**

October 16, 2017



**Tepfer
Consulting
Group, Ltd.**

One Overlook Point - Suite 130
Lincolnshire, IL 60069
847-509-7740
Fax: 847-509-7745

Actuaries and Administrators

October 16, 2017

Ms. Linda L. Buss, Treasurer
Freeport Firefighters' Pension Fund
524 West Stephenson Street, Suite 200
Freeport, Illinois 61032

RE: Freeport Firefighters' Pension Fund

Dear Linda:

Enclosed is our **FUNDING ACTUARIAL VALUATION REPORT** for the **Freeport Firefighters' Pension Fund** for the fiscal year May 1, 2017 through April 30, 2018.

The results of our valuation indicate that the recommended minimum contribution from the City for the next tax year is **\$1,434,173** or **44.87%** of current payroll. This contribution coupled with the anticipated \$290,580 or 9.455% of current payroll to be collected from participating firefighters will be sufficient to meet the State statutory requirements described in 40 ILCS 5/4. Further information is provided within our report.

Please note that, because of the implementation of GASB 67, the recommended contribution is calculated to provide a 100% funding target rather than the statutorily required 90%. This contribution is also the Actuarially Determined Employer Contribution (ADEC) in accordance with the adopted funding policy.

The change in recommended contribution resulting from actual plan experience is \$ 91,152 as shown in Exhibit 3-B.

Alternatively, under the current statute, our valuation results indicate the statutory minimum contribution for the City for the next tax year to be \$ 957,165 or 29.95%. This remains at a 90% target.

The increase in employer pension contributions resulting from the implementation of P.A. 93-0689 has been estimated to be \$ 37,663.

GASB 67 and 68 information, if requested, is provided in a separate report.

Factors Influencing the Choice of Actuarial Assumptions

As part of the consulting process, it is our policy to talk with selected members of the Board of Trustees and the Sponsor's representatives for the **City of Freeport Firefighters' Pension Plan** to obtain information which will enable the Actuary to properly choose the actuarial assumptions which are most appropriate for the current cost determination for the pension fund.

As part of this process, statistics are compiled concerning historical investment returns, salary increases, retirement incidence and other factors which are influential in the actuarial assumption setting process. Based upon an analysis of the specifics as they relate to the **City of Freeport Firefighters' Pension Plan** and a general understanding of the inter-relationships of the actuarial assumptions, the Board, the Sponsor and the Actuary reach an agreement as to the assumptions which will be used in the current actuarial valuation. The ultimate decision, nonetheless, remains with the actuary who must abide by his professional standards and judgment.

Published statistics regarding experience for police and firefighters are available from the State of Illinois Department of Insurance. These statistics form the basis of the actuarial assumptions selected by the State Actuary in the valuation of pension funds covered under the Downstate Pension System. We have found in our consulting, that whenever appropriate, the actuarial assumptions used by the State Actuary are relied upon as a **starting point**. However, to make the calculations more "**Freeport-sensitive**", the analysis of the actual historical performance is carefully examined.

Experience Analysis

Actuarial assumptions are not sacrosanct. In fact, it is not uncommon for actuarial assumptions to be changed to better reflect a plan's experience and prognosis. Each year the actuarial process examines the experience of the fund. General parameters indicate that a variance of less than 3% of the actuarial accrued liability is acceptable to assure that the assumptions used remain suitable. The measurement compares the actual unfunded liability to the expected unfunded liability. The total gain and loss developed is then analyzed by individual assumption, where available, to assure appropriateness. Based upon the results of this year's analysis, both in aggregate and individually, we have determined that the chosen assumptions remain suitable for continued use. A single year deviation is not an automatic trigger for a change in assumptions. Instead, multiple years are monitored and changes in assumptions generally occur only after trends are discovered.

Approach to Setting Actuarial Assumptions including valuation date and source of actuarial data (please see the section in the report beginning on Page 3)

The complete actuarial assumptions used in this valuation are contained in Appendix 1. Although specific assumptions must be used in the mathematical exercise, actuarial assumptions are better viewed as a range. Actuarial Professional Standards indicate that in the selection of economic assumptions, a "best-estimate" range should be developed. Based upon our analysis of Downstate Police and Fire Pension funds we have developed the following best estimate ranges for economic assumptions:

Investment Return	6.50% - 7.50%
Inflation:	1.50% - 2.50%
Compensation Scale	Rates ranging from 4.86% to 1.12% varying by age, plus an inflation factor
Payroll Growth	3.50% - 4.50%

Actuarial Professional Standards indicate that in the selection of non-economic assumptions, a reliance upon published tables and/or individual experience studies pertinent to the group are acceptable procedures. Based upon our analysis of experience for approximately 70 Downstate Police and Fire Pension funds we have developed the following general rates for non-economic assumptions:

Mortality Rates (active and disabled)-Published tables loaded for public safety employees
Termination rates – aged based rates ranging from 7% to 1%
Disability rates - aged based rates ranging from 0.13% to 0.16%
Retirement rates – aged based rates ranging from 36% to 100%

At this point in time, these rates are applied to all participants without regard to tier. It is anticipated that once experience is developed, the retirement rates for tier 2 employees may be modified

Demographic considerations and financial implications

For this valuation, it was noted that the force continues to remain stable as to its size and demographic composition. In the current valuation, it was observed that the ratio of the number of inactive participants (60, exclusive of terminated employees who are due a refund of their contributions) to the active participants (49) in the Fund remains at **122.45 which continues to be above many other funds in the State**. The average age and service of the active participating group is not unreasonable for a fund of this size. However the presence of so many inactive participants causes a constant drain on the assets with virtually all of the contributions are being used to pay benefits. *

There are currently 13 firefighters who are eligible to retire and 6 additional firefighters who will become eligible in the next 5 years. This represents about 38% of the current active group. Additionally, pension payments have been modestly escalating. However, Absent a large growth in the active force, with proper funding, the fund's position should become even more favorable for the foreseeable future **and the fund is in a strong financial condition**.

As a percentage of the total pension liabilities, the liabilities for inactive participants represent over 65% of the total liabilities. **This remains a positive statistic.** *

Financial considerations

As would be expected in this situation, a large portion of the total assets available for investment (87%) has been committed to provide benefits for existing pensioners and beneficiaries. Additionally, pension disbursements on an annual basis total over \$2.4 million.

In these uncertain times, the fund continues to experience very limited short-term investment growth, yet the fund continues to maintain adequate funded ratios. The fund has earned outstanding rates of return over the short term. As shown in Exhibit 5-C of our report, the composite rate of return for the fund since 2010 is 8.50%. The investment smoothing method adopted initially by the fund and now mandated by statute serves to level the contribution and shield against annual investment volatility. However, it is not unnoticed that annual pension payments still exceeded the investment income during 2017 and an annual investment return of 7.37% is needed to cover the outgoing benefit expenses. The Trustees should be advised that this is a potentially dangerous situation regarding the fund. Clearly municipal contributions will remain at these levels until the fund can annually increase its investment return.

Mean
7.37%
to Remain
Level.

As indicated last year, municipal contributions and contributions by active firefighters are being used to pay current pension payments. These funds are generally the major source of new funds for investment purposes to accumulate reserves. Even with improved investment returns, the maturing of the employee group requires that the fund be carefully monitored during the next few years to assure that an orderly funding progress is maintained. If investment income remains insufficient to pay the existing pensioners, then municipal and participant contributions will continue to be used.

The ongoing commitment of the City toward making recommended contributions has served the fund well and the positive investment return by the Plan's fiduciaries have provided a strong platform for continued stability and growth,

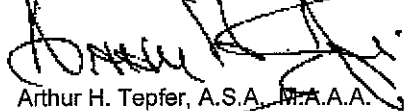
At this point, we suggest that the City consider making a cash infusion into the Pension Program. Although not required, this infusion would serve to "shore up" the fund and provide for another layer of stability.

We ask that you review the section entitled "Actuarial Experience since the last actuarial valuation" beginning on page 3 for a further explanation of what has occurred since the last actuarial valuation.

Please do not hesitate to contact us if you have any questions concerning our report.

Sincerely,

~~TCG PUBLIC CONSULTING, LTD.~~



Arthur H. Tepfer, A.S.A., F.A.A.A.
Consulting Actuary

AHT/lf
Encl.

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ACTUARIAL STATEMENT

TCG Public Consulting, Ltd. was retained by the City of Freeport and the City of Freeport Firefighters' Pension Plan to perform an independent actuarial valuation for the Firefighters' Pension Fund. This valuation is permitted under 40 ILCS 5/22, Section 503.2.

The actuarial valuation was performed for the year ended April 30, 2018 and indicates a **statutorily required contribution in accordance with 40 ILCS 5/3, Section 125 of \$957,165 or 29.95% of member payroll, a recommended minimum contribution of \$1,434,173 or 44.87% of payroll.** These contributions are net of contributions made by active member firefighters during the fiscal year. The recommended minimum contribution also serves as the Actuarially Determined Employer Contribution (ADEC) for purposes of GASB 67 and 68.


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

In our opinion, all calculations and procedures are in conformity with generally accepted actuarial principles and practices; and the results presented comply with the requirements of the applicable State statute, Actuarial Standards Board, or Statements of Governmental Accounting Standards, as applicable.

In our opinion, the actuarial assumptions used are reasonable, taking into account the experience of the plan and future expectations, and represent a reasonable and adequate approach to the financing of the retirement program. The costs, actuarial liabilities and other information presented in this report, in our opinion, fully and fairly disclose the actuarial position of the plan.

I, Arthur H. Tepfer, am an Enrolled Actuary in good standing under the Employee Retirement Income Security Act of 1974. I am a member of the American Academy of Actuaries and I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. I certify that the results presented in this report are accurate and correct to the best of my knowledge.

TCG PUBLIC CONSULTING, LTD.



Arthur H. Tepfer, A.S.A., M.A.A.A.
Enrolled Actuary #17-02352

October 16, 2017

***Statement No. 25* of the Governmental Accounting Standards Board has been replaced by Statement No. 67. Information pertaining to Statement 67 is not included in this valuation report.**

VALUATION OBJECTIVES

The **City of Freeport Firefighters' Pension Plan** provides benefits to members when they retire, die, become disabled or terminate employment. As with any plan providing these types of benefits, an appropriate budgeting pattern must be established to enable appropriate funds to be accumulated to meet all payments when due. The actual cost of the plan can best be expressed in the following simplistic manner:

ACTUAL COST EQUALS

Benefits Paid
Plus
Expenses Paid
Less
Investment Income Earned

If the actual cost is incurred on a "pay as you go" basis, then the future generations of members will be paying for the benefits of current plan participants. Proper financial planning calls for budgeting the actual cost of the plan over the working lifetime of current plan membership in order to establish an equitable allocation. An actuarial valuation is the procedure used to determine an appropriate amount to be contributed to the pension plan each year in order to attain this equity.

An actuarial valuation is an estimate at a point in time of the assumed incidence of the future benefit costs. Since the total actual cost of the plan is essentially unknown, pre-funding (budgeting for future benefit costs) requires certain assumptions about future events. Assumptions are made for such things as salary increases, terminations of participants, disablement of participants, death of participants and anticipated investment earnings. These assumptions, although not affecting the actual costs of the plan, will affect the incidence of calculated future costs. For proper funding, it is required that the Actuary select assumptions which are appropriate considering the economic, demographic, and legislative environment as they relate to the pension program. Additionally, the actuary is bound by Actuarial Standards of Practice ("ASOP's") as published by the Actuarial Standards Board. The assumptions we have made concerning these future events are described more fully in Appendix 2 of this report. Based on these assumptions, a projection of future benefits was made and a current contribution level sufficient to provide the anticipated benefit payments was determined using an actuarial cost method.

Selection of the Actuarial Cost Method

An actuarial cost method, sometimes called a "funding method", therefore, is essentially an approach to budgeting the estimated future costs. There are many actuarial cost methods which are available to the actuary and each method operates differently. However, all funding methods accomplish the same objective—to assign to each fiscal year of the employer the portion of the expected actuarial value of benefits assumed to have accrued in that year. The portion of the actuarial value of benefits assigned to a year in respect of an individual participant or the fund as a whole is called the **normal cost**. All funding methods are described by how the normal cost is calculated.

The actuarial cost method prescribed by the State statutes to determine the **statutorily minimum required contribution** for periods on or after January 1, 2011 is the Projected Unit Credit Cost Method. Under this actuarial cost method, the ongoing cost as a percentage of total payroll will increase. In this method, the normal cost is determined by first calculating the projected dollar amount of each participant's accumulated benefit under the plan as of both the first day of the fiscal year and as of the last day of the fiscal year and then determining the difference between these two amounts. The second step in deriving the normal cost for a given participant is to multiply the dollar amount of this difference by the actuarial present value of \$1 of benefit.

The actuarial cost method selected by our firm to determine the **recommended plan contribution** is the Entry Age Normal Cost Method. Under this actuarial cost method, ideally, the ongoing cost expressed as a percentage of total payroll should remain fairly stable. In this method, the normal cost is determined by assuming each participant covered by the plan entered the plan under the same conditions that will apply to future plan entrants. The annual normal cost assigned to each year of an employee's career is calculated as a level percentage of the employees assumed earnings each year. These normal costs accumulate to the present value of the employee's benefit at retirement age.

**VALUATION OBJECTIVES
(Continued)**

Under both the Entry Age Normal Cost Method and the Projected Unit Credit Cost Method, the total funding of projected benefit costs is allocated between an ***unfunded liability***, representing past benefit history, and future normal costs. This allocation assumes that the municipality will pay the normal cost for each plan year on a regular basis. It should be noted that although the term "unfunded liability" is applied to both funding methods, the resulting amount is different because of the method of calculation. Another feature of these methods is that only the unfunded liability (not the Normal Cost) is affected by the experience of the plan, and, therefore, any adjustments are made only in the future amortization payments.

In addition to the methodology changes described above, P.A. 96-1495 also addressed the valuation of pension fund assets—the second component in the determination of the unfunded liability. The statute now provides that the actuarial value of a pension fund's assets be set equal to the market value of the assets on March 30, 2011 and that, in determining the actuarial value of assets after that date, any actuarial gains or losses from investment returns incurred in a fiscal year be recognized in equal amounts over the 5-year period following that fiscal year.

The actuarial valuation process is usually repeated each year and is to a certain extent self-correcting. As part of these actuarial cost methods, any deviation of actual experience from the chosen actuarial assumptions will be reflected in future contributions. A complete description of these actuarial cost methods is explained in Appendix 4 of this report.

Despite the statutory language which requires an application of the Projected Unit Credit method, we feel that funding under this method as a *level percentage of payroll* severely undermines the benefit security of the retirement system and transfers the payment for currently earned pensions to future generations of taxpayers. For these reasons, our valuation report also presents a recommended minimum contribution that will operate to maintain the fundamental fiscal soundness of the retirement program, although a statutorily required contribution has also been calculated. The calculation of the **recommended minimum contribution** is based upon an **amortization payment of 100% of any unfunded accrued liabilities as a level dollar amount** over 30 years from January 1, 2011, the effective date of P.A. 96-1495. The calculation of the statutorily required contribution is based upon an **amortization payment of 90% of any unfunded accrued liabilities as a "level percentage of payroll"** over 30 years from January 1, 2011, the effective date of P.A. 96-1495. *

Although, we do not agree with the statutorily required level percentage of payroll methodology of determining the amortization of the unfunded accrued liability, I would be remiss if I did not advise my funds as to a "statutorily" acceptable calculation under the State law.

Approach to Setting Actuarial Assumptions (the Debate Continues)

In February 2014, the Society of Actuaries released a "Report of the Blue-Ribbon Panel on Public Pension Plan Funding" which focuses on the development of recommendation for strengthening public plan funding. Some of the recommendations are as follows:

Adequacy: Funding entities and plan trustees should strive to fund 100% of the obligation for benefits using assumptions that are estimated to be realizable 50% of the time.

Intergenerational Equity: Fully funding pension benefits over the average future service period of employee reasonably aligns the cost of the benefits of the public services with the taxpayers who benefit from those services.

Cost Stability and Predictability: Level costs over an intermediate period is often at odds with the goals of adequacy and intergenerational equity. Funding by allocating a significant portion to higher-risk, more volatile assets will tend to undermine the goal of cost stability. Adequacy and intergenerational equity should take precedence over the goal of cost stability and predictability.

**VALUATION OBJECTIVES
(Continued)**

The Interest Rate Assumption

Regarding the choice of interest rate, the following is helpful:

According to the report, public retirement systems should use a forward-looking rate to discount pension liabilities rather than actual plan returns.

The new rate would replace the actual long-term rate of return on plan assets generally used now to discount liabilities and set contribution levels

The panel rejected use of a risk-free rate — or rates on the Treasury yield curve — to discount liabilities despite the basis in economic theory to balance generational risks, instead

"Plans should be using rates of return that they believe can be achieved over the next 20- to 30-year period with a 50% probability," the report said.

"The panel does not believe the rate should be aggressively conservative, as doing so may lead to a surplus." When making assumptions, "it is important to consider the extent to which future economic and market conditions may differ from those of today or of the past," ... noting that "the long-term secular decline in interest rates ... strongly suggests that the robust fixed-income performance of the past is not likely to be repeated in the future."

It is our opinion that other specific factors in the Downstate System must also be considered in the choice of a "funding interest rate" assumption. The Police and Fire Pension funds in the Downstate System are limited in their investment opportunities by State Statutes. Depending upon the current amount of assets in the fund, various investments are not permitted. Unfortunately, in our opinion, these limitations have a negative impact on fund growth.

We believe that these statutory limitations are counter-productive to fund growth. Additionally, the newly applicable GASB disclosure rules require Financial Reporting under lower interest rate assumptions than historically used for funding calculations.

It is anticipated that many Pension Boards will reassess the overall investment portfolio to balance the competing funding requirements and the financial disclosure rules. We hope that the Legislature also will respond to the increasing need of more investment latitude to the Pension Fund Trustees.

What is the appropriate practice for measuring public pension plan liabilities: is it "level cost" or "market pricing?"¹

Actuaries and economists have been debating this ongoing controversy for ten years. Which of the competing methods is "correct," and can both camps coexist?

The Methods

The level cost model is based on long-term methods and assumptions:

- discount rate is the long-term expected return on assets in the plan's investment portfolio.
- cost method is a level cost based on projected benefits (generally Entry Age).
- such calculations are based on established funding practices.

Whereas the market pricing model uses current methods and assumptions:

- discount rate is based on market yields on low risk bonds (with a default risk comparable to the public pension promise).
- cost method is an increasing cost based on accrued benefits (Unit Credit).
- such calculations² are based on "financial economics."

¹ Excerpted from The Journal of the Conference of Consulting Actuaries, The Consulting Actuary, Volume XXIX Number 1

VALUATION OBJECTIVES

(Continued)

What is "financial economics?" The key tenet of financial economics is that there can be no arbitrage (no free lunch) where an investment yields an immediate risk-free profit. Two cash flows identical in amount, risk, etc. must have identical market prices (the Law of One Price), otherwise an arbitrage opportunity will exist. For pension plans, financial economics measures a liability by using the discount rate embedded in an asset portfolio with matching cash flows (namely bonds, in the view of market pricing proponents).

Liabilities should be valued without regard to funding strategy, and expected excess returns should be recognized after they materialize. Focus is on current values. Most discussion has been on whether public pension plans should disclose a market pricing type measure.

In fact, the three possible applications are (1) to disclose a market value Accrued Benefit Obligation (**ABO**), (2) to fund based on a risk-free rate based ABO, or (3) to invest only in bonds. The rationales for each are as follows:

1. The economic liability is an ABO valued at current market (default) risk-free rates;
2. Funding based on a risk-free discount rate (even if invested in equities) avoids kicking the "risk" can down the road to future generations of taxpayers; and
3. Investing only in bonds avoids increasing taxpayers' equity risk exposure.

Should public plans disclose a market pricing type measure using a (default) risk-free discount rate?

The Governmental Accounting Standards Board (GASB) first added the issue to their agenda in 2008. Following an "Invitation to comment," GASB issued a preliminary views document and two exposure drafts, before releasing final Statements 67 and 68 in August 2012. In those statements, GASB unequivocally endorsed the level cost model for accounting and financial reporting with the discount rate to be based on expected return (if the plan has assets) and the cost method to be Entry Age. The Actuarial Standards Board (ASB) began reviewing two key Actuarial Standards of Practice (ASOPs) in 2011. Following numerous discussion drafts, exposure drafts and working drafts, ASOP 4 (Measuring Pension Obligations) and ASOP 27 (Selecting Economic Assumptions) were revised in December 2012 and September 2013 respectively. Incorporating requests from the American Academy of Actuaries' (AAA) Public Interest Committee (PIC) and Board, the discussion draft of ASOP 4 defined a "market-consistent" present value (MCPV). However, resulting comments argued that the MCPV is a type of measure, not a single measure. When issued, the final ASOPs 4 and 27 instead stressed the "purpose of the measurement." ASOP 4 stated: "When measuring pension obligations and determining periodic costs or contributions, the actuary should reflect the purpose of the measurement." ASOP 27 stated: "The actuary should consider the purpose of the measurement as a primary factor in selecting a discount rate." Interestingly, both standards included the market-pricing model not only as a type of measurement but also as an example of a purpose of the measurement!

However, it should be noted that it is our opinion that, under current conditions, a market pricing valuation would cause confusion and, therefore, at this juncture we are not including a market-pricing model in this valuation report.

Specific thoughts on the Mortality Assumption

The mortality assumption can be viewed in one of two ways:

1. How long will a participant and or beneficiary continue to participate in the plan? – probability of surviving.
2. When will benefit accruals or payments cease? – probability of not surviving.

Mortality studies are generally performed based upon the experience of large populations and are published by the Society of Actuaries. In our opinion, **there are no *credible* published tables for the Downstate Police and Fire Pension System, despite the recent experience study completed by the Department of Insurance.** With the publication of the RP-2014 Mortality Table, we found it necessary to examine our existing mortality assumption (based upon the RP-2000 table issued in the early portion of this century).

**VALUATION OBJECTIVES
(Continued)**

The Downstate System contains many small funds which are not suitable for a mortality study (despite the DOI promulgation). We reject the use of the unloaded RP-2000 Blue Collar table and instead assume an increased mortality risk for public safety personnel. The RP-2014 table is unsuitable because it excluded any experience from public plans. The RP-2000 mortality table, in our opinion, is a more appropriate table to use as a base. The RP-2000 table, although a static table, comes with a generational approximation technique using a mortality projection scale. Two scales are provided by the study scale AA and Scale BB. Scale AA has been proven to be non-predictive and is no longer suggested. Scale BB is now the preferred projection scale. With all this in mind, our mortality assumption is the following:

**RP-2000 Combined Healthy Male with Blue Collar adjustment,
projected to 2015 by Scale BB**

The Choice of the Actuarial Valuation Date and the Source of the Actuarial Data

Actuarial valuations can be performed as of any date. Ideally the data used (census and financial) should be representative of the fund on the actuarial valuation date. Actuarial Standards of Practice require the actuary to disclose the sources of the data and indicate whether the actuary has reviewed the data. The actuary additionally must disclose the extent of the actuary's reliance on the data and other relevant information to use of data supplied by others; any material adjustments or assumptions the actuary applied to the data, any limitations on the use of the actuarial work product due to uncertainty about the quality of the data and any unresolved concerns the actuary may have about the data that could have a material effect on the actuarial work product.

The actuarial valuation results presented in this report are calculated based upon data provided by each fund and/or sponsoring municipality and are taken from the Department of Insurance (DOI) Annual Statement Filing as of the end of the fiscal year prior to the valuation date. For example, funds with a fiscal year beginning January 1, 2016 use a valuation date of January 1, 2016 and actuarial data is used from the Annual Statement filing for the period ending December 31, 2015. This data is provided to the actuary by the fund, the fund's auditors, the sponsoring entity and/or the sponsoring entity's auditor. The data is used for both the actuarial valuation to determine funding for the fiscal year beginning on the valuation date; and is also used to calculate the Actuarially Determined Employer Contribution (ADEC) as required under GASB standards for the year ending on fiscal year prior to the valuation date.

The assumption is made that there is no material difference in data between these two dates and that this data is acceptable, without additional actuarial review or adjustment, for the valuation being presented.

Actuarial Experience since the last actuarial valuation

As part of the actuarial valuation process, it is helpful to examine the actual experience of the fund as compared to the experience which is expected by the actuarial assumptions. The measurement of any deviations of actual to expected experience is commonly referred to as a "Gain and Loss Analysis". In performing this analysis, the actuary analyzes each actuarial assumption used in the valuation process. It is highly unlikely that actual experience will follow expected experience on a year-by-year basis. It is hoped that over the long term, if the actuarial assumptions are "reasonable", the total gains and losses will offset each other.

A "gain and loss analysis" is a useful tool to examine whether the actuarial assumptions used to determine the municipal tax levy are suitable. Care must be taken in placing too much credibility in a short-term analysis as the assumptions are more appropriately measured over the long term. Nonetheless, an annual evaluation of the actuarial assumptions will assist in identifying trends which, if unnoticed, can lead to inappropriate conclusions. When these trends are recognized, it is the actuary's responsibility to modify one or more of the assumptions to better anticipate future experience.

**VALUATION OBJECTIVES
(Continued)**

Some assumptions are easier to measure than others. In small plans, credible analysis can generally be made regarding the economic (financial) assumptions. These primarily include investment and salary increase assumptions. Unfortunately, it is often impossible to establish credible long term analysis of demographic assumptions (rates of termination, disability, retirement and mortality). Therefore, in choosing demographic assumptions, the actuary generally relies upon standardized tabular assumptions modified only by fund-specific characteristics.

The actuarial gain and loss analysis for the current year is presented in Exhibit 3-C and 3-D of the report. Exhibit 3-C shows the impact of the actuarial gains or losses on the recommended minimum contribution through a reconciliation of this contribution from the end of the prior valuation year to the end of the current valuation year. Exhibit 3-D derives the actuarial gain or loss in total as well as separating the individual financial and demographic components.

The overall experience gain (loss) for the year was \$ (575,651) or 1.27% of the accrued liability at the beginning of the plan year. The dollar amount for the plan's current **recommended minimum contribution** is 106.79% of the prior year's contribution. When measured as a percentage of payroll, the contribution level has changed from 44.08% to 44.87%. ✕

Thirty-year Projection of Liabilities

The final section of our report illustrates projected payments from the Trust Fund for a 30-year period commencing with the valuation date. These projections are based upon the actuarial assumptions selected for the fund concerning death, disability and retirement occurring. Care should be taken in interpreting or relying on these results— particularly for Funds with fewer than 200 participants. The credibility of this type of projection is rarely realized beyond 10 years. Exhibit 5D presents this projection.

RESULTS OF VALUATION

The following exhibits present the results of our actuarial valuation of the **City of Freeport Firefighters' Pension Plan** for the fiscal year May 1, 2017 through April 30, 2018.

Exhibit 1 indicates that the recommended minimum contribution, calculated using the Entry Age Normal Cost method (EANC), from the City is \$1,434,173 or 44.87% of total participating payroll. **Under the Entry Age Normal actuarial cost method selected, this percentage of payroll should remain reasonably level over the lifetime of the plan.** ✓

Exhibit 1 also indicates that the statutory minimum contribution, calculated using the Projected Unit Credit method (PUC), from the City is \$957,165 or 29.95% of total participating payroll. **Under the Projected Unit Credit actuarial cost method selected, this percentage of payroll should increase over the lifetime of the plan.** ✓

Exhibits 2 and 3 provide specific information used to develop the recommended minimum and statutorily required the City contribution.

Contribution amounts presented in this report have been adjusted for interest to the date of payment. All values were determined based on the actuarial assumptions and methods as more fully described in Appendix 1 of this report.

Exhibit 4 presents a brief description of the demographic characteristics of the current member group.

Exhibit 5 shows information relating to the pension assets.

**GENERAL VALUATION RESULTS FOR FISCAL YEAR
MAY 1, 2017 THROUGH APRIL 30, 2018**

Recommended Minimum Contribution

1.	Entry Age Normal Cost:	\$ 753,261	
2.	Unfunded Actuarial Accrued Liability (or Surplus):	10,356,609	
3.	Actuarial Value of Assets:	34,819,619	
4.	Annual Salaries of Active Firefighters:	3,073,292	✓
5.	Recommended Minimum Contribution from the City:	1,434,173	✓
	Contribution Percentage:	44.87%*	-

Statutory Minimum Contribution

1.	Projected Unit Credit Normal Cost:	\$ 874,394	
2.	Unfunded Actuarial Accrued Liability (or Surplus):	9,419,045	
3.	Actuarial Value of Assets:	34,819,619	
4.	Annual Salaries of Active Firefighters:	3,073,292	
5.	Statutory Minimum Contribution from the City:	957,165	✓
	Contribution Percentage:	29.95%*	

* Projected for the fiscal year ending April 30, 2018.

SUMMARY OF SPECIFIC VALUATION RESULTS

	<u>Number</u>	<u>Actuarial Present Value of Projected Benefits</u>	<u>Entry Age Normal Cost</u>	<u>Projected Unit Credit Normal Cost</u>
1. Active Firefighters:	49			
Retirement Pension:		\$17,867,490	\$500,193	\$861,294
Survivors Pension:		458,480	23,745	24,789
Disability Pension:		3,722,535	215,027	178,115
Withdrawal Pension:		139,765	14,296	10,196
TOTAL ...	49	\$22,188,270	\$753,261	\$874,394
2. Inactive Firefighters and Survivors:				
Normal Retirees:	38	\$23,658,414		
Widows (Survivors):	20	4,723,963		
Children (Survivors):	0	0		
Disabled Retirees:	2	1,171,498		
Deferred Vested:	0	0		
Terminated/Separated:	<u>3</u>	<u>40,888</u>		
TOTAL	63	\$29,594,763		

**SUMMARY OF SPECIFIC VALUATION RESULTS
(Continued)**

RECOMMENDED
SMT APPROX MAY

Projected Unit Credit (PUC)

3.	Total Actuarial Present Value of Projected Benefits:	\$51,783,033	N/A
4.	Actuarial Present Value of Future Normal Costs:	6,606,805	N/A
5.	Actuarial Accrued Liability: [(3) - (4)]	45,176,228	44,238,664
6.	Actuarial Value of Assets:	34,819,619	34,819,619
7.	Unfunded Actuarial Accrued Liability (or Surplus): [(5) - (6)]	10,356,609	9,419,045
8.	Funded Ratio Percentage: [(6) ÷ (5)] x 100	77.08%	78.71%

HISTORY OF FUNDED PERCENTAGES

For the Year beginning May 1	EAN		PUC	
	Valuation Assets	Accrued Liabilities	Accrued Liabilities	Funded Percentage
2017	\$34,819,619	\$45,176,228	\$44,238,664	78.71%
2016	34,056,687	43,643,611	42,681,219	79.79%
2015	33,621,879	42,853,632	41,852,877	80.33%
2014	32,462,908	38,892,500	37,780,055	85.93%
2013	30,973,489	36,687,670	35,389,710	87.52%
2012	29,709,123	35,357,237	34,090,940	87.15%

DEVELOPMENT OF RECOMMENDED MINIMUM CITY CONTRIBUTION

	Fiscal Year May 1, 2017 through <u>April 30, 2018</u>
1. Entry Age Normal Cost:	\$753,261
Interest to April 30, 2018:	<u>52,728</u>
(a) Total	\$805,989
(b) 17½% of Projected Payroll	537,826
(c) Minimum Cost Payable, greater of (a) and (b):	\$805,989
2. Recommended Minimum Payment to Amortize 100 % of the Entry Age Normal Unfunded Accrued Liability as a level dollar amount over 23.00068 Years from May 1, 2017:with interest to April 30, 2018 :	918,764 ✓
3. Credit for Surplus:	0
4. Initial Recommended Minimum Contribution for Fiscal Year 2018: [(1) + (2) + (3)]	1,724,753
5. <u>Statutory Minimum Contribution</u> (Exhibit 3B line 4)	<u>1,247,745</u> ✓
6. Total Recommended Minimum Contribution for Fiscal Year 2018: [Greater of Line 4 and Line 5]	1,724,753
7. Active Member Contributions (9.455% of Salaries):	290,580
8. Net Recommended Minimum City Contribution: [(6) - (7)]	1,434,173 ✓

**DEVELOPMENT OF STATUTORILY REQUIRED CITY CONTRIBUTION
(NOTE THAT THIS CONTRIBUTION CALCULATION IS NOT RECOMMENDED)**

	Fiscal Year May 1, 2017 through April 30, 2018
1. Projected Unit Credit Normal Cost:	\$874,394
Interest to April 30, 2018:	<u>61,208</u>
(a) Total	\$935,602
(b) 17½% of Projected Payroll	537,826
(c) Minimum Cost Payable, greater of (a) and (b):	\$935,602
2. Minimum Payment to Amortize 90% of the Projected Unit Credit Unfunded Accrued Liability as a <u>level percentage of payroll</u> over 23.00068 Years from May 1, 2017 with interest to April 30, 2018:	312,143
3. Credit for Surplus:	0
4. Total Statutorily Required Contribution for Fiscal Year April 30, 2018: [(1) + (2) + (3)]	<u>1,247,745</u>
5. Active Member Contributions (9.455% of Salaries):	290,580
6. Statutorily Required City Contribution: [(4) - (5)]	957,165

MIN 90%

**RECONCILIATION OF THE CHANGE
IN THE RECOMMENDED MINIMUM CITY CONTRIBUTION**

1. Recommended Minimum Contribution for Year ending 4/30/2017:	\$1,343,021
2. Increase in Normal Cost and Amortization Payment due to anticipated pay changes:	48,224
3. Increase/(Decrease) in Normal Cost resulting from actual pay changes:	(4,052)
4. Effect of Asset Smoothing:	70,954
5. Increase/(Decrease) resulting from changes in assumptions:	0
6. Increase/(Decrease) resulting from other demographic and financial sources (retirements, deaths, new entrants, salary changes, etc.):	(23,974)
7. <u>Recommended Minimum Contribution for Year ending April 30, 2018:</u>	\$1,434,173

ANNUAL REQUIREMENT

\$ 1,247,745

**DERIVATION OF EXPERIENCE GAIN (LOSS) AND COST METHOD CHANGE
AS OF MAY 1, 2017**

1.	EANC Unfunded Actuarial Accrued Liability at 5/1/2016:	\$9,586,924
2.	Entry Age Normal Cost due at 5/1/2016:	727,547
3.	Interest on (1) and (2) to May 1, 2017 (at 7.00% per year):	722,013
4.	Contributions made for the prior year with interest to May 1, 2017:	1,255,526
5.	Expected EANC Unfunded Actuarial Accrued Liability at May 1, 2017 Before Assumption Changes [(1) + (2) + (3) - (4)]:	9,780,958
6.	Change in EANC Unfunded Actuarial Accrued Liability due to Assumptions Change at May 1, 2017:	0
7.	Expected Unfunded Actuarial Accrued Liability at May 1, 2017 [(5) + (6)]:	9,780,958
8.	Actual EANC Unfunded Actuarial Accrued Liability at May 1, 2017:	10,356,609
9.	Gain (Loss) for the prior Plan Year [(7) - (8)]:	<u>\$ (575,651)</u>

The experience gain (loss) reported above is the net result of the following:

1.	<u>FINANCIAL SOURCES</u>	
	a) Investment experience (based upon market value of assets):	\$ 753,595
	b) Contribution experience:	(418,458)
	c) Benefit Payments experience:	129,766
	d) Salary increases (greater)/lower than expected:	<u>14,317</u>
	Total from Financial Sources:	479,220
2.	<u>DEMOGRAPHIC SOURCES</u>	
	Mortality, retirement, disability, termination, etc.:	(255,054)
3.	<u>ACTUARIAL ADJUSTMENTS</u>	
	Market value adjustment for asset smoothing, including expenses	(799,817)
4.	<u>GAIN (LOSS) ALL SOURCES</u>	
	Total Gain (Loss) for the prior Plan Year [(1) + (2) + (3)]:	<u>\$ (575,651)</u>

SUMMARY OF DEMOGRAPHIC INFORMATION AS OF MAY 1, 2017

	<u>Number</u>	Projected Annual Salaries (Fiscal Year 2018)
Active Firefighters:	49	\$3,073,292

	<u>Number</u>	Total <u>Monthly Benefits</u>
Normal Retirees:	38	\$157,178
Survivors (Widows):	20	49,388
Survivors (Children):	0	0
Disabled Retirees:	2	6,273
Deferred Vested:	0	0
Terminated/Separated:	3	40,888 *

* Return of Contributions

AVERAGE AGE OF ACTIVE EMPLOYEES

41.77

AVERAGE SERVICE OF ACTIVE EMPLOYEES

12.73

AVERAGE ANNUAL COMPENSATION

\$62,720

The actuarial valuation was performed as of May 1, 2017 to determine contribution requirements for fiscal year ending April 30, 2018.

ASSET INFORMATION

According to the information provided by the Annual Filing with the Department of Insurance the following is provided:

Net Present Assets at Market Value	\$33,835,117
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The development of the Actuarial Value of Assets is shown in Exhibit 5-B

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	Item	Amount	Timing	Weight for Amount	Weighted Amount
1.	Market Value of Assets, May 1, 2016				\$ 32,272,368
2.	Actual Income and Disbursements in prior year weighted for timing				
	Contributions Received During 2016-2017	1,216,497		50.00%	608,248
	Miscellaneous Revenue	168		50.00%	84
	Benefit Payments and Expenses Made During 2016-2017	2,617,546		(50.00)%	(1,308,773)
	Total				(700,440)
3.	Market Value of assets adjusted for actual income disbursements [(1) + 2(d)]				31,571,928
4.	Assumed rate of return on plan assets for the year				7.00%
5.	Expected return on assets [(3) x (4)]				2,210,035
6.	Market Value of Assets, May 1, 2016*				32,272,368
7.	Income (less investment income) for prior year				1,216,497
8.	Disbursements paid in prior year				2,617,546
9.	Market Value of Assets, May 1, 2017				\$33,835,117
10.	Actual Return [(9) + (8) - (7) - (6)]				2,963,630
11.	Investment Gain/(Loss) for Prior Year [(10) - (5)]				753,595

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS
(Continued)

12. Market Value of Assets, May 1, 2017:				\$33,835,117
13. Deferred investment gains and (losses) for last 4 years:				
	<u>Plan Year Beginning</u>	<u>Gain/(Loss)</u>	<u>Percent Deferred</u>	<u>Deferred Amount</u>
a)	2017	\$ 753,595	80%	\$ 602,876
b)	2016	\$ (2,817,271)	60%	\$ (1,690,363)
c)	2015	\$ (236,846)	40%	\$ (94,738)
d)	2014	\$ 988,615	20%	\$ 197,723
e)	Total	\$ (1,311,907)		\$ (984,502)
14. Actuarial value of plan assets for funding, May 1, 2017: Item (12) less item 13(e):				\$ 34,819,619

Notes: The calculated value is determined by adjusting the market value of assets to reflect investment gains and losses (the difference between the actual investment return and the expected investment return) during each of the last five years at the rate of 20% per year.

ANALYSIS OF INVESTMENT RETURN

<u>Fiscal Year Ending April 30</u>	<u>Annual Rate of Return</u>
2017	8.98%
2016	(1.80)
2015	5.91
2014	10.74
2013	10.33
2012	4.31
2011	12.27
2010	18.40
 <u>Composite</u>	
2010-2017	8.50%

THIRTY - YEAR PROJECTION OF PAYMENTS

Year	Termination		Payouts from Active Group Upon		Retirement	Disability	Payouts from		Total
	Lump Sum	Deferred Pension	Death	Retirement			Retired Group	Deferred Pensioners	
2017	1,676	0	11,144	147,860	28,425	2,554,078	40,888	2,784,071	
2018	1,937	0	13,556	290,743	52,344	2,530,469	0	2,889,049	
2019	1,945	0	13,661	429,819	73,253	2,497,926	0	3,016,604	
2020	1,702	0	15,636	549,625	95,218	2,465,077	0	3,127,258	
2021	1,259	0	19,898	657,244	114,741	2,425,095	0	3,218,237	
2022	945	0	22,005	744,350	129,543	2,381,422	0	3,278,265	
2023	185	0	25,072	827,280	142,959	2,334,380	0	3,329,876	
2024	0	0	26,516	896,251	156,388	2,284,277	0	3,363,432	
2025	0	0	28,395	956,921	170,710	2,231,422	0	3,387,448	
2026	0	0	29,614	1,006,845	185,243	2,176,083	0	3,397,785	
2027	0	0	31,512	1,052,478	200,691	2,118,665	0	3,403,346	
2028	0	0	33,274	1,096,866	217,244	2,059,690	0	3,407,074	
2029	0	0	35,019	1,151,340	234,603	1,999,386	0	3,420,348	
2030	0	0	36,855	1,215,877	252,356	1,937,806	0	3,442,894	
2031	0	0	38,478	1,268,559	270,917	1,875,063	0	3,453,017	
2032	0	0	40,262	1,340,337	290,237	1,810,979	0	3,481,815	
2033	0	0	41,855	1,420,140	309,294	1,745,199	0	3,516,488	
2034	0	0	43,608	1,508,419	327,974	1,677,902	0	3,557,903	
2035	0	0	45,144	1,573,831	350,216	1,609,115	0	3,578,306	
2036	0	0	46,747	1,640,199	368,589	1,538,652	0	3,594,187	
2037	0	0	48,204	1,718,061	388,139	1,466,356	0	3,620,760	
2038	0	0	49,439	1,815,438	409,262	1,391,875	0	3,666,014	
2039	0	0	50,771	1,908,647	429,928	1,314,834	0	3,704,180	
2040	0	0	51,566	1,983,074	450,791	1,235,471	0	3,720,902	
2041	0	0	52,772	2,047,432	467,614	1,154,292	0	3,722,110	
2042	0	0	53,069	2,104,578	488,314	1,071,593	0	3,717,554	
2043	0	0	53,972	2,161,550	505,685	987,878	0	3,709,085	
2044	0	0	53,698	2,210,879	522,828	903,810	0	3,691,215	
2045	0	0	54,176	2,251,619	531,776	820,119	0	3,657,690	
2046	0	0	53,389	2,279,000	541,367	737,570	0	3,611,326	

ACTUARIAL ASSUMPTIONS

(Economic)

Investment Return

7.00% per annum, compounded annually (net of expenses).

Salary Increases

Representative values of assumed salary increases are as follows:

<u>Age</u>	<u>Increase %</u>
25	4.8611
30	2.9848
35	2.0341
40	1.5239
45	1.3083
50	1.1846
55	1.1220

An additional inflation allowance of 2.00% per year is added to the above.

Payroll Growth

It was assumed that payroll will grow 4.00% per year.

Cost of Living Adjustments

It was assumed that the Consumer Price Index – Urban (CPI-U) would increase 2.00% per year

Actuarial Asset Basis

The actuarial value of assets recognizes future gains and losses based on a 5-year smoothed market method as prescribed by Statute.

In a 5-year smoothed market method, the current market value of assets is reduced (increased) for the current year and each of three succeeding years, by a portion of the gain/(loss) in market value during the prior year. Such gain/(loss) is determined as the excess/(deficit) of the current market value of assets over the market value of assets as of the prior year, increased to reflect interest at the actuarial rate and adjusted to reflect contributions and benefit payments during the prior year. The portion of such gain/(loss) by which the current market value of assets is reduced (increased) shall be 80% in the current year, 60% in the first succeeding year, 40% in the second succeeding year and 20% in the third succeeding year.

Additionally, in accordance with government accounting standards, the actuarial value of assets is adjusted to remove any contributions receivable on the reporting date.

Expenses

None assumed.

(Demographic)

Mortality

Active Lives

RP-2000 Combined Healthy Mortality Table (male) with blue collar adjustment projected by Scale BB to 2015. Five percent (5%) of deaths amongst active firefighters are assumed to be in the performance of their duty.

Non-Active Lives

RP-2000 Combined Healthy Mortality Table (male) with blue collar adjustment projected by Scale BB and with a 150% load for participants under age 50.

Termination

Illustrative rates of withdrawal from the plan for reasons other than death or disability are as follows:

<u>Age</u>	<u>Rate of Withdrawal</u>
20	.0397
25	.0250
30	.0146
35	.0079
40	.0042
45	.0029

It is assumed that terminated firefighters will not be rehired

Disability Rates

Incidence of disability amongst firefighters eligible for disability benefits:

<u>Age</u>	<u>Rate</u>
25	.0009
30	.0025
35	.0046
40	.0065
45	.0097
50	.0166
55	.0314

15% of disabilities amongst active firefighters are assumed to be in the performance of their duty.

Retirement Rates

Retirements are assumed to occur between the ages of 50 and 69 in accordance with the following table:

<u>Age</u>	<u>Rate of Retirement</u>	<u>Age</u>	<u>Rate of Retirement</u>
50	.19	60	.28
51	.12	61	.36
52	.04	62	.44
53	.06	63	.52
54	.09	64	.60
55	.12	65	.68
56	.15	66	.76
57	.19	67	.84
58	.22	68	.92
59	.25	69	1.00

(Additional)

Marital Status

85% of firefighters are assumed to be married.

Spouse's Age

Wives are assumed to be 3 years younger than their husbands.

Actuarial Cost Method

Projected Unit Credit for statutory minimum
Entry Age Normal for recommended and GASB reporting

SUMMARY OF PRINCIPAL PLAN PROVISIONS

Definitions

Tier 1 – For Firefighters first entering Article 4 prior to January 1, 2011

Tier 2 – For Firefighters first entering Article 4 after December 31, 2010

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

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

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

Pension (4-109)

Normal Pension Age

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

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

Normal Pension Amount

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

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

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

Annual Salary capped at \$106,800 increased yearly by the lesser of ½ of the Consumer Price Index- Urban (CPI-U) or 3%. Salary for valuations beginning in 2017 is \$112,408.42.

Minimum Monthly Benefit: \$1,159.27

Maximum Benefit Percentage: 75% of salary

Maximum Benefit Percentage: 75% of salary except line of duty.

**SUMMARY OF PRINCIPAL PLAN PROVISIONS
(Continued)**

Termination Pension Amount

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

<u>Years of Credited Service</u>	<u>Applicable Percentage</u>
10	15.0 %
11	17.6
12	20.4
13	23.4
14	26.6
15	30.0
16	33.6
17	37.4
18	41.4
19	45.6

Pension Increase

Non-Disabled

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

Tier 2 - The lesser of ½ of the Consumer Price Index- Urban (CPI-U) or 3% increase of the original pension amount after attainment of age 60, followed by an additional 3% of the original pension amount on each January 1 thereafter. For firefighters who retire after January 1, 1986, 3% increase of the original pension amount after attainment of age 55 for each year elapsed since retirement, followed by an additional 3% in each January thereafter.

For firefighters who retire prior to January 1, 1986, but after July 1, 1971, the 3% increase commences at age 60, and for firefighters who retire before July 1, 1971, the 3% increase commences at age 65.

Disabled

3% increase of the original pension amount after attainment of age 60, followed by an additional 3% of the original pension amount in each January thereafter.

Pension to Survivors (4-114)

Eligibility

Death of a firefighter:

- (1) on active duty as a result of any illness or accident;
- (2) on disability retirement;
- (3) on retirement with 20 years of service;
- (4) as a terminated member who has rights to a benefit at age 60; and
- (5) as a deferred pensioner.

**SUMMARY OF PRINCIPAL PLAN PROVISIONS
(Continued)**

Death Benefit

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

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

Depending upon the survival of the spouse, dependent children benefits may increase to a level of 20% of firefighter's salary.

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

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

Minimum Monthly Survivor Pension

Annual step rate increases from \$1,030.00 to \$1,159.27.

Maximum Survivor Pension

75% of such firefighter's salary.

Disability Pension - Line of Duty (4-110)

Eligibility

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

Pension

Greater of 65% of salary attached to rank at date of suspension or retirement and the retirement pension available.

Minimum Monthly Benefit: Annual step rate increases from \$1,030.00 to \$1,159.27.

For each dependent child under 18, an additional \$20 per month increased annually is granted each disabled member. Maximum total benefit is 75% of salary.

Disability Pension - Not on Duty (4-111)

Eligibility

Suspension or retirement from fire service for any cause other than while on duty. Member must have at least 7 years of credited service.

Pension

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

Disability Pension - Occupational Disease (4-110.1)

Eligibility

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

Pension

Same pension as in line of duty.

**SUMMARY OF PRINCIPAL PLAN PROVISIONS
(Continued)**

Disability Pension Option A (4-113(a))

Eligibility

Member receiving a disabled pension who attains age 50 and whose years of creditable service and years of disablement total 20 years.

Pension Option

Eligible for pension increase upon conversion to retirement. Pension amount remains the same at date of conversion but subject to annual pension increases.

Disability Pension Option B (4-113(b))

Eligibility

Member receiving disability pension who attains age 50 and who had 20 years of creditable service at date of disablement.

Pension Option

Convert to normal pension based upon years of service at disablement and salary attached to rank on date of election.

Other Provisions

Refund (4-116)

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

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

Contributions by Firefighters (4.118.1)

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

GLOSSARY

Actuarial Accrued Liability

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

Actuarial Assumptions

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

Actuarial Cost Method

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

Actuarial Funding Method

See *Actuarial Cost Method*

Actuarial Gain (Loss)

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

Actuarial Present Value

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

Actuarial Value of Assets

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

Asset Valuation Method

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

Employee Retirement Income Security Act of 1974 (ERISA)

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

**GLOSSARY
(Continued)**

Entry Age Normal Cost Method

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

Normal Cost

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

Present Value of Future Normal Costs

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

Present Value of Projected Plan Benefits

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

Projected Unit Credit Cost Method

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

Statement No. 25 of the Governmental Accounting Standards Board (GASB No. 25)

The accounting statement that established the standards of financial accounting and reporting for the financial statements of defined benefit pension plans.

Unfunded Actuarial Accrued Liability

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

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